

DE GRUYTER
MOUTON

Jakob Maché

HOW EPISTEMIC MODIFIERS EMERGE

TRENDS IN LINGUISTICS

DE
|
G

Jakob Maché
How Epistemic Modifiers Emerge

Trends in Linguistics Studies and Monographs

Editors

Chiara Gianollo

Daniël Van Olmen

Editorial Board

Walter Bisang

Tine Breban

Volker Gast

Hans Henrich Hock

Karen Lahousse

Natalia Levshina

Caterina Mauri

Heiko Narrog

Salvador Pons

Niina Ning Zhang

Amir Zeldes

Editor responsible for this volume

Volker Gast

Volume 292

Jakob Maché

How Epistemic Modifiers Emerge

DE GRUYTER
MOUTON

ISBN 978-3-11-040056-4
e-ISBN (PDF) 978-3-11-041102-7
e-ISBN (EPUB) 978-3-11-041112-6
ISSN 1861-4302

Library of Congress Control Number: 2018963772

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie;
detailed bibliographic data are available on the Internet at <http://dnb.dnb.de>.

© 2019 Walter de Gruyter GmbH, Berlin/Boston
Printing and binding: CPI books GmbH, Leck

www.degruyter.com

For Susanne Benesch

* 22th July 1898, Vilnius

† Spring 1940, Ravensbrück

But your seed has prospered . . .

Acknowledgements

The present book is a revised, updated and refined version of my dissertation, which was defended at the Freie Universität Berlin on 28th June 2013. A lot of people contributed in direct and indirect ways.

First of all, I would like to thank the Austrian and the German tax payers, without whose help it would have been impossible to pursue an extensive investigation such as the one presented here. The earlier parts of this work were funded by the *Österreichische Akademie der Wissenschaften* (Austrian Academy of Science), which supported me with a DOC grant from May 2005 to April 2007. The rest is the result of my research carried out at the Freie Universität Berlin from October 2007 to the Winter 2013. There are a couple of people who provided me with crucial support and to whom I am deeply indebted. First of all, I would like to thank Werner Abraham, who opened many doors to me that would have been remained closed otherwise, and Stefan Müller for being so trusting when he employed me as his research and teaching assistant. Further important facilitators are Ulrich Dressler and Richard Schrodtt.

Aside from that, there are a lot of other people who contributed to the present study by giving fruitful hints or criticism. Among the most important partners are my colleagues Tanyushichka Ackermann, Katrin Axel, Felix Bildhauer, Rui Chaves, Philippa Cook, Katarina Colomo, Hamida Demirdache, Kristin M. Eide, Serge Doitchinov, Markus Egg, Veronika Ehrich, Peter Eisenberg, Ophira Gamliel, Volker Gast, Remus Gergel, Jane Grimshaw, Nele Hartung, Roland Hinterhölzl, Anke Holler, Katalin Horváth, Łukasz Jędrzejowski, Olga Kellert, Ekkehard König, Zhanna Lipenkova, Claudia Maienborn, Amalia Mendes, Mingya Liu, Svetlana Petrova, José Pinto de Lima, Kilu von Prince, Uli Reich, Marga Reis, Eva-Maria Remberger, Roland Schäfer, Oliver Schallert, Mathias Schenner, Cosima Scholz, Horst Simon, Augustin Speyer, Hubert Truckenbrodt, Evdokia “the one and only” Valcheva, Heinz Vater, Rita Veloso, Hedde Zeijlstra, Chris Zimmer. I am particularly indebted to Fẹ́mi Adéwólé from the Ọ̀báfẹ́mi Awólówọ̀ University Ilé-Ifẹ̀ for sharing with me his unique expertise on modal verbs in Yorùbá.

Furthermore, I am grateful for the comments and hints given by Anastasios Tsangalidis, Hardarik Blühdorn, Jonathan Ginzburg, Joachim Jacobs and Horst Lohenstein and possibly many more. Finally, I would like thank Konstantin Krasuchin for the fruitful discussions.

Moreover, I would like to thank those native speakers of English who helped me with the multiple proof-readings of this 530 pages long monster. In particular, Erica Haas, Philippa Cook, Kevin Ryan and Natalie Adams. Yet, above all, I am grateful to Volker Gast, the editor of this series, who over many months and years

<https://doi.org/10.1515/9783110411027-201>

invested so much time to personally proof-read the whole manuscript for another time. In addition, Till Kulawik deserves special thanks for helping me with analysing the data from Latin.

Apart from that, there are a couple of people who helped me to bring various research visits to fruition. At this point I would like to thank Elisabeth Leiss and Christiane Wanzeck for supporting me on my visit at the *Ludwig-Maximilians-Universität München* in September 2005, Marga Reis for hosting me at the *Sonderforschungsbereich 441 Linguistische Datenstrukturen* at the *Universität Tübingen* in the years 2005/2006, Amalia Mendes and Ana Maria Martins for my stay at the *Centro de Linguística da Universidade de Lisboa* in 2006, and Hamida Demirdache for my stay at the *Laboratoire Linguistique de Nantes* at the *Université de Nantes* in May 2007.

I am particularly indebted to Viola Auermann, who supported me in many difficult situations and who enabled me to deliver this thesis on time.

Finally, I owe Nita Little, Nancy Stark Smith and Steve Paxton a great debt of gratitude for their revolutionary inventions. And last but not least, I am grateful to the Estádio do Luz for providing me with divine insights from 2007. And to my bicycle, which carried me through Berlin every day, altogether more than 40.000 kilometres.

Contents

Acknowledgements — V

List of Tables — XI

Abbreviations — XIII

1 Introduction — 1

- 1.1 Aims — 1
- 1.2 Method — 1
- 1.3 Theoretical considerations — 3
- 1.4 Results in a nutshell — 4

2 Modal verbs: A class struggle — 8

- 2.1 Traditional criteria — 9
 - 2.1.1 Morphological criteria — 9
 - 2.1.2 Syntactic criteria — 20
 - 2.1.3 Semantic criteria — 25
 - 2.1.4 Conclusions — 33
- 2.2 Case studies — 37
 - 2.2.1 *können* — 38
 - 2.2.2 *müssen* — 75
 - 2.2.3 *wollen* — 95
 - 2.2.4 *dürfen* — 113
 - 2.2.5 *dürfte* — 122
 - 2.2.6 *sollen* — 129
 - 2.2.7 *mögen* — 147
 - 2.2.8 *möchten* — 165
 - 2.2.9 *brauchen* — 176
 - 2.2.10 *werden* — 220
 - 2.2.11 *scheinen* and *dünken* — 229
 - 2.2.12 *drohen*, *versprechen* and *verheißen* — 238
 - 2.2.13 Summary — 250
- 2.3 The origin of the term *Modalverb* — 256
 - 2.3.1 Early grammars: A morphological classification — 257
 - 2.3.2 Karl Ferdinand Becker (1836): From a morphological classification to a grammatical one — 260
 - 2.3.3 Blatz (1896) — 264

- 2.3.4 George O. Curme — 265
- 2.3.5 Braune, Paul and Behaghel: The decline of the semantic motivation — 266
- 2.3.6 Gunnar Bech (1949) — 268
- 2.3.7 The *Duden* grammar — 270
- 2.3.8 Summary — 273

3 The nature of epistemic modality — 280

- 3.1 Types of modification — 280
- 3.2 Circumstantial modal verbs as event modifiers — 286
- 3.3 The case of *can* — 287
- 3.4 Ambiguities across categories — 289
 - 3.4.1 Conditionals — 289
 - 3.4.2 Causal clauses — 294
 - 3.4.3 Causal *wo*-clauses — 298
 - 3.4.4 Corrective uses of *obwohl*, *wobei* and *wiewohl* — 299
 - 3.4.5 Contrastive *während*-clauses — 301
 - 3.4.6 *so lange*-clauses — 302
 - 3.4.7 *bevor*-clauses — 303
 - 3.4.8 Final *damit*-clauses — 304
 - 3.4.9 Addressee-oriented free relative clauses — 306
 - 3.4.10 Adverbial infinitives — 306
 - 3.4.11 VP adverbs — 309
 - 3.4.12 Locative modifiers — 313
 - 3.4.13 *noch einmal* — 314
 - 3.4.14 Past operator — 317
 - 3.4.15 Meta-communicative *why* — 318
 - 3.4.16 Declarative questions — 319
 - 3.4.17 Summary — 320
- 3.5 Ambiguities across languages — 323
- 3.6 Critical data — 329
 - 3.6.1 Quantificational modal verbs — 329
 - 3.6.2 Intensional subjects — 330
 - 3.6.3 Veronika Ehrich's counter example — 331
 - 3.6.4 Summary — 333

4 Twenty-one commandments for epistemic modality — 334

- 4.1 No infinitives — 338
- 4.2 No past participle — 342
- 4.3 No past tense — 348

- 4.4 Excluded from the scope of a counterfactual operator — **355**
- 4.5 Excluded from nominalisations — **357**
- 4.6 No verbless directional phrase complements — **360**
- 4.7 No VP-anaphora — **361**
- 4.8 No separation in *wh*-clefts — **364**
- 4.9 May not bear sentence accent — **368**
- 4.10 Excluded from the scope of negation — **372**
- 4.11 Excluded from polarity questions — **380**
- 4.12 Excluded from *wh*-questions — **389**
- 4.13 Excluded from imperatives — **395**
- 4.14 Excluded from optatives — **396**
- 4.15 Excluded from complement clauses — **398**
- 4.16 Excluded from event-related causal clauses — **415**
- 4.17 Excluded from the antecedent of an event-related conditional — **425**
- 4.18 Excluded from temporal clauses — **433**
- 4.19 Excluded from restrictive relative clauses — **441**
- 4.20 Excluded from the scope of a quantifier — **444**
- 4.21 No assent/dissent — **459**
- 4.22 Objective and subjective epistemic modality: A reassessment — **460**
 - 4.22.1 Lyon's original motivation — **461**
 - 4.22.2 Further advancements in the study of 'objective' epistemic modality — **466**
 - 4.22.3 The role of public evidence — **469**
 - 4.22.4 Objective epistemic modal verbs do not constitute a consistent class — **470**
 - 4.22.5 'Objective' modal verbs that are practical possibility or quantificational modal verbs — **475**
 - 4.22.6 'Objective' epistemic modal verbs that are 'subjective' — **476**
 - 4.22.7 Conclusions — **478**
 - 4.23 Summary — **480**
- 5 Reportative and evidential modal operators — 484**
 - 5.1 Reportative *wollen* and *sollen* — **484**
 - 5.1.1 Infinitives — **485**
 - 5.1.2 Past participles — **488**
 - 5.1.3 Nominalisations — **489**
 - 5.1.4 Optatives — **491**
 - 5.1.5 Past tense — **491**

- 5.1.6 Questions — 495
- 5.1.7 Event related conditional clauses — 499
- 5.1.8 Summary — 500
- 5.2 So-called ‘evidentials’ *drohen*, *versprechen* and *scheinen* — 502
- 5.2.1 Past participles — 502
- 5.2.2 Event related conditional clauses — 509
- 5.2.3 Past tense — 512
- 5.2.4 Summary — 515

6 Anchoring the deictic centre — 517

- 6.1 The speaker, the addressee and arguments — 517
- 6.1.1 Declarative speech acts — 518
- 6.1.2 Interrogative speech acts — 518
- 6.1.3 Complement clauses — 519
- 6.1.4 Reportative modal verbs — 520
- 6.1.5 Summary — 521
- 6.2 The deictic centre — 521
- 6.2.1 The modal source — 522
- 6.2.2 The Condition on Deictic Centres — 523
- 6.2.3 A subtle refinement — 529
- 6.3 A unified analysis for epistemic and reportative modality — 532
- 6.3.1 Hierarchy of Saliency — 532
- 6.3.2 Operators which impose selectional restrictions — 533
- 6.4 Alternative analyses — 536
- 6.5 Summary — 539

7 On black magic: A diachronic explanation — 540

- 7.1 Epistemic modal verbs in Early New High German — 541
- 7.2 The Rule of Accommodation as a driving force of language change — 548
- 7.3 Summary — 549

8 Summary — 551

Primary sources — 555

References — 559

Author index — 577

Subject index — 583

List of Tables

Tab. 2.1	Preterite present origin of <i>wissen</i> – the Old High German paradigm — 10
Tab. 2.2	Modal verbs and preterite present morphology — 12
Tab. 2.3	Most frequent verbs in spoken German, according to Ruoff (1981), based on a corpus study comprising 500,000 word form tokens — 36
Tab. 2.4	Frequency of auxiliaries among all word form tokens, according to Kaeding (1897), based on a corpus study comprising 10,910,777 word form tokens — 37
Tab. 2.5	Complement types of potential modal verbs — 254
Tab. 2.6	Different extensions of the term <i>Modalverb</i> accros the centuries — 274
Tab. 2.7	Features relevant for a definition of the class <i>Modalverb</i> — 279
Tab. 4.1	Epistemic modal verbs in non-canonical enviroments — 474
Tab. 4.2	Anchoring of epistemic modal operators in embedded contexts — 481
Tab. 7.1	Circumstantial modal verbs with stative complements – in Schmid’s <i>Neuwe Welt</i> (1567) — 545

<https://doi.org/10.1515/9783110411027-203>

Abbreviations

The abbreviations employed in the glossed examples correspond to those found in the Leipzig Glossing Rules.¹ Additional tags used in the glossed examples are listed below:

CAUS	causative
COMP	comparative
COR	correlate
DIM	diminutive
GER	gerundive
INTN	intensifier
PART	particle
PPP(ge)	past participle with <i>ge</i> -prefix
PPP(ipp)	past participle with <i>infinitivus pro participio</i> -morphology
SUP	superlative
VPAN	VP anaphora

¹ The Leipzig Glossing Rules can be found at the following web site (last access 18th August, 2018): <http://www.eva.mpg.de/lingua/resources/glossing-rules.php>

<https://doi.org/10.1515/9783110411027-204>

1 Introduction

1.1 Aims

The primary aim of this investigation is to provide an analysis of the development of epistemic modal verbs in German. As Abraham (2002: 24) and Mortelmans, Boye and Auwera (2009) have illustrated, German has a particularly rich system of modal verbs, with a much richer morphology than is found in English. As has been shown by numerous investigations, such as Traugott (1989: 35), Öhlschläger (1989: 133), Sweetser (1990), Bybee, Perkins and Pagliuca (1994: 195), Fritz (1997), Diewald (1999) and Axel (2001: 45), the epistemic modal verbs of German developed diachronically from circumstantial modal verbs. However, the details of this development are not entirely clear, and figuring them out is no trivial matter. In order to tackle this issue, a couple of related questions have to be addressed beforehand.

The first question that arises concerns the nature of the so-called *modal verbs*: How can these verbs be characterised? Is there a way to delimit them from other verbs? As will be shown, the availability of an epistemic interpretation plays an essential role for the classification of modal verbs. This raises another issue that has to be addressed regarding the nature of epistemic modality: How does epistemic modality differ from circumstantial modality? Are there environments in which epistemic modal verbs are used while their circumstantial counterparts are ungrammatical? Are there configurations in which epistemic modal verbs cannot occur while circumstantial modal verbs can? How can the distributional differences between epistemic modal verbs and circumstantial modal verbs be accounted for (if there are any)? Once it is clear what the precise nature of epistemic modality is, it will be possible to address the major question: What circumstances triggered the development of epistemic modal verbs?

Summing up, the present investigation intends to provide answers to the following central questions:

1. What is the nature of modal verbs?
2. What is the nature of epistemic modifiers?
3. What triggered the development of epistemic modal verbs?

1.2 Method

The use of modal verbs is one of the most extensively investigated phenomena in German. Accordingly, the number of descriptions and analyses is vast. However,

<https://doi.org/10.1515/9783110411027-001>

most of these accounts date from a period when no comprehensive electronic corpora were available. As a consequence, the large majority of previous investigations are based on very small sets of empirical data. Frequently, the data was obtained through introspection, a method which is not considered reliable anymore in contemporary linguistics. Moreover, a lot of analyses are based on scarce authentic data. Very often, the decisive examples on which the relevant theories are based involve configurations which are somewhere in the twilight zone of grammaticality and, thus, difficult to evaluate. In approaches that are supported by introspective data, such configurations are often judged as ungrammatical in the case of doubt. Yet, it often turns out that such allegedly ungrammatical configurations indeed exist if sufficiently large collections of texts are considered.

Summing up, there are countless analyses of modal verbs in German that are most often based on introspective rather than on authentic data. In most cases, the grammaticality judgements of the decisive examples are fairly contested. Accordingly, their status as evidence in support of theoretical analyses is not always obvious.

It is in this spirit that the present investigation provides selected data taken from the German Reference Corpus (*Deutsches Referenzkorpus – DeReKo*) composed and hosted by the *Institut für Deutsche Sprache* (IDS). At the time of investigation, i.e. during the years 2010–2012, it encompassed about 2 billion of word form tokens. A major contribution of this book is a systematic and thorough description of all potential modal verbs in German, which is well grounded on authentic data. Furthermore, all of the case studies will deliver a critical summary of the previous discussion on the respective verbs and refer to the most important approaches that have been published in the last century. In this way, the present investigation aims to provide an overview of previous accounts as well as a sound empirical foundation for future studies, rather than contributing another analysis that lacks the support of authentic data. This strategy may not appear very prestigious; however, the less spectacular way is often the more successful one.

As has been noted above, this study has a diachronic focus. Diachronic studies involve a comparison of at least two historically distinct stages of a language. In the present study, the first stage concerns the time before the so-called *modal verbs* had acquired their epistemic interpretations, and the second stage covers the period after the modal verbs had developed their epistemic interpretations. Assuming that the latter stage corresponds to the situation in present-day German, one stage can already be clearly identified. As Fritz (1991: 29), Fritz (1997: 9, 95) and Müller (2001) illustrate, the number of uses of epistemic modal verbs attested in documents significantly increases for texts from the 16th century. Correspondingly, it appears to be likely that the 16th century plays an important role in the development of epistemic modal verbs.

In order to arrive at reliable results, any diachronic investigation needs to collect as much information about the respective stages to be contrasted as possible. In the present case, there is a bias between the two stages to be investigated. For present-day German, native competence can still be accessed. In contrast, no speaker with native competence for Early New High German or Middle High German can be found anymore. For this reason, it appears to be most natural to gain as much information as possible about the language stage that can still be accessed. In order to entirely understand the nature of a diachronic change, it is necessary to know at least one stage in every detail. Yet, there was no satisfactory description of the potential modal verbs in German that was based on authentic data at the time when this investigation was started. It appeared necessary to establish such a description before a reliable diachronic comparison could be undertaken. A similar approach is taken by Krämer (2005: 1).

Moreover, the diachronic developments of a linguistic item are often reflected in the synchronic situation of a language. Ambiguous words often involve two or more variants that have arisen in different periods and that co-exist in the synchronic state. As Diwald (1999: 4) pointed out, that is exactly what applies to the ambiguity of modal verbs in German. Most modal verbs are ambiguous between transitive, circumstantial and epistemic uses and all of them have developed in different periods: The transitive was the source for the circumstantial patterns and the circumstantial patterns in turn constituted the basis for the epistemic uses. As the diachronic development of epistemic modal verbs is partially reflected in the synchronic state, we can learn a lot by investigating data from present day German. Accordingly, the investigation outlined here focusses on synchronic data and takes into account data from earlier periods whenever this provides relevant insights. In addition to that, grammars from the 17th and 18th centuries have been investigated to deepen the knowledge of the nature of the potential modal verbs in earlier stages.

Finally, it will be argued that the German term *Modalverb* is misleading and inconsistent. In order to discover the source of these inconsistencies, the history of the term will be meticulously investigated across grammars from the 17th century up until the most recent decades.

1.3 Theoretical considerations

Any theory is a model of reality. A theoretical model is the more successful the more it resembles reality. In linguistic theories, a particular language L is generally considered as the set of all grammatical sentences that can theoretically be uttered in this language. A perfect theoretical description of that language L yields

the set that contains all those sentences that are judged as grammatical by the speakers of that language, and none that are judged as ungrammatical. As easy as it sounds, the way to the perfect description quickly turns out to be barred by uncountable dangerous obstacles paved with insidious traps – and sometimes, fallacious notions will mislead the eager scholar.

In accordance with these prerequisites, the present investigation attempts to formulate a theory that captures as many uses of the so-called *modal verbs* in German as possible. It aims to cover of all the uses of the different (so-called) modal verbs that have hitherto been discussed in the literature and that can be found in corpora.

In some of the more recent accounts, e.g. in usage-based theories, the grammaticality of a linguistic structure is occasionally related to its frequency in corpora. As these theories sometimes conclude, patterns that do not occur frequently are grammatical to a lesser extent, or not grammatical at all, and as a consequence, such uses can be neglected. Yet, frequency is not everything. Among rare linguistic structures, there are some that are regarded as deviant by the majority of the speakers of that language, but there are also instances that are considered as fully grammatical. In the latter case, the low frequency of a structure must obviously be due to some reason other than a failure to produce utterances of the relevant types.

1.4 Results in a nutshell

Based on the three questions formulated in Section 1.1, the investigation of the corpus data has yielded the following results. As will be shown in Chapter 2, the term *modal verb* as used traditionally is not consistent. First of all, no characteristic could be found that separates the six traditional modal verbs, *können* ‘can’, *müssen* ‘must’, *wollen* ‘want’, *dürfen* ‘be allowed to’, *sollen* ‘shall’ and *mögen* ‘may’ from the remaining verbs in German. Furthermore, each of these verbs has turned out to behave in a very idiosyncratic manner. This illustrates that the traditional six modal verbs do not form a natural class, even if they exhibit some degree of undeniable kinship. The term *modal verb* as used traditionally suggests that its class members are characterised by two properties: They exhibit a morphological anomaly, and they fulfil the same function in grammar. Yet, the set of verbs with morphological anomalies and the set of verbs that denote a necessity or possibility are not co-extensive. Accordingly, the most efficient solution is to refrain from using the traditional term *modal verb*, and to restrict the focus to the epistemic patterns. In doing so, the extension of the class becomes larger, as it also includes verbs that

are not traditionally considered as modal verbs, e.g. *werden* ‘will, FUT.AUX’ and *brauchen* ‘need’. A similar approach has been taken by Reis (2001: 308, 2005).

As it turns out, the epistemic uses of the verbs considered here constitute a natural class of verbs in German in formal and functional respects: They select bare infinitive complements and they can encode epistemic modality. It is reasonable to assume that these two properties are closely related to each other. As can be seen, the ‘ideal’ epistemic modal verb in German selects bare infinitive complements, and any verb that is about to acquire an epistemic interpretation has to lose its infinitive particle *zu* first. If the availability of an epistemic interpretation becomes the decisive property, the extension of the class has to be adapted. The class of epistemic modal verbs thus encompasses the following items: *kann*, *könnte*, *muss*, *müsste*, *sollte*, *dürfte*, *mag*, *braucht nicht*, and *wird* ‘will’. Due to the high number of idiosyncrasies that these verbs exhibit in their non-epistemic patterns, an analysis that is capable of capturing all these fine-grained differences is needed. It requires a lexicon that can differentiate between all the syntactic differences that the different potential modal verbs exhibit. For such an endeavour, a lexicalist account such as Head-Driven Phrase Structure Grammar seems to be the most promising one.

As the availability of epistemic modality plays a crucial role in the classification of the verbs investigated here, it becomes necessary to understand its precise nature. As will be shown, there are characteristic contrasts between epistemic modal verbs and their circumstantial counterparts. Chapter 3 focusses on the environments in which only epistemic modal verbs are grammatical whereas their circumstantial cognates are ruled out. It will be pointed out that circumstantial modal verbs are event modifiers and, as a consequence, they are restricted to the selection of predicates that can be interpreted as events. By contrast, epistemic modal verbs can also embed predications about an identified subject referent, headed by a predicate denoting a state that cannot be altered, or that refers to an event in the past. Accordingly, they have to be considered as propositional or speech act modifiers.

Chapter 4 is dedicated to the contexts from which epistemic modal verbs are excluded while their circumstantial counterparts are fully grammatical. These non-canonical environments for epistemic modal verbs play an important role in their characterisation. In the present study, the twenty-one most important environments will be thoroughly checked against corpus data. As will be shown, more than half of them are fallacious, as they are attested with epistemic modal verbs. There are only eight environments in which epistemic modal verbs could not be found: (i) They do not occur with verbless directional phrase complements, (ii) they cannot be separated from their infinitive complements in *wh*-clefts, (iii) they do not undergo nominalisation, (iv) they are exempt from adverbial infinitives

and, finally, they cannot be embedded under (v) circumstantial modal verbs, (vi) predicates of desire, (vii) imperative operators or (viii) optative operators. This conclusion is very similar to the one reached by Eide (2005: 9) for Norwegian. As the contexts (iv)–(viii) contribute some sort of circumstantial modal operator, the majority of the non-canonical environments can be accounted for in terms of intervention. Epistemic modal operators cannot occur in the scope of circumstantial modal operators. Furthermore, the corpus study has revealed that the assumption of a distinct ‘objective’ epistemic interpretation, as proposed by Lyons (1977: 799), is misleading.

In Chapter 5, it will be shown that reportative uses of *wollen* and *sollen* differ substantially from epistemic modal verbs. More specifically, they are more flexible with respect to the contexts in which they can occur. Unlike epistemic modal verbs, they are attested in nominalisations, adverbial infinitives, optatives and embedded under the future auxiliary *werden*. Furthermore, it will be pointed out that they obtain a different interpretation whenever they are embedded under a past operator. By contrast, it turns out that the so-called *evidential verbs* *scheinen*, *drohen*, *versprechen* and *verheißten* belong to a different type of pattern.

In Chapter 6, it will be demonstrated how the behaviour of epistemic modal verbs and reportative modal verbs in non-canonical environments can be analysed. The analysis is based on a couple of assumptions. The most basic assumption is that epistemic operators contribute a variable for the deictic centre. In order to be interpreted, this variable needs to be locally bound by an appropriate attitude holder. In the canonical case for epistemic modal verbs, the variable is identified with the most salient referent of the speech act, usually the speaker. While in the case of epistemic modal verbs the variable is only instantiated at the speech act level, the variable is anchored in a very local configuration with reportative modal verbs: it is bound to an argument of the modal verb itself. As there are operators which fail to embed linguistic structures containing unbound variables for the deictic centres, such as circumstantial modal operators, epistemic modal verbs cannot occur in the scope of such operators, since their variable for the deictic centre is left unspecified. By contrast, reportative modal verbs are acceptable in such environments. This explains why reportative modal verbs can occur embedded in configurations in the scope of certain modal operators such as adverbial infinitives or optatives, whereas epistemic modal verbs are banned from such environments. According to this, epistemic modal verbs can be regarded as elements of the category ‘verb’, as their incompatibility with non-canonical environments results from the status of the variable which they introduce. Moreover, it will be demonstrated that approaches in the tradition of Cinque (1999), which analyse modal verbs as functional categories, face serious challenges when intending to account for the data presented here. It appears that only lexicalist ac-

counts such as HPSG are capable of providing an analysis that is empirically well supported.

Finally, the insights from the investigation of the epistemic modal verbs in contemporary language use put us in a position to reconstruct a scenario of how these modifiers came into existence. Chapter 7 is dedicated to the grammaticalisation of epistemic modal verbs. As has been observed by Abraham (1991), Abraham (2001) and Abraham (2005) as well as Leiss (2002), among the earliest uses of epistemic modal verbs there are many that select stative or other imperfective predicates. This can be related to the findings of Chapter 3, where it is shown that circumstantial modal verbs are event modifiers, which are restricted to the modification of predications that involve (Davidsonian) event arguments. Following Maienborn (2003: 106), Kimean state predicates, such as the copula in German, do not contribute an event argument. Yet, in Old and Middle High German instances of circumstantial modal verbs can already be found that embed the copula *sein*. This situation is unexpected if circumstantial modal verbs are indeed restricted to the selection of predicates that involve an event argument. But as Maienborn (2003: 178, 193) argues, there are two pragmatic repair mechanisms which can render an event argument to a predicate that would otherwise lack such an argument: The temporariness effect, and the agentivity effect. Likewise, Kratzer (1981: 61) argues that there are pragmatic mechanisms of coercion and accommodation that can adapt complements not fulfilling the selectional restriction. As she remarks, this mechanism “is black magic, but it works in many cases”.

However, this mechanism is not always easy to detect, especially for L1 learners. In the course of history, there was one generation of L1 learners who were no longer able to decode this repair mechanism. Rather, they reinterpreted the utterance in a more economic way. Since epistemic modal verbs are not restricted to predicates that provide an event argument, they do not require the temporariness effect or the agentivity effect to apply. As circumstantial possibility verbs and epistemic possibility verbs sometimes obtain almost the same communicative effect, this scenario of reinterpretation seems very likely.

These results indicate that the grammaticalisation of epistemic modal verbs is, in essence, a change from event modification to clausal modification, and a process which leaves the original category of the grammaticalised element unaffected.

2 Modal verbs: A class struggle

Modal verb is probably one of the most common terms in the contemporary description of German grammar, and it is used as if it had always been around. All of the major grammars of German employ this expression, cf. Engel (1996: 463), Zifonun (1997: 1253), Eisenberg (2004: 90), Helbig and Buscha (2001: 114) and Eisenberg et al. (2005). But what exactly does it mean? What is the benefit of using this term? The most common answer would be that this word refers to a group of six particular verbs, which, according to many, constitute a “relatively closed system” and are “part of a grammatical system of rules”, see Buscha, Heinrich and Zoch (1971: 7):

- (1) können, müssen, wollen, dürfen, sollen, mögen
can must want may shall like

And indeed, this corresponds exactly to what is taught in most schools in countries where German is spoken as a native language, and occasionally in institutions where it is taught as a second language.¹ As this answer is not very precise, further questions arise. What is the particularity of these six verbs? How do they differ from the remaining set of verbs? What makes them so special? Following the traditional view of Vernaleken (1861: 94), Bauer (1850: 102§166), Curme (1922: 317), Helbig and Buscha (2001) argue that being of preterite present origin, they exhibit a particular morphology, and that they select a bare infinitive and express modality. Accordingly, they constitute a relatively closed group. Furthermore, Helbig and Buscha (2001: 115) point out that modal verbs in German withstand passivisation, and their past participle is always realised with infinitive morphology (IPP-effect, *Ersatzinfinitiv*). In a similar vein, Griesbach and Schulz (1976: 34) highlight that modal verbs lack imperative morphology. Summing up, in these approaches modal verbs are characterised by morphological anomalies (preterite present origin, lack of an imperative, lack of a passive, IPP-effect), by the selection of a bare infinitive, and by their ability to express modality. Buscha, Heinrich and Zoch (1971) suggest a whole range of further criteria, but they are rather intuitive and do not withstand closer scrutiny. There are a couple of influential studies that are led by these assumptions, in particular that there is a class of modal verbs consisting of these six verbal lexemes. Among others, Bech (1949) and Bech (1951) and Diewald (1999) tried to provide a comprehensive description of the class of elements listed in (1).

¹ As Eva Valcheva (pers. commun.) reports, the very same concept of *modal verb* is taught in schools in Bulgaria as well.

In the next sections, the criteria suggested by Bech and Diewald will be carefully reviewed. None of them will prove to be reliable enough to justify the assumption of a homogeneous class containing the six items *können*, *müssen*, *wollen*, *dürfen*, *sollen* and *mögen*. Finally, I will arrive at the conclusion that the term *modal verb*, as it is most often employed in research on German grammar, is misleading.

2.1 Traditional criteria

As discussed above, there is some evidence that the six verbs in (1) constitute a separate class of verbs. What follows is a collection of the phenomena adduced by different proponents of the traditional perspective. This does not mean that all traditionalists agree about the exact number of characteristics of modal verbs. Curme (1922: 317), for instance, only briefly refers to the morphological anomaly of these verbs that is mainly due to their preterite present origin. Other authors, such as Helbig and Buscha (2001) and Griesbach and Schulz (1976), mention further morphological features and, in addition, syntactic peculiarities. It is not always the case that each author was aware of the explanatory power of other potential criteria. The most promising of these potential characteristics will be discussed in the upcoming sections.

2.1.1 Morphological criteria

There are two morphological anomalies that can be found among the six traditional modal verbs: an inflectional pattern which is typical of preterite presents and the *infinitivus pro participio* (IPP-effect). Finally, the lack of an independent imperative form will be discussed. Some authors, e.g. Redder (1984: 305), argue that all of these three features are related to the preterite present origin of the verbs under analysis.

2.1.1.1 Preterite present origins

According to Helbig and Buscha (2001: 29), one of the essential properties of the six traditional modal verbs is their preterite present origin. As pointed out by Grimm (1822: 851, 1053), preterite presents are preterite forms of strong verbs that were reinterpreted as independent verbs. Roughly speaking, the accomplishment of an event in the past was reanalysed as a resultative state in present. The case of *wissen* ('know') has been intensively investigated, as is illustrated in Table 2.1. According to Meid (1971: 18), its development originates from an early period of

Tab. 2.1: Preterite present origin of *wissen* — the Old High German paradigm

	present	past	present	past	present
infinitive	rīt-an		(wīzz-an)		wizzan
1 st pers. sg.	rīt-u	reit-∅	(wīzz-u)	(weiz-∅)	⇒ weiz-∅
2 nd pers. sg.	rīt-ist	reit-ist	(wīzz-ist)	(weist)	⇒ weist
3 rd pers. sg.	rīt-it	reit-∅	(wīzz-it)	(weiz-∅)	⇒ weiz-∅
1 st pers. pl.	rīt-emēs	rīt-umēs	(wīzz-emēs)	(wizz-umēs)	⇒ wizz-umēs
2 nd pers. pl.	rīt-et	rīt-ut	(wīzz-et)	(wizz-ut)	⇒ wizz-ut
3 rd pers. pl.	rīt-ent	rīt-un	(wīzz-ent)	(wizz-un)	⇒ wizz-un
meaning	‘ride’	‘rode’	‘see’	‘saw’	‘know’

Indo-European. Rix (2001: 606) assumes an Indo-European root **u̯eid* ‘see’ with its corresponding preterite stems **u̯óida* ‘I saw’ and **u̯id-* ‘We saw’. Already in the Indo-European period, the preterite stems developed an independent meaning. Whereas in the original sense they referred to a seeing event in the past, they refer to a knowing state in the present in its reinterpreted form. Birkmann (1987: 351) illustrates this evolution from Proto-Germanic up to Modern German:

- (2) New High German *weiß* < Old High German *weiz* < West Germanic **weit* < Proto Germanic **wait* < Indo-European **u̯óida* ‘I know’ ⇐ ‘I saw’
- (3) New High German *wissen* < Old High German *wizzum* < West Germanic **witum* < Proto Germanic **witum* < Indo-European **u̯id-* ‘We know’ ⇐ ‘We saw’

During this process the form *wissen* maintained its preterite morphology of a strong verb. This becomes visible as soon as it is compared with a preterite form of a verb belonging to the same class of *ablaut*, as *reiten* (‘ride’), for instance. And indeed, following Birkmann (1987: 135) and Braune and Reiffenstein (2004), *wissen* inflected for present tense behaves exactly as *reiten* in its preterite use, as is illustrated for Old High German in Table 2.1. Even if Pokorny (1959: 1126) adduces a verb *wīzzan* ‘look out, observe’ for Old High German, this does not mean that the process of reinterpretation only took place in that period. Effectively, the emancipation of the new meaning of *wizzan* already took place in Indo-European times. The reason why *wīzzan* is nevertheless included in Table 2.1 is only for ease of illustration. It only demonstrates what the original stem **u̯eid* would have looked like in Old High German. In essence, these patterns remain the same for New High German.

There are three characteristics that are particular to preterite presents: (i) the 1st and the 3rd person singular remain without suffix in present tense. A similar observation was made by Claius (1578: 96), who noticed that there are nine verbs

that lack suffixes in the 1st and 3rd person singular, which makes them to appear monosyllabic: *können*, *mögen*, *woellen*, *sollen*, *wissen*, *taugen* ‘to be good for sth’, *thuerren* ‘dare’, *düerfen* and *müssen*. (ii) They involve a vowel alternation between the present tense indicative stems in singular and plural, and (iii) they exhibit a further vowel alternation between the stem of the present tense and the past tense. As for the six verbs listed in (1), it turns out that indeed almost all of them are of preterite present origin. As, among others, Braune and Reiffenstein (2004) illustrate, *können*, *müssen*, *dürfen*, *sollen* and *mögen* can be derived from preterite stems of other verbs. Based on the observations about the Gothic counterpart *viljan* ‘want’, Grimm (1822: 853) illustrates that *wollen* originates in a subjunctive of the past form of a volitional verb. A similar analysis of the development of German *wollen* was suggested by Braune (1886: 259). However, in the course of history, *wollen* assimilated its morphological properties according to the paradigm of preterite presents, as illustrated by Braune and Reiffenstein (2004).

The different origin of *wollen* is partly reflected in its deviating inflectional pattern. It does not involve a vowel alternation between the preterite stem and the infinitive. Therefore criterion (iii) for preterite present is not met, as indicated in Table 2.2. Upon closer inspection, however, it turns out that the genuine preterite present *sollen* even fails to fulfil two of the characteristics particular to preterite presents. It involves no vowel alternation at all; correspondingly, criteria (ii) and (iii) are not met. In a similar fashion, *muozan* lacked the vowel alternation between the indicative forms in singular and plural in Old High German, violating criterion (ii), as illustrated by Birkmann (1987: 129).

Finally, the status of criterion (iii) is unclear, as it does not uniquely apply to preterite present verbs, but can be found with many more verbs. More specifically, the vowel alternation between the infinitive and the past tense stem is a characteristic that affects most of the irregular verbs as well. As illustrated by Eisenberg et al. (2005: 491–502), there are more than 190 irregular verbs that display a vowel alternation between the present stem and the past stem.

As a consequence, preterite present morphology cannot be regarded as a suitable property to unify the traditional six modal verbs in a homogeneous class. A definition of the modal verbs based on the preterite present morphology faces a further challenge, since it incorrectly includes *wissen*, which is apparently the oldest among the preterite presents and, unlike *sollen*, has preserved all of the relevant features of preterite presents.

Typically, authors who suggest a definition of modal verbs which is based on their preterite present origins, Curme (1922: 317), acknowledge at some later point that *wollen* has, in fact, a different origin and only assimilated over the course of time. In this respect, German behaves differently from English, where the class of preterite presents coincided with a group of verbs with ‘modal’ meanings, as

Tab. 2.2: Modal verbs and preterite present morphology

	1 st and 3 rd p. present tense without suffix		vowel change		vowel change	
	1 st /3 rd p. sg.	1 st -3 rd p. sg	1- 3 rd p. pl.	infinitive	past tense	
<i>können</i>	<i>kann-∅</i>	<i>kann</i>	<i>können</i>	<i>können</i>	<i>konnte</i>	
<i>müssen</i>	<i>muß-∅</i>	<i>muß</i>	<i>müssen</i>	<i>müssen</i>	<i>mußte</i>	
<i>mögen</i>	<i>mag-∅</i>	<i>mag</i>	<i>mögen</i>	<i>mögen</i>	<i>mochte</i>	
<i>dürfen</i>	<i>darf-∅</i>	<i>darf</i>	<i>dürfen</i>	<i>dürfen</i>	<i>durfte</i>	
<i>wollen</i>	<i>will-∅</i>	<i>will</i>	<i>wollen</i>	wollen	wollte	
<i>sollen</i>	<i>soll-∅</i>	soll	sollen	sollen	sollte	
<i>wissen</i>	<i>weiß-∅</i>	<i>weiß</i>	<i>wissen</i>	<i>wissen</i>	<i>wußte</i>	

Lightfoot (1979: 102) has pointed out. All of the other preterite presents vanished. This in turn triggered a radical process of syntactic change with the result that all of the preterite presents were reanalysed as auxiliaries. Lightfoot (1979: 98) stresses that preterite presents in Old English *sculan*, *willan*, *magan*, *cunnan* and *motan* exhibited all features that are typical of a canonical verb. In the 16th century, however, they suddenly lost these features and were reanalysed as functional elements. To sum up, preterite present morphology cannot be employed as class defining property to separate the six traditional modal verbs from the remaining verbal elements: *wollen* is not a preterite present and there is a further preterite present, *wissen*, which is usually not considered as a modal verb.

2.1.1.2 The IPP-effect: The *Ersatzinfinitiv*

A further criterion that is invoked in traditional definitions is the *Ersatzinfinitiv* or *infinitivus pro participio* (IPP-effect), as in Helbig and Buscha (2001: 115). Verbs such as *dürfen* will usually be realised with infinitive morphology whenever they are embedded by the perfect auxiliary *haben* ‘have’. As opposed to the canonical type of verb, the *ge*-participle is not available in this environment for the six traditional modal verbs.² This holds true at least in Standard German, while some Western German dialects do not exhibit the IPP-effect and employ the *ge*-participle in corresponding contexts.³

² The status of the IPP is fairly contested. Some scholars, e.g. Hinterhölzl (2009: 198), argue that it is a genuine infinitive, others argue that it is a hidden participle. A detailed discussion is provided in Hinterhölzl (2009: 197–198). As it fulfils a similar role as the common *ge*-participle, it will be glossed as: PPP(ipp). However, this should not be taken to imply that the IPP has really substantially the same function as a *ge*-participle.

³ In some varieties, the acceptability of *ge*-participles increases when the bare infinitive appears separated from the modal verb. However, as the following sentences were taken from a show of

- (4) Das hättest du nicht sagen dürfen / *gedurft
 that had you NEG say-INF may-PPP(ipp) may-PPP(ge)
 ‘You shouldn’t have said that.’

The relation to the present preterite history of these verbs is obvious. Being former preterite tense forms of some other verbs, the traditional six modal verbs were lacking a full inflectional paradigm. Therefore, it became necessary to develop a past participle of their own. But as already explicitly pointed out by Kurrelmeyer (1910: 167), the IPP-effect is not a genuine innovation of modal auxiliary verbs: The first of the traditional modal verbs that can be found with the IPP-effect is *müezen* in the 15th century, and the last one is *sollen*, which is only recorded from the 16th century onwards. Some other verbs exhibit the IPP-effect much earlier: *tun* ‘do’ (1259), *helfen* ‘help’ (1263), *hoeren* ‘hear’ (13th century), *heizen* ‘command’ (1277), *lazen* ‘let’ (13th century), *sehen* ‘see’ (14th century), *machen* (1475). In a similar vein, Hinterhölzl (2009: 202) argues that the IPP-effect originally emerged with *heißen*, *lâzen*, *tun* and *hoeren* and only spread to the preterite presents over the course of time. This is also confirmed by Ebert et al. (1993: 413–414), who show that *müssen* already occurred with the IPP-effect in the 13th century, whereas the remaining traditional modal verbs *wollen*, *mögen* and *können* only acquired it in the course of the 15th century, or even later, such as *sollen* and *dürfen*.

As already mentioned above, it seems plausible that preterite present verbs and other verbs with defective paradigms, such as *wollen*, seek to complete their morphological inventory. The remaining preterite presents, which are not part of the traditional six modal verbs, are also found with the IPP-effect, at least in earlier stages of German. Kurrelmeyer (1910: 164) gives an example for *türren* ‘dare’ with an infinitive complement displaying the IPP-effect from the year 1375. Moreover, there are numerous occurrences of *wissen* with a *zu*-infinitive from the 17th century that display an interpretation which refers to a mental ability read-

the comedian Karl Valentin, conclusions concerning linguistic theories should be handled with care.

- (1) Wollen hätte ich schon gedurft...
 want-INF had I though may-PPP(GE)
 ‘It was okay for me to want it.’
 DeReKo: M09/AUG.63846 Mannheimer Morgen, 15.08.2009.
- (2) Wollen hätten wir schon mögen, aber trauen haben wir uns nicht gedurft.
 want-INF had we though like-PPP(ipp) but dare-INF had we us NEG may-PPP(ge)
 ‘To want it was appealing, but we were not permitted to dare it.’
 DeReKo: NUN08/JUL.00977 Nürnberger Nachrichten, 09.07.2008.

ing exhibit the IPP-effect, as illustrated in examples (5)–(12). This was already pointed out in the 17th century by Bödiker (1698: 109; see Section 2.3 for more details), as well as Grimm (1837: 168), Sanders (1908: 428), Alban (1992: 6), Ebert et al. (1993: 413) and Maché and Abraham (2011: 256). In contrast to the remaining preterite presents, *wissen* is persistently used with an infinitive with *zu*.

- (5) der Arzt Asclepiades hat durch den beweglichen Wollaut
the physician Asclepiades has by the moving euphony
der lieblich=zusammenklingenden Seiten/ die abweichende
the-GEN lovely.harmonic chords the deviating
Vernunft abzuhalten wissen/⁴
reason detain-INF know-PPP(ipp)
'The physician Asclepiades knew how to use the moving euphony of harmonic chords to prevent distraction of thought.'
- (6) liesz mein buechlin, so wirstu sehen, das der luegengeist nicht
read my book so will.you see that the lye.spirit NEG
hat wissen zu antworten⁵
has know-PPP(ipp) zu answer-INF
'Read my book and you will see that the lying spirit was not able to answer.'
- (7) Agricola: Ich hab nichts darinn wissen zuo meiden
Agricola I have nothing there.in know-PPP(ipp) zu avoid-INF
oder außzuelassen.⁶
or zu.ignore-INF
'Agricola: I could not have avoided or ignored any of them.'
- (8) Er hat sich wissen ò gewust in seine Gnade
he has ANA know-PPP(ipp) or[Italian] know-PPP(ge) in his mery
einzuschleichen⁷
zu.-INF
'He made himself endear to him.'
- (9) Sie hat nicht wissen ò gewust zu hüten⁸
She has NEG know-PPP(ipp) or[Italian] know-PPP(ge) zu watch-INF
'She couldn't watch (it).'

⁴ Schottelius, *Ausführliche Arbeit von der Teutschen HauptSprache* (1663), p. 67.

⁵ Martin Luther 26, 613 W, [as cited in Grimm DWB].

⁶ Johannes Cochläus, *Ein heimlich Gespraech von der Tragedia Johannis Hussen*, Actus tertii scena unica, (1538), B 3a.

⁷ Matthias Kramer, *Das herrlich-Grosse Teutsch-Italiänische Dictionarium* (1702), p. 1368.

⁸ Matthias Kramer, *Das herrlich-Grosse Teutsch-Italiänische Dictionarium*, (1702), p. 1368.

- (10) er hat es nicht auszurichten wissen⁹
 He has it NEG transmit.ZU-INF know-PPP(ipp)
 ‘He could not transmit it.’
- (11) Sie hätten damit nichts wissen anzufangen¹⁰
 they had with.it nothing know-PPP(ipp) start.ZU-INF
 ‘They did not know what to do with it.’
- (12) Hat Rom sein siebenbergigt Haupt sonst nirgends hin zulegen
 Has Rome its seven.hilled head apart nowhere PAR lay-INF
 wissen¹¹
 know-PPP(ipp)
 ‘Rome did not have any other place for its head made of seven hills to lay.’

Yet, there are instances of *wissen* which do not carry the infinitive particle *zu* and which govern a bare infinitive complement. This behavior may be caused by the conjunction with a more prototypical modal verb, *wollen*, which is restricted to the subcategorization of bare infinitive complements. But the fact that *wissen* occurs conjoined with *woellen* sharing the same infinitival complement illustrates how close these verbs are syntactically speaking.

- (13) Das Ebreisch wort Moed / habē wir nicht anders
 the Hebrew word Moed have-1.P.Pl we NEG differently
 wissen noch woellen deutschen¹²
 know-PPP(ipp) nor want-PPP(ipp) germanise-INF
 ‘We were not able nor did we want to translate the Hebrew word Moed in a different way.’

Interestingly, most of the occurrences of *wissen* collected here are in the scope of negation. This is reminiscent of the negative polar behaviour of other modal verbs such as the raising pattern of *wollen*, the emotive use of *mögen* and earlier uses of *dürfen* and *brauchen*, as is illustrated in Sections 2.2.3, 2.2.4, 2.2.7 and 2.2.9. Moreover, these examples exhibit a word order that contradicts the patterns typical of coherence/clause union (2-1 or 1-3-2). Only in example (10) given by Grimm (1837: 168), does the subcategorised infinitive complement immediately precede *wissen*. As Grimm (1837: 168) notices, the IPP-effect with *wissen* can be frequently observed in the vernacular. Nevertheless, he regards this use as false, since the

⁹ As discussed in Grimm IV, 168.

¹⁰ Hebel, [as cited in Sanders (1908), p. 428].

¹¹ Daniel Casper von Lohenstein, *Ibrahim Bassa*, (1653), [as cited in Schoetensack 1856, 298].

¹² Martin Luther, *Biblia, Mose, Das Ander Buch, XXVII*, footnote a, p. 53 (1533).

IPP-effect is a property that is restricted to verbs that sub-categorise bare infinitive complements. Instead, he recommends employing the *ge*-participle *gewußt* in these contexts.

As demonstrated by Maché and Abraham (2011: 269), there are at least two properties that make verbs with non-finite complements susceptible to the IPP-effect: a defective paradigm, as in the case of preterite presents and *wollen*, and raising infinitives, such as the subject-to-object raising (Acl) verbs *lassen* ‘let’, *hören* ‘hear’, *sehen* ‘see’ and *fühlen*; ‘feel’ and the subject-to-subject raising verbs, *pflügen* ‘used to’ and *düncken* ‘seem’, which both exhibited the IPP-effect during the Early New High German period. A third relevant property is the selection of bare infinitive complements. Returning to the modal verbs, it becomes clear why they are such prominent exponents of verbs with the IPP-effect: They carry all of those properties. They exhibit raising patterns (as will be shown in more detail in Section 2.2), a defective paradigm, and finally, they select bare infinitive complements. This explains why they are susceptible to this morphological anomaly to such a great extent.

At this point, it also becomes clear that the traditional six modal verbs did not grammaticalise as a block; rather, each verb had its own development and each development had its own pace. This in turn demonstrates that the extension of the group of verbs with auxiliary-like behaviour differed with respect to the particular period. As will be shown in Section 2.1.2.1, each of the traditional six modal verbs developed the ability to select bare infinitive complements at an individual point of time. If there were periods during which the traditional modal verbs did not constitute a homogeneous class, one may have to reassess the empirical evidence in order to find out whether there is a period at all in which these six verbs form a class of this type. Even if the six traditional modal verbs acquired the IPP-effect before they developed a *ge*-participle of their own, as Ebert et al. (1993: 414) shows, it turns out that, from a diachronic perspective, the IPP-effect is not a property which is restricted to the six traditional modal verbs.¹³

¹³ Kurrelmeyer (1910: 165) discusses a somewhat controversial example from a charter from the year 1332, which is taken to be a *ge*-less past participle:

- (1) Swelhie fraw niht gehorsam hat getan oder tun wolt
 which.ever lady NEG obedience has do-PPP(*ge*) or do-INF may-PPP(?)
 ‘Whatever lady that refused to obey or wanted to do so.’

Arguably, *wolt* could also be analysed as preterite 3rd person singular form. Yet, Schallert (2014: Sect. 4.1, 2014: 187–188) and Fleischer and Schallert (2011: 184) have pointed out that the participle forms of preterite-presents were occasionally realised as weak participle lacking the *ge*-prefix, which are commonly referred to as ‘truncated participles’.

Shifting to a synchronic view, the situation is no different. Apart from the six traditional modal verbs, there is at least one further verb that obligatorily exhibits the IPP-effect whenever it is embedded by the perfect auxiliary *haben*: The causative use of *lassen* ‘let’, as has been pointed out by Schmid (2000: 328). Once more, the *ge*-participle is not available, as in example (14). Therefore, beginning with Becker (1841: 219), *lassen* has sometimes been counted among the traditional class of modal verbs.

- (14) Sie hat ihren Mann umbringen lassen / *gelassen
 She has her husband kill-INF let-PPP(ipp) let-PPP(ge)
 ‘She let him be killed.’

Note that *lassen* also has a permissive use (‘to tolerate’) and a relinquative one (‘to leave something behind, let go’), as argued by Maché and Abraham (2011: 260). According to Aldenhoff (1962: 204), the causative and the permissive use always exhibit the IPP-effect, whereas the relinquative use is optionally realised as the *ge*-participle. Some speakers, however, also accept *ge*-participles of permissive *lassen*. Finally, the remarkable case of *brauchen* ‘need’ has to be mentioned, which, in contemporary standard German, always exhibits the IPP-effect. Again, the *ge*-participle is ungrammatical:

- (15) a. Aber Flavio Cotti hätte nicht zu kommen
 But Flavio Cotti have-SBJV.PST NEG to come-INF
 brauchen.¹⁴
 need-PPP(ipp)
 ‘But it wouldn’t have been necessary for Flavio Cotti to come’
- b. * Aber Flavio Cotti hätte nicht zu kommen gebraucht.

Being very close to the traditional modal *müssen* in semantic respect, *brauchen*, too, seems to have assimilated to its counterpart in morphological respects. Most importantly, this concerns the development of the IPP-morphology. It was already observed by Grimm (1837: 168, 949) that *brauchen* occasionally exhibits the IPP-effect, as is shown in his own example (16).¹⁵

¹⁴ DeReKo: E98/JUN.15388 Zürcher Tagesanzeiger, 19/06/1998.

¹⁵ As will be shown in Section 2.2.9 in more detail, in some regions, *brauchen* is even subject to further processes of assimilation. According to André Meinunger (pers. commun.), this morphological assimilation of *brauchen* towards the “modal” morphology is even more developed in the region around Wuppertal, where speaker omit the *t*-suffix of the 3rd person indicative singular, as in the sentence *Er brauch-∅ nicht kommen* ‘He need-∅ not come’. Similar observations about *brauchen* have been already made by Wurzel (1984: 117 & 149), Birkmann (1987: 5) and Girnth (2000: 115) and Beringer (s.a.). In this respect, *brauchen* is reminiscent of *need* in Modern Eng-

- (16) das hätte ich nicht zu tun brauchen (gebraucht)
 that have-SBJV.PST I NEG to do-INF need-PPP(ipp) need-PPP(ge)
 'I wouldn't have had to do it.'

Even if he acknowledges that this pattern is frequent in colloquial speech, Grimm is reluctant to consider it as fully grammatical. According to him, the IPP-effect only occurs with bare infinitives. In contrast, *brauchen* sub-categorises for a *zu*-infinitive. For this reason, he refers to the correct alternative, the *ge*-participle, in brackets. As Sanders (1908: 101) demonstrates, *brauchen* with an infinitive complement could instead be realised as a *ge*-participle up to the 19th century:

- (17) er hätte nur die Regungen der eigenen Brust zu
 he have-SBJV.PST only the emotions the-GEN own chest to
 besingen gebraucht¹⁶
 sing need-PPP(ipp)
 'He only needed to sing about the emotions in his chest.'

In opposition to Grimm (1837), Sanders (1908: 101) considers *brauchen* with the IPP-effect as grammatical. Moreover, he argues that the infinitival particle *zu* can occasionally be dropped, which is remarkable since Sanders takes a rather normative perspective. The optionality of the *zu*-particle will be dealt with in Section 2.2.9.4.

Apart from causative *lassen* and *brauchen* with an infinitive, there is a large group of verbs that optionally permit the IPP-effect: Following Schmid (2000: 330) in particular, this concerns the ACI verbs (object-to-object raising, exceptional case marking) *sehen* 'see', *hören* 'hear', *fühlen* 'feel', and benefactive verbs such as *helfen* 'help', *lernen* 'learn' and *lehren* 'teach'. Aldenhoff (1962) and Sanders (1908: 222) provide an extensive discussion of this issue.

In a less systematic way, Heyse (1822: 413) has already observed that the IPP occurs with a whole range of verbs: *dürfen*, *heißen*, *helfen*, *hören*, *können*, *lassen*, *mögen*, *müssen*, *sollen*, *sehen*, *wollen*, *lehren* and *lernen*. Yet, Heyse (1822: 414) argues that this use is a severe violation of the logical principles ('grober Verstoß gegen die Logik'). Accordingly, he suggests to better use the *ge*-participles of these verbs, even if they take infinitive complements. Likewise, Schoetensack (1856: 298) has pointed out that the IPP has been observed with a similar group of verbs: *hören*, *heißen*, *sehen*, *helfen*, *lassen*, *sollen*, *wollen*, *mögen*, *dürfen*, *müssen*, *wissen*, *können*, *fühlen*, *lehren* and *lernen*.

lish, which lacks an *s*-suffix if it is used with an infinitive complement, as has been described by Sweet (1891: 425).

¹⁶ Heine 2, 307, as cited in Sanders (1908: 101).

As demonstrated above, the IPP-effect is not a property that is restricted to the traditional six modal verbs. Hence, it is not suitable as class defining property. For the sake of completeness, note that some grammarians indeed suggest that the IPP-effect is the essential criterion for auxiliary-hood, acknowledging that the extension of such a class does not exactly correspond to the six traditional modal verbs. The first person who discussed the IPP-effect was Ölinger (1574: 151). As he observes, the five verbs *woellen*, *sollen*, *doerffen*, *koennen* and *moegen* do not employ a *ge*-participle, but rather an infinitive, whenever they are embedded under a perfect tense auxiliary. Bödiker (1698: 109), in turn, argues that, because of their morphological anomaly, these five verbs together with *muessen* and *wissen* constitute an auxiliary-like class. In a similar vein, Sanders (1908: 222) argues that there are a number of auxiliaries in German characterised by the IPP-effect and encompassing the following items: *d"urfen* 'may', *heißen* 'command', *helfen* 'help', *hören* 'hear', *können* 'can', *lassen* 'let', *lehren* 'teach', *lernen* 'learn', *machen* 'make', *mögen* 'like', *müssen* 'must', *sehen* 'see', *sollen* 'shall', *wollen* 'want' and occasionally *brauchen* 'need', *pflügen* 'used to', *suchen* 'seek', rare *empfinden* 'feel', *erblicken* 'see', *finden* 'find', *fühlen* 'feel', *schauen* 'look', *wissen* 'know', and *zeigen* 'show'.

In any case, the IPP-effect is not a property that justifies a modal verb class in the traditional extension, neither from a synchronic nor from a diachronic perspective. Nevertheless, it has proven to be a powerful criterion since there are only two more verbs apart from the traditional six modal verbs that obligatorily exhibit the IPP-effect: (the causative use of) *lassen* and *brauchen*.

2.1.1.3 Imperative

Some authors, e.g. Welke (1965: 14), Eisenberg (2004: 91) and Erb (2001: 97), argue that the six traditional modal verbs are further characterised by their inability to form imperatives. This perspective has already been taken by Claius (1578: 103), who claimed that those verbs today referred to as preterite presents, with the exception of *wissen*, do not have an imperative. In a similar fashion, Adelung (1801: 1608) argues that *wollen* does not form an imperative. It is not evident whether these observations indeed hold, since at least two hundred years later the imperative of *wollen* is documented, as is illustrated by the dialogue below taken from Goethe's *Faust* (cf. 18). Some authors, such as Voß, use the imperative even when *wollen* occurs with infinitive complement (cf. 19).¹⁷

¹⁷ Johann Wolfgang von Goethe, *Faust - der Tragödie erster Teil*, V 4543, (1808).

- (18) a. MARGARETE: [...] Du gehst nun fort? Oh Heinrich, könnt ich
 you go PAR away oh Heinrich could I
 mit!
 with
- b. FAUST: Du kannst! So **wolle** nur! Die Tür steht offen!
 you can so want-IMP just the door stands open
- (19) Woll' auch diesen verzeihn! – Für uns nicht brauchst du zu
 want also them forgive-INF for us NEG need you to
 beten!¹⁸
 pray-INF
 'Forgive them, too – You do not need to pray for us.'

As already pointed out by Zifonun (1997: 1254), Hetland and Vater (2008: 99) and Vater (2010: 108) *wollen* has an imperative. Admittedly, this form is only available when *wollen* is used without an infinitive complement. It is important to keep in mind that even if the imperative usage of *wollen* is rather rare, it is much more acceptable than the imperative usage of other modals. This illustrates that there is a substantial difference between *wollen* on the one hand and the remaining traditional modal verbs on the other hand. In a similar vein, Hetland and Vater (2008: 97) observe that each modal behaves differently in a morpho-syntactic manner. The markedness of the imperative with the traditional six modal verbs might be also related to the defective nature of their paradigm. Likewise, the imperative of the last remaining preterite present, apart from the modal verbs, *wissen*, is equally marked as the one of *wollen*, at least in Contemporary German. As already pointed out by Claius (1578: 103), the lack of imperative forms is a criterion that holds for most preterite presents, including verbs that do not belong to the modal verb class in its traditional extension, such as *thar* 'dare' and *taug* 'suit'. Accordingly, this criterion does not justify treating the six traditional modal verbs as a homogeneous class, either.

2.1.2 Syntactic criteria

The most important syntactic criterion that is invoked for the separation of the six traditional modal verbs from the remaining elements of the verbal category concerns the category of the complement.

¹⁸ *Verwandlungen, Third book – Pentheus*, I, 192.104, translated by Johann Heinrich Voß, Berlin: Friedrich Vieweg der Ältere (1798).

2.1.2.1 The sub-categorisation of bare infinitive complements

As Welke (1965: 11 & 22) and Griesbach and Schulz (1960: 41 & 65) argue, an essential characteristic of the traditional six modal auxiliaries is the selection of bare infinitive complements. But as Welke (1965) acknowledges, there are many more verbs in Contemporary German that sub-categorise bare infinitive complements. Following Maché and Abraham (2011: 236), at least ten different groups of predicates come into consideration. On the one hand, there are verbs that take bare infinitive complements but never *zu*-infinitives (cf. 20):¹⁹ the ‘*do*-support auxiliary’ (cf. 20a), the future auxiliary (cf. 20b), the subjunctive auxiliary (cf. 20c), the traditional modal verbs (cf. 20d), subject-to-object raising (AcI) verbs (cf. 20e), verbs of motion (cf. 20f), verbs of caused motion (cf. 20g), and durative verbs (cf. 20h).²⁰ On the other hand, there are verbs for which both types of realisation of the non-finite complements can be found: bare infinitives and *zu*-infinitives, see (21). Above all, this concerns benefactive verbs (cf. 21a and 21b). The latter is a somewhat remarkable case because the realisation of the complement type is governed by the register. Whereas *zu*-infinitive prevails in written standard language, the bare infinitive is almost restricted to spoken language.

- (20) a. *tun* ‘do’
 b. *wird* FUT.AUX
 c. *würde* SBJV.AUX
 d. *können, müssen, wollen, dürfen, sollen, mögen, (möchte/n)*
 e. *sehen* ‘see’, *hören* ‘hear’, *fühlen* ‘feel’, *finden* ‘find’, *spüren* ‘feel’, *lassen* ‘let’, *heißen* ‘command’, *machen* ‘make’, *haben* ‘have’
 f. *kommen* ‘come’, *gehen* ‘go’, *fahren* ‘ride’
 g. *schicken* ‘send’, *senden* ‘send’
 h. *bleiben* ‘stay’, *sein* ‘be’
- (21) a. *brauchen*
 b. *lernen, helfen, lehren*

This classification does not entirely correspond to the one of Askedal (1989: 5). He suggests that *zu*-infinitives occurring with the verbs of motion in example (20f)

¹⁹ Of course, some of the verbs below, such as *sein* ‘be’ or *haben* ‘to have’ can be found with the *zu*-infinitive or other types of non-finite complements, but in these instances they will exhibit a different semantic interpretation.

²⁰ As has been pointed out by Langer (2001: 63), the auxiliary *tun* in German has a whole range of functions: It can bear the past or subjunctive of the past morpheme and it is used to obtain particular configurations of information structure such as V-topicalisation.

and verbs of caused motion in example (20g) have to be considered as their complements. Yet, he admits that the option of containing the *zu*-infinitive in example (22b) is only rarely used and is hardly found in verbal complex configurations (“obligatorily coherent” in the terms of Bech (1955)), where the infinitive complement has to precede the finite verb, as in example (22a).

- (22) a. obwohl sie jede Woche zum Priester [beichten ging]
 though she every week to.the priest confess-INF went
 ‘Although she went to the priest to attend her confession every week.’
- b. obwohl sie jede Woche zum Priester [ging] [zu beichten]
 though she every week to.the priest went zu confess-INF
 ‘Although she went to the priest each week in order to attend her confession.’

Therefore, it does not seem plausible that the two types of infinitives have the same status. And there are more arguments against the hypothesis considered by Askedal (1989). Whereas the goal PP *zum Priester* ‘to the priest’ can be omitted in the first example without any ado, the omission of the goal PP is subject to many more restrictions in the second example, indicating that the bare infinitive may only function as a goal argument. Moreover, the first pattern only entails the realisation of the event expressed by the infinitive in the examples above. Whereas the bare infinitive typically encodes the goal of the movement, the *zu*-infinitive rather indicates its purpose. Accordingly, the latter could easily be identified as reduced forms of adverbial *um-zu*-infinitives, which express the purpose of the event described in the main clause, as discussed by Eisenberg (1992, 2004: 351).

This illustrates, once again, that bare infinitive complements are found with a considerable number of verbs in Contemporary German. However, focusing on verbs where the infinitival subject is co-referential with the matrix subject, Welke (1965: 11 & 22) and Zifonun (1997: 1253-4) argue that most verbs of this class are restricted to a small group of types of infinitives. In particular, Welke mentions verbs of motion, such as *kommen* and *gehen*, and the durative verb *bleiben*, which is restricted to the selection of stative predicates. According to them, the only group of verbs which does not exhibit selectional restrictions with respect to the infinitive of this type encompasses the six traditional modal verbs. Furthermore, there are two more verbs that behave accordingly, but Welke (1965: 11) explicitly excludes both of them from his definition: The auxiliary *tun* for not belonging to the standard variety, and *werden* for the lack of past forms. As he acknowledges himself, his approach is somewhat arbitrary. Note that Welke’s observation above is not quite correct, as even the six traditional modal verbs fail to embed certain types of stative predicates (individual level predicates) in their non-epistemic variant, as will be shown in more detail in Section 3.2. Moreover, Engel (1996: 476) argues that *tun* and *bleiben* do not belong to the class of modal verbs since they use *-t* in

third person singular, and as opposed to modals they never embed an infinitive perfect (* *Er tut geschlafen haben* ‘He does have slept’).

As it turns out, the sub-categorisation of bare infinitive complements is not a property that is unique to the six traditional modal verbs. As a consequence, it cannot serve to justify a syntactically homogeneous modal verb class in the traditional extension. Nevertheless, it proves to be a powerful criterion that almost manages to separate the six traditional modals from the remaining verbs in German. This will be illustrated in Section 2.1.4.

Assuming that the selection of a bare infinitive complement is the main characteristic of modal auxiliary-hood, the situation is once again different in earlier stages in German. As pointed out by Demske (2001: 76), most verbs that take non-finite complements in Old High German are not restricted to a particular type of infinitive. Without that, the interpretation is affected and they may either take bare infinitive complements or *zu*-infinitives. As Demske (2001: 74) stresses, a small group of verbs is only recorded with bare infinitive complements and never with *zu*-infinitives: The preterite presents *kunnan* ‘be mentally able to’, *durfan* ‘need’, *scolan* ‘shall’, *mugan* ‘can’, *muoz* ‘to have space’, *gitar* ‘dare’ and the verb *wellen* ‘want’, the perception verbs *hören* ‘hear’ and *sehan* ‘see’, causative verbs *lâzan* ‘let’, *heizan* ‘command’ and *gituon* ‘do, make somebody do something’, and finally the raising verbs *scînan* ‘seem’ and *thunken* ‘seem’.²¹

Birkmann (1987) takes a different perspective on the situation in Old High German. In contrast to Demske (2001), his study is restricted to preterite present verbs. According to his investigation of the *Isidor* (late 9th century) and a couple of smaller texts, *skulan*, **muozan*, *eigan* ‘have’, *magan*, *kunnan* can be considered as auxiliaries since they occur with bare infinitive complements; *kunnan* is additionally used as a main verb. In contrast, Birkmann (1987: 161) argues that *wizzan* and *thurfan* lack a use as an auxiliary and only occur as main verbs. Since Demske (2001) does not give precise examples for most of the preterite presents she discusses, it is not entirely clear how to cope with the minor contradictions between her observations and the ones made by Birkmann (1987). In any case, Birkmann (1987: 144) demonstrates that *kunnan* was not frequently used until *Notker* in the early 11th century, and that the situation for *thurfan* is similar.

Diewald (1999: 297) only considers *sculan*, *mugan* and *wellen* to be sufficiently grammaticalised in Old High German. Accordingly, she argues that these are the only modal verbs in that particular period. She explicitly excludes *thurfan* and *kunnan* since she has only found occurrences with nominal complements in her in-

²¹ As Birkmann (1987: 155) demonstrates, the entire paradigm of the verb *muozan* cannot be found in Old High German. For this reason, only the finite form is mentioned here.

vestigation, but none with an infinitive. Moreover, Diewald (1999: 299) does not regard *muozan* as a modal verb because it does not exhibit a ‘modal semantics’, even though it is attested with infinitival complements. As she argues, the meaning of *muozan* from that time is to be paraphrased as ‘to have space to do something’. Her approach, however, is controversial. First of all, it is not clear why Diewald (1999: 299) treats *kunnan* in Old High German as a main verb, as she explicitly refers to Birkmann (1987), who demonstrates that *kunnan* also occurs with an infinitive in that very period. Moreover, her notion of ‘modal semantics’ is rather intuitive and not well defined. In any case, Birkmann (1987: 144) and Diewald (1999: 299) agree that *können* and *dürfen* with an infinitive complement are rare until the end of the Middle High German period.

As has been seen, even from a diachronic perspective, the selection of bare infinitives is not a feature that distinguishes the six traditional modal verbs from the remaining verbs. Rather, some members of the traditional group, such as *thurfan* and *kunnan*, are hardly observed with an infinitive for the Old High German period. Moreover, Birkmann (1987: 144) and Demske (2001: 74) demonstrate that there are also additional verbs in that period that obligatorily select bare infinitives, such as the preterite presents *eigan* ‘have to’ and *gitar* ‘dare’, subject-to-subject raising verbs and subject-to-object raising verbs.

As in Contemporary German, the number of verbs that are sub-categorised for bare infinitives is fairly restricted in Old High German. The two stages differ significantly with respect to the particular verbs that belong to this pattern. But in none of the periods investigated so far does the group of verbs which select bare infinitives correspond exactly to the traditional six modal verbs. Moreover, it turns out that each of the traditional modals acquired the ability to select bare infinitives at a different historical period. As already shown in Section 2.1.1.2, each verb has its own development and each development its own pace. Correspondingly, there is no logical necessity for the class of modal verbs in German to encompass those six members that it encompasses. In fact, the opposite is true, as there is a significant amount of evidence that there might never have been a discrete class of modal verbs, but rather, a loose compound that is in constant change. In a similar spirit, Wurzel (1984: 149) argues that, from the outset, there were two different classes: preterite presents, and verbs that select bare infinitives with modal meanings. Crucially, those classes partially overlapped. Over the course of history, the two classes became increasingly congruent: The non-modal preterite presents lost their anomaly and the non-preterite presents with modal meanings such as *wollen* and *brauchen* assimilated to the preterite present morphology.

Summing up, the ability to select bare infinitive complements is not restricted to the six traditional modal verbs, neither synchronically nor diachronically. In Contemporary German, at least two verbs behave in a comparable way with re-

spect to sub-categorisation, *werden* and *brauchen* in the spoken language. Both of them select bare infinitive complements. Since this property is restricted to the six traditional modal verbs and a small group of verbs apart from them, it appears to be suitable as a class defining property.

In this case, however, it would be necessary to reassess the extension of the class, as will be discussed in Section 2.1.4.

2.1.2.2 Subject-to-subject raising

Recently, another syntactic property has attracted much attention in the discussion about the characteristics of modal verbs in German. Öhlschläger (1989) and Wurmbrand (1999) and Wurmbrand (2001) argue that modal verbs in German are subject-to-subject raising verbs throughout – with the exception of *wollen*, and the ability interpretation of *können* (as well as *möchte*, which is analysed by both authors as an independent lexical item). These are verbs that lack a subject argument of their own and raise their subject from the embedded infinitive.

Wurmbrand (2001: 187) subsumes all modal verbs with raising patterns under the proper syntactic category Mod^0 . In their epistemic interpretation, they are generated as a higher category in Aux^0 . However, there are subject-to-subject raising verbs apart from the six traditional modal verbs, such as *scheinen* ‘seem’, *drohen* ‘threaten’, *versprechen* ‘promise’, and *pflügen* ‘be wont to’. Wurmbrand (2001: 205) argues that all of them can be analysed as epistemic modal verbs. As will be shown in Section 2.2, these four raising verbs differ from epistemic modal verbs in crucial respects and therefore need to be treated separately.

In a recent study, Gergel and Hartmann (2009: 327) suggest in a radical manner that even the apparent control verb *wollen* needs to be considered as a raising verb. Since their Generalized Raising Hypothesis is based upon some non-trivial and theory immanent assumptions such as raising into theta positions, the discussion will be suspended here and resumed in the case studies of control and raising verbs in Section 2.2. Crucially, a notion of modal verbs that is based on raising will not obtain a class extension corresponding to the six traditional items.

2.1.3 Semantic criteria

Finally, and most notably, most modal verb definitions also involve a semantic dimension. This is not surprising since the term *modal* already refers to a semantic phenomenon. But as this definition does not concern the material form of a sign but its immaterial function, there is not so much consensus on what the essential

semantic criterion is for modal verbs. In the upcoming sections, the most plausible criteria will be briefly reviewed.

2.1.3.1 Modality

Like many others, Helbig and Buscha (2001: 44) assume that the traditional six modal verbs are characterised by the fact that they express a modality. According to them, a modality can be realised as an ability, a possibility, a necessity, a wish or the attitude of the speaker. Even if these notions intuitively share some common properties, it is not a trivial matter to identify them. All of these expressions locate the event or state denoted by the verb in some idealised worlds that are distinct from our world. Therefore, a modalised event need not be realised in the actual real world. Portner (2009: 1) suggests a similar definition: ‘Modality is the linguistic phenomenon whereby grammar allows one to say things about, or on the basis of, situations which need not be real’. But as already pointed out by Welke (1965: 19), such an attempt of a semantic definition that is based on the expression of a modality fails, even if one only considers the five types of modality enlisted by Helbig and Buscha (2001). Many more verbs can be found that express one of these modalities, notably *brauchen* ‘need’, *vermögen* ‘be able to’, *haben + zu*-infinitive ‘have to’, *sein + zu*-infinitive ‘is to’.

Moreover, the concept of modality advocated by Helbig and Buscha (2001) is not systematic. As shown by Palmer (1986: 2), the notion of modality is rather vague and leaves a number of possible definitions open. First of all, it needs to be distinguished from the notion of mood. Whereas the term *mood* traditionally refers to an inflectional category, modality is typically marked by (modal) verbs, by particles and clitics Palmer (1986: 22). As Lyons (1977: 452) suggests, modality concerns the ‘opinion and the attitude’ of the speaker. In any case, modality covers much more phenomena than those taken into consideration by Helbig and Buscha (2001). A more systematic theory of modality would also have to consider verbal concepts as “try to”, “plan to”, “intend to”, “be inclined to”, “contemplate doing something”, “dare to” and many more. A corresponding concept of modality would concern an even larger number of verbs. A more elaborate but still rather extensional definition of modality is proposed by Portner (2009: 4), according to whom several subtypes have to be assumed that in turn involve a broad range of additional items to be considered:

1. sentential modality: modal auxiliaries, modal adverbs, generics, habituais, individual level predicates, tense and aspect, conditionals, covert modality
2. sub-sentential modality: modal adjectives, propositional attitude verbs, verbal mood, infinitives, dependent modals, negative polarity items

3. discourse modality: evidentiality, clause types, performativity of sentential modals, modality in discourse semantics

Finally, the major use of one of the six traditional modal verbs in Contemporary German is not captured by Helbig and Buscha's conception: *mögen* in its prevailing use denotes affection.

No matter what concept of modality one adopts, it would never constitute a homogeneous class that only comprises the six traditional modal verbs. Numerous approaches assume that the six traditional modal verbs differ from all of the remaining verbs in that these verbs, and only these verbs, express modality. The underlying concept of modality that these approaches rely on is an arbitrary enumeration of subtypes of modality. Accordingly, their concept of modality is not systematic. This holds true even for the most systematic attempt to establish a unified semantic analysis of the six traditional modal verbs, made by Bech (1949: 38). Being the first one who attributed the term *Modalverb* to the six verbs *können*, *müssen*, *wollen*, *dürfen*, *sollen* and *mögen*, he tries to collect all of the possible readings they occur with. In a second step he groups them into three subclasses: volitional (*wollen*, *sollen*, *dürfen*), emotives (*mögen*) and causal modals (*können*, *müssen*). They are further specified by means of two oppositions. The first one divides active modals (such as *müssen*) from passive ones (such as *können*). This roughly corresponds to the partition into necessity versus possibility modals, as proposed by Kratzer (1978) and Kratzer (1981). The second one determines whether the source of volition (or emotion) is located within the grammatical subject or subject external. Bech's approach is inductive. He assumes a class of modal verbs consisting of six items. He then tries to extract all of the semantic properties they have in common. As illustrated above, the outcome is somehow biased. However, it remains unclear why Bech (1949) chose exactly these six verbs. It should not be surprising to see that Bech's choice was arbitrary. As already indicated by Welke (1965: 19), a definition of a class of modal verbs with the traditional extension based on semantic grounds fails.

The fact that authors often presuppose some concept of modal meaning without giving a clear definition, such as Fritz (1997: 13) and Diewald (1999: 299), deserves closer attention. It is not surprising that such a vaguely defined concept causes so much confusion. Johnen (2003: 11) reports that based on a similar semantic definition of about 230 different verbs are considered to be modal verbs in Portuguese, whereas two of them only carry auxiliary-like properties.

Apart from the work by Kratzer (1978), Kratzer (1981) and Kratzer (1991), there is hardly any other attempt that tries to explicitly define modal verbs. Following the tradition of modal logic, she adopts a possible world semantics. More precisely, Kratzer (1981, 1991: 649) demonstrates that each modal verb can be iden-

tified by means of three dimensions: (i) the modal force is typically either instantiated as universal quantification over possible worlds (necessity) or existential quantification over possible worlds (possibility), (ii) the modal base governs the composition of the set of worlds over which the modal verb quantifies: circumstantial modal verbs operate on worlds which describe the circumstances of the external world, epistemic modal verbs quantify over worlds which describe an epistemic state, (iii) the ordering source which introduces an ethical or volitional ideals according to which the set of possible worlds in the modal base are ordered.

The main advantage of this theory is that elements that allow for different modal interpretations can be treated as uniform lexical entries which have a common and stable modal force, but which are specified for more than one modal base or ordering source. For this reason, Kratzer's account will serve as the reference frame work for the study presented here.

Since Kratzer's approach implies a much broader concept of modality that applies to many more items than the traditional six modal verbs, she does not conform to the class of modal verbs in its traditional extension. Despite its popularity, Kratzer's theory has remained incomplete since the early 1980s and has not undergone any substantial revisions.

In strict contrast to Kratzer (1978, 1981, 1991), a new approach developed by Lassiter (2011) is based on the assumption that modal operators in general do not involve quantification over possible worlds. Based on data from modal comparatives (*ϕ is at least as likely as ψ; it is better to trespass than it is to murder*) and degree modification (*ϕ it is 90% certain; I want very much to travel to Cuba*), Lassiter (2011: 51–63, 141–150) argues that modal operators denote measure functions on propositions. In his approach, modal operators introduce a scale propositions, which are ordered with respect to their probabilities (epistemic) or subjective or moral preferences which are weighted according to their probabilities. For instance, a necessity modal introduces a very high threshold value on this scale, which values all propositions as false that are not in the top most region of the scale.

In essence, Lassiter's work is a critique on Kratzer's concept of the ordering source, which he consequently replaces by a couple of different measurement functions. Even if Lassiter's analysis correctly points out a whole range of difficulties for Kratzer's theory fragment with respect to modal comparison and degree modification, Lassiter's approach makes problematic predictions regarding modal auxiliaries.

Firstly, it has to be highlighted at this point that Lassiter's analysis is primarily based on modal adjectives, rather than modal verbs. As Lassiter (2011: 89–93, 144) acknowledges, there is no empirical evidence that the English epistemic modal auxiliaries *must*, *should*, *might* and their deontic counterparts *must* and *may* de-

note scales. Rather, the opposite is the case, as they neither participate in modal comparison, nor can they be the target of degree modifiers. Furthermore, Lassiter (2011: 132) notices that epistemic modal auxiliaries are upward monotonic, which he considers as a main characteristic for a quantifier. Yet, he concludes for mere theory internal reasons that auxiliaries have to denote scales rather than quantification over possible worlds, though he admits that a quantificational approach for modal auxiliaries in English is not totally excluded.

Secondly, Lassiter (2011: iii-iv, 66–69, 154–164) assumes that epistemic and deontic modal operators involve substantially different types of scales and mechanisms of interpretation. Whereas the former denote ratio scales, the latter denote interval scales which are probability weighted. Accordingly, Lassiter (2011: 99) acknowledges that deontic modals and their epistemic counterparts operate on fairly different domains, and as a consequence, a uniform analysis for ambiguous modal verbs appears hard to maintain. This is an unwelcome side effect.

As long as there is no compelling evidence that modal auxiliaries are interpreted relative to scales, a quantificational approach appears to be preferable for modal auxiliaries and verbs.

2.1.3.2 The expression of the possibility or necessity of the embedded predicate denotation

Becker (1836: 176 §91–§93, 1841: 219) is one of the first grammarians who investigated auxiliary-like verbs in German that exhibit the IPP from a semantic perspective. As he observes, verbs like *können*, *müssen*, *wollen*, *dürfen*, *sollen*, *mögen* and also *lassen* have lost their lexical meaning and only denote an abstract semantic relation:²²

aber sie drücken in ihrer jetzigen Bedeutung nicht mehr den Begriff eines Prädikates aus, sondern bezeichnen nur Beziehungsverhältnisse, nämlich die Möglichkeit und Nothwendigkeit der prädicirten Thätigkeit, die wir oben als Modusverhältnisse des Prädikates bezeichnet haben (§. 59) z.B. „Er kann tanzen“ „Er muß husten“; sie werden daher Hilfsverben des Modus genannt.

The extent to which Becker's (1836, 1841) approach anticipates the spirit of modern modal logic analyses, such as the one suggested by Kratzer (1978) and Kratzer (1981), deserves closer attention. The basic concepts are necessity and possibility.

²² “[...] but, in their contemporary usage, they no longer express the notion of a predicate, but merely denote relations, namely the possibility and the necessity of the predicated activity, which we called the mood of the predicate above (§ 59), e.g. “He can dance”, “He must cough”; they are therefore called auxiliaries of mood.” [own translation]

Much like Kratzer's modal base, Becker (1841: 221) suggests three types of specifications. Accordingly, necessity or possibility can be specified as real, moral or logical, whereas the last type corresponds to epistemic modality. Becker (1841) is one of the first grammarians who observes this type of modality.

Becker (1841) is not only the first one who attempts to give a general semantic description of these seven items that is based on the concept of necessity and possibility, but also the first who adopts the term *Modus* 'mood' to denominate these seven auxiliary-like verbs. It is fairly likely that Becker (1841) is even the origin of the contemporary concept of the modal verb class. It is only a small step from his original term *Huelfsverben des Modus* 'auxiliaries of mood' to *Modalverb*, as it is used by Bech (1949).

Even if Becker (1841) is on the right track, some amendments still have to be made. He proposes a very clear definition of modality in terms of necessity and possibility; yet, it remains mysterious how the volitional use *wollen* and the emotive use *mögen* fit into this picture. Moreover, his definition also applies to a whole range of other verbs.

2.1.3.3 The availability of an epistemic interpretation

The most viable semantic criterion that can be invoked to justify the establishment of an independent class of modal verbs is the availability of an epistemic interpretation. It took a fairly long time in grammatical research until the peculiarity of these readings was acknowledged. Probably, the first one to consider epistemic readings as a general property of modal verbs is Becker (1841: 221), who briefly discusses the so-called logical possibility and necessity readings for *kann*, *dürfte*, *muß*, *will*, *soll* and *mag*.

- (23) Er kann (dürfte, muß, soll) schon angekommen sein.
 he can might must shall already arrived-PPP be-INF
 'He could/might/must/is said to have already arrived'
- (24) Man will ihn gesehen haben.
 one wants him see-PPP have-INF
 'Somebody claims to have seen him'

In contrast to a moral or real possibility, *kann* in example (23) denotes a logical possibility. This latter type expresses that, in view of what he knows, the speaker considers it possible that the propositional content of the modified clause holds. As Becker (1836: 180) already argues, the logical modal verbs differ with respect to subtleties in their interpretation: *kann* refers to a possibility; *dürfte* to a probability; *mögen* always has a concessive resonance; *muss* refers to a logical necessity evaluated by the speaker; *wollen* expresses a logical necessity assessed by the

subject referent and *sollen* expresses a logical necessity evaluated by another referent. For a couple of decades, until the beginning of the 20th century, epistemic readings did not attract too much attention. At best they are mentioned, but their particular status remains veiled. As one among few, Curme (1922: 319) enumerates the epistemic interpretation for each of the six traditional modal verbs, but he does not pay any further attention to them, just as Bech (1949) does not. Most grammars, such as Vernaleken (1861), however, go as far as to ignore the epistemic interpretation completely.

Only in the early 1960s did Griesbach and Schulz (1960: 65) acknowledge the availability of an epistemic reading as an essential characteristic of the six traditional modal verbs. They are the first who systematically describe this type of modality for modal verbs in German. In their opinion, modal verbs are characterised by the availability of two different interpretations: an objective (non-epistemic, root) one, and a subjective (epistemic) one. Their position has frequently been adopted, e.g. by Öhlschläger (1989: 132), Engel (1996: 463), Diewald (1999: 1) and Reis (2001: 287). In more recent research this property has been referred to as poly-functionality. In a less explicit way, Erb (2001: 74) also makes use of this concept.

As Westmoreland (1998: 12) and Ziegeler (2006: 90) point out, epistemic modifiers are subject to a particular condition. Since they label the modified proposition as a mere assumption of the speaker, it follows that the epistemically modified proposition is not part of the speaker's knowledge.

Accordingly, whenever a speaker utters an epistemically modified proposition *epistemic* (*p*) such as the examples in example (23), he signals to the hearer that *p* is not part of his knowledge. It would cause quite some confusion if the speaker were to resume the discourse saying "...since I know that *p* is the case". Canonically, the speaker would not know that *p* is false either. Likewise, he could not continue uttering "...although I know that *p* is not the case", at least if he uses an epistemic modal verb which is inflected for the indicative. Similar observations have been made by Erb (2001: 161), Krämer (2005: 60, 133), Fintel and Gillies (2010: 353), Kratzer (2011, 2012: 99) and Martin (2011: Sect. 3.1), and a detailed discussion is given in Section 6. To a lesser extent, a similar position is defended by Papafragou (2006: 1693). In the remainder of this study, it will be demonstrated that the relevant referent does not always have to be the speaker, e.g. in embedded clauses or in information seeking questions. Accordingly, this condition will be formulated with respect to a more abstract expression. In his *Lectures on Deixis* in the early 1970s, Charles Fillmore introduced the concept of a *deictic centre* (in the reprinted version: Fillmore (1997: 98)), which was subsequently developed in more detail by Levinson (1983: 64). The deictic centre is a referent who is identical to the speaker in the most prototypical context, but it can be instantiated by a referent other than the speaker of the actual utterance. A similar concept had already been suggested

by Bühler (1934: 102). According to his terminology, this referent is called *Origio*, and as Abraham (2011: xxxv) points out it can also be used to describe epistemic modality.

As will be shown in the Chapter 4, it is much more appropriate to formulate the condition for epistemic operators with respect to deictic centres rather than with respect to the actual speaker. For the sake of simplicity, this condition will be referred to as ‘*Condition on Deictic Centres (CoDeC)*’ here:

(25) **Condition on Deictic Centres (CoDeC)**

The use of an epistemic operator indicates that the embedded proposition is not part of the deictic centre’s knowledge.

Indeed, epistemicity turns out to be a property that does not apply to a lot of verbs in German. Apart from the traditional six modal verbs, only five more verbs come into consideration: *brauchen* ‘need’ (cf. Takahaši (1984: 21), Engel (1996), Askedal (1997a: 62)), *werden* (Vater (1975), Engel (1996), Enç (1996), Erb (2001: 176)), *scheinen* (Askedal (1998: 61), Wurmbrand (2001: 205)), *drohen* and *versprechen* (Askedal (1997b), Wurmbrand (2001: 205)). In some rare cases, even *lassen* exhibits an epistemic reading, as pointed out by Reis (2001: 308).

It is a matter of debate to what extent these items really belong to the same class as the six traditional modal verbs. First of all, there is no agreement as to whether all of these items indeed involve epistemic semantics. Öhlschläger (1989: 8) denies that *brauchen* allows for an epistemic interpretation, and Reis (2005b) argues that *drohen* and *versprechen* should be considered as aspectual verbs rather than epistemic modal verbs. Secondly, some authors assume that the class defining property for modality is poly-functionality. Therefore, they reject all verbal items that do not involve both types of modality. According to Öhlschläger (1989: 8), *brauchen* cannot be regarded as a modal verb since it lacks an epistemic reading, whereas *werden* has to be excluded because of the absence of a circumstantial interpretation. Since the question which of these items indeed involve epistemic modality requires a thorough investigation of empirical data, it will be postponed until Section 2.2, where each verb will be individually reviewed with respect to the CoDeC.

Even if the availability of an epistemic interpretation appears to be a powerful criterion, it does not apply equally to all of the six traditional items. Firstly, the canonical non-circumstantial uses of *wollen* ‘claim to’ and *sollen* ‘is said to’ differ from genuine epistemic modals. While the latter refer to a conclusion that is drawn by the speaker, the former express a claim by the subject referent (in the case of *wollen*) or some non-specified source (*sollen*). As Reis (2001: 294) points out, these instances of *wollen* and *sollen* are acceptable to a greater degree as non-finite forms than epistemic modals are. This might be due to the fact that they involve

more argument structure than their epistemic counterparts: *wollen* is a control verb and has a subject argument of its own, and *sollen* contains some unspecified covert argument. Hence, there are plenty of reasons to treat these latter readings separately from epistemic modality. This type of approach is furthermore supported by the observation that they might violate the CoDeC. Because they are always related to some claim, they will be referred to as *reportative* in the remainder of this study. Secondly, *dürfen* can never be interpreted epistemically unless it is inflected for past subjunctive (*dürfte*). As will be shown in Section 2.2.5, deontic *dürfen* and epistemic *dürfte* differ with respect to the modal force they carry: deontic *dürfen* is a prototypical possibility modal verb, epistemic *dürfte* appears to express a stronger modal force than that. Therefore, *dürfte* should be considered as an independent lexical item. Thirdly, most contemporary researchers treat *möchte* as an independent lexical item as well, such as Öhlschläger (1989: 7), Kiss (1995: 162), Fritz (1997: 103), Diewald (1999: 144), Axel (2001: 40) and Wurmbrand (2001: 183). Since none of them provides evidence that it is used with an epistemic interpretation, strictly speaking, it cannot be considered as a modal verb.

Regardless of these discrepancies, the availability of an epistemic interpretation turned out to be the most promising property to define a class. If the class of modal verbs is defined based upon epistemicity, only a small group of verbs comes under consideration. In the upcoming Section 2.2, all of these potentially epistemic verbs will be carefully reviewed with respect to the CoDeC. However, this approach will not result in a modal class with its traditional extension.

2.1.4 Conclusions

As has been shown, the six traditional modal verbs do not form a class that can empirically be justified. All of the criteria that come into consideration fail. This includes morphological criteria (preterite present paradigm, obligatory IPP), syntactic criteria (sub-categorisation of bare infinitives), and semantic criteria (availability of an epistemic interpretation). Therefore, a number of authors have already conceded that the class of modal verbs in its traditional extension is arbitrary and not well defined, such as Welke (1965: 12), Birkmann (1987: 5), Öhlschläger (1989: 7) and Fritz (1997: 14).

Thus, it becomes clear why different authors assume classes of modal verbs with diverging extensions. Some of these classes that have been a basis for influential theories are presented below:

- Ehlich and Rehbein (1972: 318) modal verbs in German: *müssen, können, dürfen, sollen, wollen, möchte, nicht brauchen, werden* – **without mögen**

- Kratzer (1981: 40) modal auxiliaries in German: *muss, kann, darf, soll, wird, mag, müsste, könnte, dürfte, sollte, würde, möchte* – **without *wollen***
- Kratzer (1991: 650) some modals: *muss, kann, soll, wird, dürfte*
- Fritz (1991: 46): epistemic modals in Contemporary German: *dürfte, kann, könnte, mag, muss, müsste, soll, will, wird*
- Wurmbrand (2001: 137) modal auxiliaries in German: *dürfen, dürfte, können, möchte, müssen, sollen, wollen* – **without *mögen***
- Erb (2001: 75) modal verbs in German: *können, müssen, dürfen, sollen, wollen, mögen, werden*

These authors are not always explicit as to why they exclude some of the verbs that are traditionally considered as modal verbs.

Since the traditional class of modal verbs cannot be empirically justified, one could argue for a mere extensional definition. This would be plausible if the six relevant verbs invariably involved auxiliary-like properties across the periods of German. But as it turns out, during the Old High German period, each of these verbs was grammaticalised to a different extent. Birkmann (1987) and Diewald (1999) agree that *sollen, wollen* and *mögen* were already highly frequent as grammaticalised verbs with infinitive complements and modal semantics in Old High German. In contrast, the remaining traditional modals *können* and *müssen* can hardly be found in such an auxiliary-like use in this period, or not at all, in the case of *dürfen*. As illustrated by Birkmann (1987), *dürfen* only started to select infinitive complements during the late Middle High German period. Apart from that, he points out that there is one more grammaticalised preterite present in Old High German that occurs with modal meaning: *eigan* ‘have’. As Wurzel (1984) shows, it appears that most of the preterite presents in Old High German involve too much lexical content in order to be considered as modal auxiliaries. This seems to contradict the position advocated by Fritz (1997: 13), who claims that all of the six traditional modal verbs already exhibited modal semantics in Old High German. But as was already discussed in Section 2.1.3.1, many authors use a rather fuzzy concept of modality. The two diverging positions thus do not need to be a contradiction at all.

This again demonstrates that the six traditional modal verbs did not become what they are as a chunk, but rather each verb had its own individual development, at its own pace. Meanwhile, some modals got lost (such as *eigan*) or are likely to get lost (such as *mögen*), but there are also new members in the group, such as *möchten*, which has already developed a full paradigm, at least in spoken language, as shown by Vater (2010).

The process of grammaticalisation turns out to be even more complex. When focusing on an individual verb, it is not obvious that it acquired all features of

auxiliary-hood at the same time. Even if *sollen* was already highly grammaticalised in Old High German, it is recorded with IPP only in the 16th century, more than hundred years after its first occurrence with a modal verb. As a consequence it appears that each property of auxiliary-hood develops independently, and the sequence of acquisition may differ from verb to verb.

A different attempt to argue for a complex definition that relies on a variety of features has been suggested by Zifonun (1997: 1253). She argues that modal verbs are the class of verbs that (i) select bare infinitives, (ii) lack imperative morphology, (iii) have a fully developed paradigm of tense morphology, (iv) lack arguments of their own and (v) are evaluated with respect to a conversational background. But as she acknowledges herself, none of these criteria hold without exceptions.

These observations lead to the conclusion that there is no reason at all to maintain the class of modal verbs in its traditional extension. But there is an alternative. Since the availability of an epistemic interpretation is restricted to a rather small group of verbs, it could serve to establish a homogeneous class. This type of approach has been taken by Engel (1996: 463) and Reis (2001: 312). As shown above, there are more verbs than the six traditional modal verbs that come into consideration for an epistemic interpretation, in particular *brauchen* and *werden*. As a consequence, they have to adapt the extension of their class of modal verbs accordingly. Both authors argue that there is a strong link between the selection of a bare infinitive complement and the availability of an epistemic reading, cf. Reis (2001: 308).

However, there are some minor discrepancies in the accounts of Engel (1996) and Reis (2001). First of all, they identify reportative modality contributed by *wollen* and *sollen* with epistemic modality, and second, there is only scarce evidence that *brauchen* indeed involves an epistemic reading that is subject to the CoDeC, as will be demonstrated in Section 2.2.9. Nevertheless, the analysis suggested by Engel (1996) and Reis (2001) will be adopted here. In the next section, it will be empirically reviewed in great detail, in order to find out which verbs are captured by this class definition.

Before concluding this section, one last plausible criterion for auxiliary-hood will briefly be addressed. As Grimm (1822: 851) argues, an essential property of auxiliaries is that they are more frequent compared to lexical main verbs. According to him, auxiliaries are ‘*verba welche sehr häufig gebraucht werden und statt ihrer lebendigen bedeutung abstracte begriffe annehmen*’ (‘verbs that are used very frequently and that involve abstract concepts rather than their original lexical meaning’). This can easily be tested by using a corpus.

Based on the data collected by Ruoff (1981), the most frequent verbs in German as spoken in Baden Württemberg (southwestern Germany) are the ones illustrated in Table 2.3. Once more, it turns out that the six traditional modal verbs behave

Tab. 2.3: Most frequent verbs in spoken German, according to Ruoff (1981), based on a corpus study comprising 500,000 word form tokens

sein ('be', PRF.AUX)	24.11 %	lassen ('let')	0.53 %
haben ('have', PRF.AUX)	22.72 %	stehen ('stand')	0.53 %
kommen ('come')	3.78 %	sehen ('see')	0.51 %
gehen ('go')	3.31 %	laufen ('run')	0.50 %
müssen ('must')	3.24 %	sollen ('shall')	0.48 %
werden ('become', PASS.AUX, FUT.AUX)	2.67 %	bringen ('bring')	0.41 %
machen ('make')	2.58 %	kaufen ('buy')	0.38 %
sagen ('say')	2.26 %	brauchen ('need')	0.37 %
können ('can')	2.01 %	ziehen ('draw')	0.36 %
wissen ('know')	1.21 %	dürfen ('may')	0.36 %
tun ('do')	1.19 %	glauben ('believe')	0.34 %
geben ('give')	1.1 %	helfen ('help')	0.33 %
wollen ('want')	0.83 %	meinen ('think')	0.30 %
schaffen ('manage')	0.82 %	...	
kriegen ('get')	0.78 %	möchten ('want')	0.08 %
fahren ('drive')	0.72 %	...	
heißen ('mean')	0.61 %	mögen ('like')	0.04 %
nehmen ('take')	0.58 %	...	

fairly differently. Whereas *müssen* and *können* are among the most frequent verbs, *mögen* is rather rare. As a consequence, frequency cannot serve to establish a class of modal verbs, either.

This data is not reliable for a couple of reasons. Firstly, the corpus is too small to allow for any significant results, as it only comprises 500,000 word form tokens. Secondly, the annotation is not precise enough. As will be shown in Section 2.2, some of the verbs, such as *können*, *mögen* and *wollen*, also involve transitive uses or finite *dass*-clauses. In these instances the lexemes mentioned above clearly behave like main verbs, and accordingly, they cannot be regarded as auxiliaries. Therefore, these occurrences should be ignored. But nevertheless, even if only modal verbs with infinitives are considered, they are not more frequent than other common main verbs. Finally, some of the verbs listed here are part of lexicalised idiomatic expressions, such as *heißen*, which frequently occurs in *das heißt* 'that is to say'. It is not obvious whether this can still be considered an occurrence of a main verb, or whether a reanalysis of the whole chunk to another category, such as a discourse marker, has taken place.

Altogether, this small survey might appear imprecise, but at least it gives us an idea of the different frequencies of the individual modal verbs. Nevertheless, it turns out that a remarkably high percentage of the most frequent verbs involves predicate complex formation. Maybe it is possible to recast Grimm's (1822) original

Tab. 2.4: Frequency of auxiliaries among all word form tokens, according to Kaeding (1897), based on a corpus study comprising 10,910,777 word form tokens

sein ('be', PRF.AUX)	2.83 %	müssen ('must')	0.28 %
haben ('have', PRF.AUX)	1.21 %	sollen ('shall')	0.22 %
werden ('become', PASS.AUX, FUT.AUX)	1.22 %	wollen ('want')	0.16 %
können ('can')	0.48 %	mögen ('like')	0.13 %
lassen ('let')	0.29 %	dürfen ('may')	0.09 %

idea in new terms: Whenever a verb is frequently used, it is likely to undergo predicate complex formation, in the spirit of Höhle (1978), Haider (1993) and Haider (2010), Kiss (1995) and Müller (2002).

Welke (1965: 19) refers to another corpus-based study on the frequency of modal auxiliaries that was carried out by Kaeding (1897). In his corpus that obviously consists of written texts, Kaeding extracts the following frequencies: *können* 52,384; *lassen* 32,143; *müssen* 30,350; *wollen* 27,834; *sollen* 23,910; *mögen* 14,406; *dürfen* 9 432.

This tendency is reflected in the results of the small corpus study carried out by Diewald (1999: 9). She investigated a corpus that contained 839 modal verbs. The frequency of the different verbs is as follows: *können* 319 (38,02%), *müssen* 182 (21, 69%), *wollen* 152 (18,12%), *sollen* 100 (11,92%), *mögen* 48 (5,72%) and *dürfen* 38 (4,53%).

Overall, similar pictures emerge: *können* and *müssen* are the most frequently used modal verbs, *mögen* and *dürfen* are used less frequently. However, there are some minor differences. There are a couple of ways to account for them. First of all, the corpora are composed of completely different registers: While Kaeding collected written language, Ruoff focused on spoken language of a variety spoken in southwestern Germany. Moreover, the data compiled by Kaeding is at least 100 years older than Ruoff's data. This might already explain why the frequency of *mögen* is much higher in Kaeding's corpus, since it was one of the dominant verbs in the earlier stages of German.

2.2 Case studies

All of the different verbs discussed so far come in different guises. In the present section, the syntactic distribution of these verbs will be systematically reviewed. The following patterns will be taken into consideration: Transitive verbs, verbs with directional phrases, control verbs and raising verbs. As will be shown in Chapter 3, circumstantial modality can be rephrased as event modification, and

epistemic modality as propositional modification. Authors who follow the tradition of Lyons (1977: 799) additionally distinguish between a ‘subjective’ and an ‘objective’ epistemic interpretation. However, as will be shown in Section 4.22, this distinction is misleading, and the assumption of a separate category ‘objective’ epistemic modality introduces more problems than it solves. Moreover, all of the different patterns under investigation will be illustrated by means of empirical data taken from the German reference corpus (DeReKo). It was created at the *Institut für Deutsche Sprache Mannheim*. At the time the study presented here was carried out, it comprised about two billion of word form tokens.

In order to illustrate the nature of the verbs discussed below, it is sometimes important to take a diachronic perspective. Accordingly, historical data will be discussed at places. Occasionally, a brief view of the diachronic development of these items may reveal deeper insights on their nature in Contemporary German.

2.2.1 *können*

Depending on its distribution, *können* contributes a couple of rather different semantic concepts, ranging from ability to epistemic possibility. In more syntactic terms, it can be realised as a transitive verb, as a control verb, and as a raising verb. In addition, it also occurs with verbless directional phrases. There is one particular use of *können* that reveals its underlying semantic nature: The quantificational use as discussed by Carlson (1977: 119) and Brennan (1993) and Brennan (1997). As Brennan (1993: 102) demonstrates, there is no plausible alternative to analyse this use of *können* as an existential quantifier (\exists) that binds the variable contributed by the indefinite NP. This will also be demonstrated below.

2.2.1.1 Transitive uses

There has been a great deal of discussion about the precise status of modal verbs without infinitival complements, as the instance of *können* in example (26) illustrates.

- (26) Die Bewerber können Russisch.
 the applicants can Russian
 ‘The applicants can speak Russian’

As Öhlschläger (1989: 68) discusses, the essential question is how the absence of an infinitive can be accounted for. Two conflicting approaches have been taken so far. On the one hand, these occurrences could be treated as ellipsis of the infinitive, and as a consequence, the remaining objects would be arguments of the elided verb. This approach has been suggested by Heyse (1822: 403), who argues

that the traditional modal verbs always require an infinitive complement. On the other hand, one could assume that these cases are instances of transitive verbs. Accordingly, the remnant objects would belong to the (modal) verb.

It is also important to ask what criteria can be used in order to understand the nature of these patterns. According to Öhlschläger (1989: 69), the essential question is whether the elided infinitive can be unambiguously determined. In the case of *wollen* without infinitive, it is always possible to insert the verb *haben* ‘have’ or *bekommen* ‘get’ in the gap. Therefore, Öhlschläger (1989) concludes that these cases of *wollen* involve ellipsis. As Öhlschläger (1989: 71) further argues, it is not so easy to reconstruct the elided infinitive in the case of *können*. Accordingly, he assumes that these instances are genuine transitive verbs.

If any of the cases discussed above indeed involve ellipsis, (i) it should be possible to specify its particular type. Since canonical cases of ellipsis affect rather syntactic configurations than specific predicates, it is expected (ii) that all types of embedded infinitives (ditransitive verbs, verbs with dative arguments, verbs with genitive arguments, etc.) are affected to the same extent, and (iii) it should have no impact on the grammaticality of the entire utterance whether the matrix predicate is passivised or not.

First, it appears that Öhlschläger (1989) uses a rather intuitive concept of ellipsis. In their typologies, Winkler (2006) and Merchant (2009) distinguish between six types of ellipsis. In contrast to the cases discussed here, all of their subtypes concern particular syntactic configurations that involve clausal conjunction. In particular, the elided phrase has an overt antecedent in the first conjunct. Moreover, there is no type that only affects an embedded infinitive without its complement. In gapping, the finite verb is elided (cf. 27) and, in VP-ellipsis, the entire VP (cf. 28; both examples taken from Winkler (2006)).

(27) Manny [plays]_i the piano and Anna _{-i} the flute.

(28) They [play the piano]_i but Anna doesn't _{-i}.

Modal verbs without an infinitive complement such as in (26) cannot be derived from VP-ellipsis in German for one additional reason. In contrast to English, the VP is phonetically not completely elided but realised as the VP-anaphora *es*, as López and Winkler (2000: 624) have pointed out. Thus, it becomes evident that the type of ellipsis that Öhlschläger (1989) has in mind would be completely different in nature. In a similar manner, *können* with an accusative NP cannot be analysed as a fragment in correspondance with the analysis suggested by Merchant (2009), as fragments are typically incomplete answers to *wh*-questions. Yet, it remains to be checked whether this pattern could be regarded as “situational ellipsis”, which is discussed by Schwabe (1994: 2).

Secondly, this type of ellipsis would look suspicious because it only affects a semantically restricted group of embedded infinitives. If the matrix predicate is *wollen*, the elided infinitive could only be identified with *haben* ‘have’ or *bekommen* ‘get’. In the case of *mögen*, there is only one verb that comes into consideration: *leiden* ‘suffer/be seriously affected’. *können* turns out to be the least restrictive matrix verb; the gap could be interpreted as ellipsis of *verstehen* ‘understand’, *sprechen* ‘speak’ or *machen* ‘make’ (and related concepts). It should be noted that all of these verbs that can potentially be subject to ellipsis are transitive verbs that contribute precisely a NP with accusative case. This is somewhat unexpected. Indeed, it should be possible to elide any type of infinitive, irrespective of its argument structure. Interestingly, ellipsis does not apply as soon as the transitive verb is replaced with a non-transitive synonym, as is illustrated by the contrast between examples (29) and (30). Likewise, an infinitive needs to be realised whenever the sole argument is a dative NP, like in the case of *helfen* ‘help’ (cf. 31).

- (29) Der Herbert kann Russisch (sprechen).
 the Herbert can Russian speak-INF
 ‘Herbert can speak Russian’
- (30) Der Herbert kann auf Russisch sogar über
 the Herbert can in Russian even about
 Wissenschaftsgeschichte #(sprechen).
 history.of.science speak-INF
 ‘Herbert is able to even talk about history of science in Russian’
- (31) Der Herbert kann dem David #(helfen).
 the Herbert can the-DAT David help-INF
 ‘Herbert is able to help David.’

This behaviour is completely unexpected under an analysis which assumes ellipsis of the infinitive complement, even for one that assumes lexical licensing. In a similar vein, this type of approach could not explain why *können* in example (29) can only refer to an ability, but never to a permission, a practical possibility or an epistemic possibility. The latter three readings are always possible if the *können* occurs with an infinitive complement. Finally, it is not clear why ellipsis can never apply to two-place predicates that select a dative predicate such as *helfen* ‘help’.

A further strong argument in favour of a transitive analysis comes from data about passivisation. In contrast to Welke (1965: 14) and Helbig and Buscha (2001: 116), who assume that modal verbs are generally incompatible with passivisation, instances of passivised forms of *können* can be found in corpora in which they behave like a prototypical transitive verb, such as in examples (32) or (33):

- (32) Auch dem Skispringer geht im Ernstfall eines
 even the ski.jumper goes in.the case.of.emergency a-GEN
 Wettbewerbs ein Gutteil von dem verloren, **was** erlernt,
 competition-GEN a bulk of that lost what learned,
 eingeübt ist – scheinbar so schlafwandlerisch **gekonnt**
 trained is apparently so somnambulistically can-PRT.PAS
wurde²³
 PAS.AUX

‘Even the ski jumper forgets most of what he has learnt, what he did in training and what he had apparently been able to do in his sleep.’

lit: what he apparently could do in his sleep

- (33) So kann beispielsweise im Handel gepunktet werden, wenn
 so can for.example in.the commerce scored PAS.AUX if
eine mitteleuropäische Sprache, eventuell auch Russisch,
 a central-European language maybe also Russian
gekonnt wird²⁴
 can-PRT.PAS PAS.AUX

‘For example, it can be advantageous in business if you can speak a central European language and perhaps even Russian’

lit: If you can speak a central European language

Defending an analysis that assumes ellipsis, one could argue that the infinitive has just been elided in these examples above. But, then, it is expected that cases of passives in which the infinitive is spelled out should be equally acceptable. As is shown in examples (4) and (35), this is clearly not the case:²⁵

²³ DeReKo: N97/DEZ.51590 Salzburger Nachrichten, 22/12/1997.

²⁴ DeReKo: P95/APR.14638 Die Presse, 28/04/1995.

²⁵ Some authors, such as Zifonun (1997: 1255), Erb (2001: 90) Wurmbrand (2001: 202), argue that passives with overt infinitives are indeed acceptable:

- (1) Auch sterben muß gekonnt sein/werden.
 also die-INF must can-PRT.PAS be-INF/PAS.AUX.PST.INF
 ‘You must learn the skill of death.’
- (2) ? Karriere machen wird von Frauen oft gewollt.
 career make-INF PAS.AUX.PST by women often want-PRT.PAS
 ‘Often Women want to make a career for themselves.’
- (3) ? Aufsätze schreiben wird heutzutage von keinem Schüler mehr
 essays write-INF PAS.AUX.PST nowadays by no pupil anymore
 gekonnt.
 can-PRT.PAS

- (34) * Das wurde **tun** gekonnt.
 that PAS.AUX.PST do-INF can-PRT.PAS
 Intended interpretation: ‘They were able to do it.’
- (35) * Russisch wird **sprechen** gekonnt.
 Russian PAS.AUX.PRE speak-INF can-PRT.PAS
 Intended interpretation: ‘They can speak Russian.’

Arguably, examples of passivised *können* without an infinitive complement are rare in written speech. This may be due to the fact that stative predicates such as verbs which encode a possession, knowledge or ability are not very compatible with passives in semantic respect, as the corpus data for English gathered by Gries and Stefanowitsch (2004: 108–110) show. One could therefore conclude that they are part of a phenomenon that is not relevant to grammatical description. How-

‘Pupils can no longer write essays in these days.’

However, in both cases, the grammaticality of the utterance is rather doubtful. Moreover, it is not clear whether the verbs *sterben*, *machen* and *schreiben* are indeed true infinitives rather than nominalisations. In all of these examples, the presence of an correspondingly inflected article *das* would considerably increase the acceptability of the sentence. Aside from that, all of these examples involve topicalisation of the infinitive complement and in the latter two cases, it is arguably a topicalisation of the entire VP. This also favours of an analysis that treats the topicalised infinitives as nominalisations that act as subject NPs. If (ii) and (iii) did indeed involve genuine infinitive complements, it is expected that the infinitive should be able to remain at the right periphery. In such a configuration, long passive should apply due to predicate complex formation and accordingly the NP *Aufsätze* would become the subject of the passive auxiliary *werden* and enter an agreement relation.

- (4) * Aufsätze werden heutzutage von keinem Schüler mehr schreiben
 essays PAS.AUX.PST nowadays by no pupil anymore write-INF
 gekonnt.
 can-PRT.PAS
 ‘Pupils can no longer write essays in these days.’

Furthermore, the option with the copula *sein* in Zifonun’s (1997) example is clearly preferred. This is not surprising, since *gekonnt* in the clause above could also be interpreted as adjective. If so the whole pattern with the copula *sein* could be interpreted as stative passive which is syntactically something completely different from the canonical *werden*-passive, as shown in Maienborn (2007). The option with *werden* is at best acceptable if *sterben* is interpreted as nominalisation and if a corresponding article is introduced.

All of these observations indicate that the instances of *können* and *wollen* in the passivisations above involve transitive patterns that select nominalised subject NPs. This is further supported by the fact that those of the traditional modal verbs that cannot be used in a transitive way, such as *müssen* would be even less grammatical in the environments above.

ever, the reason why they do not occur so frequently might be pragmatic. Besides *können*, there are typical transitive verbs that cannot often be found in passivised forms such as the preterite *wissen*, as has been pointed out by Adlung (1801: 1581). Nevertheless, passivised examples of *können* exist. And as opposed to other members of the traditional modal verb class, they prove much more acceptable. Similar contrasts have been shown by Hetland and Vater (2008: 104).

- (36) * Russisch wird (von allen) gemusst
 Russian PAS.AUX.PRE by everyone must-PRT.PAS
 'Everyone must speak Russian.'
- (37) * Russisch wird (von allen) gesollt
 Russian PAS.AUX.PRE by everyone shall-PRT.PAS
 'Everyone shall speak Russian.'
- (38) * Russisch wird (von allen) gedurft
 Russian PAS.AUX.PRE by everyone may-PRT.PAS
 'Everyone is allowed to speak Russian.'

In order to account for all of these contrasts, it is necessary to accept that there are transitive uses of *können*. This is further supported by the diachronic development of the traditional six modal verbs. As observed by Fritz (1997: 68), the predecessors of the traditional six modal verbs in Contemporary German occur occasionally with NP complements in Gothic. Birkmann (1987: 118) observes that the Gothic *þaurban* 'need', *kunnan*, *gamōtan* 'have freedom' and the Old High German *kunnan* and *thurfan* occur as lexical main verbs (Birkmann (1987: 161)). In a similar vein, Abraham (2004: 137) observes that in general non-finite complements have developed out of nouns. Whereas *zu*-infinitives have their origin in noun phrases marked with the dative case, bare infinitives emerged out of noun phrases with the accusative case. This is further enforced by Paul (1920: 95), who demonstrated that the bare infinitive complements originally go back to an NP-complement with accusative. Here are some examples for the transitive *kunnen* from Middle High German from the late 12th century:

- (39) oder swer hie welsche sprâche kan.²⁶
 or whoever here foreign-ACC language-ACC can
 'or whoever here can speak a foreign language'
- (40) ine kan decheinen buochstap.²⁷
 I.NEG-CL can no-ACC letter-ACC
 'I don't know any letter - I am illiterate.'

²⁶ Wolfram, *pârzival*, 115,27 (1200).

²⁷ Wolfram, *pârzival*, 115,27 (1200).

- (41) leider des enkan er niht.²⁸
 unfortunately this-GEN he NEG-CL.can NEG
 'Unfortunately, he is not able to do this.'
- (42) ruochts got, ich pin vor valsche vrî: // ich enkan
 wants.it God I am for deceitfulness free I NEG.CL-can
 decheinen widersaz.²⁹
 no-ACC hostility-ACC
 'God willing, I am free of any deceitfulness, I am not able to commit any hostility.'
- (43) got noch künste kan genuoc.³⁰
 God still arts-ACC can enough
 'God is full of powers.'

As is shown here, *kunnen* was originally a transitive verb and acquired its infinitive complement only in the course of time. This observation is further supported by Diewald (1999: 34), who assumes that the modal verbs in Contemporary German generally started out as lexical main verbs that belonged to the class of transitive verbs. In some rare cases, they occur even with passive morphology. This leads to the conclusion that these instances have to be analysed as true transitive verbs instead of an ellipsis of the infinitive. An approach in terms of ellipsis could only be maintained under the assumption that the ellipsis is licensed by the lexical semantic of the matrix verb. It would then be necessary to add to the respective lexicon entries the precise information under which conditions an ellipsis is licensed. In particular, this concerns the infinitives that can be elided under the respective matrix verb. It might turn out that this type of approach is fairly laborious. Unless there is no concrete attempt to investigate the precise conditions of licensing, it is safer to assume that all of these examples of the use of *können* without an infinitive are transitive uses, as has been assumed by Öhlschläger (1989: 69) and Erb (2001: 96). Finally, Becker (1836: 178) has already observed that the transitive use of *können* appears to have a very specific meaning: It always seems to express knowledge rather than a physical ability. This is on par with its etymology: originally, it referred to a mental knowledge rather than to a physical ability. For the latter purpose, its counterpart *mögen* was used.

²⁸ Wolfram, *pârzival*, 193,09 (1200).

²⁹ Wolfram, *pârzival*, 439,21 (1200).

³⁰ Wolfram, *pârzival*, 796,16 (1200).

2.2.1.2 Control infinitives with event modification

The essence of being a control verb is to contribute an independent subject argument. In the case of the traditional modal verbs, this subject argument is also the source of modality. According to Palmer (1986: 16) based on Wright, these cases are the proto-typical instance of dynamic modality. In its dynamic interpretation, *können* ascribes an ability to the matrix subject. Therefore, it needs to carry an independent subject argument to identify the ability-holder.

- (44) „Ich kann mir den Höhenflug nicht erklären”
 I can REFL the altitude.flight NEG explain-INF
 Wirtschaftsminister zu Guttenberg über seinen
 minister.for.economic.affairs zu Guttenberg about his
 Aufstieg.³¹
 advancement
 ‘“I can’t explain my success” Minister for Economic Affairs zu Guttenberg about his advancement.’
- (45) Ihre Bedeutung ist allerdings so sehr vom Zusammenspiel
 its meaning is however so much from.the interaction
 mit anderen Faktoren abhängig, dass nur professionelle
 with other factors dependent that only professional
 Penisleser sie richtig auslegen können.³²
 penis.readers they correctly interpret-INF can
 ‘However, its meaning is related to so many other factors that only professional penis readers can correctly interpret them.’

There are at least three ways to determine whether a verb is a control predicate or not. Control predicates (i) should not embed infinitives that lack a referential subject, (ii) they should not tolerate *de dicto* interpretations of quantified subjects and (iii) they should not exhibit voice transparency. Note, however, that all of the verbs under investigation here are ambiguous between numerous interpretations that often differ only in subtleties. In the case of *können*, there are at least three readings that partly overlap: The ability of the subject versus general possibility versus epistemic possibility. Whenever *können* denotes an ability of its subject referent, it cannot embed predicates without referential subject arguments (cf. 46) or predicates without subjects (cf. 47). Accordingly, if the raising test employed by Perlmutter (1970: 108), Brennan (1993: 41), Pollard and Sag (1994: 137), Axel (2001: 39), Wurmbrand (2001: 189), Erb (2001: 85), Müller (2002: 46, 2007: 256) cannot be ap-

31 DeReKo: NUN09/SEP.01543 Nürnberger Nachrichten, 14/09/2009.

32 <http://astrogenital.de/html/penislesen.html>, accessed in November 2010.

plied, which indicates that this use of *können* is a control verb. Nevertheless, the general possibility reading remains available.

- (46) # Es kann_{ABIL} schneien.
 it can snow-INF
 ‘Intended reading: It has the ability to snow.’
- (47) # ... dass getanzt werden kann_{ABIL}.
 that getanzt-PRT.PAS PAS.AUX.INF can.
 ‘Intended reading: ...that it has the ability to be danced’

Of course, whenever there is no referential subject argument present, the dynamic use of *können* fails to identify the bearer of the ability. Moreover, Stechow (2003: 203) points out that control verbs that take quantified subjects only allow *de re* interpretations in which the quantified subject takes scope over the modal operator. This is expected, since the control verb has a subject argument of its own and, as a consequence, this argument can never be interpreted as the subject of the embedded infinitive. In contrast, *de dicto* interpretations, in which the modal verb takes scope over the quantifier in subject position, are excluded. This is only possible if the quantified subject originally belongs to the embedded infinitive – a configuration that is excluded with control verbs:

- (48) Kein Student kann_{ABIL} Dänisch (sprechen).
 no student can Danish speak-INF
 OK: *de re*, $\neg > MV$, ‘For no student_i: x_i has the ability to speak Danish.’
 #: *de dicto* MV $> \neg$ ‘x_i has the ability that’

Finally, as has been demonstrated, among others, by Newmeyer (1970: 191), Jackendoff (1972: 105), Ebert (1976: 39), Öhlschläger (1989: 77), Pollard and Sag (1994: 136), Kiss (1995: 163), Diewald (1999: 62), Erb (2001: 92), Reis (2001: 301, 2005: 139), Stechow (2003: 205) and Hornstein (2003: 8), control verbs are not transparent with respect to voice. A sentence which contains an active verb (cf. 49a) always expresses the same proposition as its the corresponding sentence which contains the corresponding passivised verb (cf. 49b). Whenever they are embedded by a control predicate, the subject of the clause is assigned an additional semantic role, the one that is contributed by the control predicate. Note that active and passivised clauses differ with respect to the argument that is realised as the subject. In each case a different argument will be semantically marked as the subject argument. Therefore, control predicates are not transparent with respect to voice.

- (49) a. Der Reinhold bezwingt den Nanga Parbat ohne
the Reinhold conquers the-ACC Nanga Parbat without
Sauerstoffgerät.
oxygen.apparatus
'Reinhold conquers the Nanga Parbat without oxygen apparatus.'
- b. Der Nanga Parbat wird vom Reinhold ohne
the-NOM Nanga Parbat PASS.AUX by.the Reinhold without
Sauerstoffgerät bezwungen.
oxygen.apparatus conquer-PPP
'The Nanga Parbat is conquered by Reinhold without oxygen apparatus.'
- (50) a. Der Reinhold kann_{ABIL} den Nanga Parbat ohne
the Reinhold can the-ACC Nanga Parbat without
Sauerstoffgerät bezwingen.
oxygen.apparatus conquer-INF
'Reinhold has the ability to conquer the Nanga Parbat without oxygen apparatus.'
- b. # Der Nanga Parbat kann_{ABIL} vom Reinhold ohne
the-NOM Nanga Parbat can by.the Reinhold without
Sauerstoffgerät bezwungen werden.
oxygen.apparatus conquer-PPP PASS.AUX-INF
'Intended reading: The Nanga Parbat has the ability to be conquered by Reinhold without oxygen apparatus.'

Returning to the ability reading of *können*, the source of the ability is identified with *Reinhold* in example (50a). In contrast, the source of ability would be assigned to the *Nanga Parbat* in example (50b). Since it is not clear whether mountains can be regarded as legitimate bearers of abilities, the interpretation of example (50b) is rather odd. A similar discussion is summarised by Reis (2001: 301). In essence, the two sentences are not semantically equivalent; accordingly, *können*_{ABIL} has to be considered as a control verb. In a similar vein, Wurmbrand (1999: 604, 2001: 199) argue that control verbs generally fail to embed passivised complements. Brennan (1993: 45) applies a similar test that employs symmetric predicates instead of passivisation.

There is a widespread consensus to analyse the ability reading of *können* as a control structure, as has been suggested by Welke (1965: 49), Stechow and Sternefeld (1988: 429), Wurmbrand (2001: 171), Axel (2001: 40), Reis (2001: 302) and Erb (2001: 78).

2.2.1.3 Raising infinitives with event modification

There has been a great debate on the syntactic nature of non-epistemic (circumstantial or root) modal verbs. As Reis (2001: 300) demonstrates, three main positions can be distinguished. Originally, all circumstantial modal verbs were considered to be control verbs. In contrast to that, epistemic modal verbs were treated as raising verbs. The basic idea dates back to Ross (1969: 86), who assumes that root and epistemic modal verbs are derived from different deep structures. Whereas root modals originate from two place predicates, epistemic modals involve one place predicates. This idea was further developed by Jackendoff (1972: 102), Brennan (1993: 25), Stechow and Sternefeld (1988: 429), Diewald (1999: 62) and, finally, Abraham (2001: 18; 2002: 36; 2005: 241, 257, 261). Often, these approaches have not been systematically developed and remain rather superficial. In particular, this concerns Jackendoff (1972: 102) and Stechow and Sternefeld (1988: 429), who discuss only one or two items, and who fail to give an exhaustive description of the entire group of the traditional modal verbs. Most of these authors acknowledge that circumstantial modals can also be found in raising configurations. Following the observations discussed by Newmeyer (1970: 191), Jackendoff (1972: 105) was already aware that, with respect to voice transparency, modal verbs behave like raising verbs whenever the object of the embedded infinitive is inanimate, such as the *Nanga Parbat* in example (50). As noticed by Stechow and Sternefeld (1988: 446), each modal verb can also be realised as a raising pattern. Finally, Brennan (1993: 27) concedes that ought-to-be-deontics have to be analysed as raising verbs, following the assumption made by Feldman (1986: 177), who argues that they must be one-place predicates. This type of approach faces additional difficulties since the use of (reportative) *wollen*, which is traditionally considered an epistemic modal verb, involves a control pattern. This will be thoroughly discussed in Section 2.2.3.

A second tradition, represented by by Welke (1965: 49) and Höhle (1978: 81, 84), argues that most circumstantial modals are even one place predicates without a subject argument of their own. This approach has been adopted and developed by Öhlschläger (1989: 105), Palmer (1990: 47), Geilfuß (1992), Kiss (1995: 163), Axel (2001: 40), Reis (2001) and Erb (2001: 73). According to these authors, some circumstantial modals such as volitional *wollen* and *möchte* are nevertheless to be analysed as control patterns. The third position defended by Wurmbrand (1999, 2001: 201) and Gergel and Hartmann (2009: 327) assumes that modal verbs are always raising verbs. Whereas Wurmbrand (2001: 201) analyses volitional verbs like *wollen* and *möchte* rather as main verbs, Gergel and Hartmann (2009) assume that they involve oblique raising into theta positions. Finally, Barbiers (2002: 67)

argues for an intermediate position claiming that all circumstantial modals occur with both patterns: control and raising.

Returning to *können*, it appears that its use as a raising verb covers a broad range of different readings. Notably, it denotes a practical possibility. Moreover, it can involve deontic permission readings and quantificational readings. Applying the same diagnostics for the existence of a subject argument that were discussed in the last section, it turns out that these instances of *können* behave fairly differently. First of all, they do not require referential subjects any longer and as a consequence the tests proposed in the preceding section can be applied with out any problem. Such instances can also be found in corpora, as is indicated in examples (55)–(56).

- (51) Es kann_{PERM} (hier ruhig) schneien.
 it can here PAR snow-INF
 ‘It’s okay if it snows here.’
- (52) ... dass (ruhig) getanzt werden kann_{PERM}.
 that PAR getanzt-PPP PASS.AUX-INF can.
 ‘It’s okay if you dance here’
- (53) Es kann_{POSS} (hier manchmal) schneien.
 it can here PAR snow-INF
 ‘It can snow here from time to time.’
- (54) ... dass (hier manchmal auch) getanzt werden kann_{POSS}.
 that dance-PPP PASS.AUX-INF can.
 ‘People dance here from time to time.’
- (55) Reisezeit: Der Montblanc lässt sich am besten von Ende
 travel.season the Mountblanc let RELF at.the best from end
 Juni bis Anfang September umrunden. Auch im Hochsommer
 June until begin September round also in.the midsummer
 kann es schneien.³³
 can it snow-INF
 ‘Travel season: for those who want to hike around the Montblanc, it is recommended to envisage this tour between the end of June and the begin of September. But it can also snow in midsummer.’

33 DeReKo: RHZ11/AUG.09341 Rhein-Zeitung, 09.08.2011.

- (56) Zwar sprechen viele Holländer gut Deutsch, dennoch kann es
indeed speak many Dutch well German yet can it
Mißverständnisse geben, wenn Gleiches unterschiedlich
misunderstandings give-INF if same differently
gedeutet wird.³⁴
interpreted is

'Many Dutch may speak German very well, but there can be misunderstandings if the same things are interpreted in a different manner.'

- (57) In diesem Raum kann gewohnt, gefeiert oder geschlafen
in this room can live-PPP celebrate-PPP or slept-PPP
werden.³⁵
PASS.AUX-INF

'In this room, it is possible to live, to celebrate or to sleep.'

In its permission reading, *können* has a meaning similar to *dürfen*. The presence of the modal particle *ruhig* in examples (108)–(109) indicates that the interpretation of the possibility verb *können* has to be a deontic (permissive) one, as has been demonstrated by Grosz (2014: Sect. 5.1): As soon as *ruhig* is used in an utterance a modal possibility operator cannot be interpreted in an epistemic way. The possibility reading of *können* can be paraphrased in terms of temporal quantification, such as 'From time to time, it happens that...', this interpretation is highlighted by the presence of the adverb *manchmal* 'occasionally' in examples (53)–(54).

As soon as *können* carries no subject arguments of its own, *de dicto* readings become available, as has been illustrated by Wurmbrand (1999: 606, 2001: 192) and Stechow (2003: 203). This type of interpretation obviously needs to be accompanied by a corresponding intonation contour, in which the negative subject quantifier is set off by a small break and receives a high pitched accent. Likewise, Blüh-dorn (2012: Sect. 8.5/364) has pointed out that a narrow scope interpretation of the negation becomes more likely once it bears a high pitch accent (H*L).

- (58) Es kann (auch) | KEIN_{H*L} Student kommen.
EXPL can (also) no student come-INF

OK: de re, $\neg > MV$, 'For no student_i it is allowed/possible that he_i comes.'

OK: de dicto $MV > \neg$ 'it is allowed/possible that no student comes'

De dicto readings with the deontic pattern *können* are also possible with existential quantifiers. In contrast to examples (58), such configurations can easily be found in corpora. In example (59), the deontic possibility operator takes scope

34 DeReKo: R98/SEP.75404 Frankfurter Rundschau, 19.09.1998.

35 DeReKo: M10/APR.26150 Mannheimer Morgen, 06.04.2010.

over the existential quantifier *ein Elternteil* ($\square > \exists$). The possibility to access the benefit is granted for one of the two parents and it is not specified whether it has to be the mother or the father.

- (59) Die staatliche Leistung wird maximal 14 Monate gezahlt. Ein Elternteil kann sie aber längstens ein Jahr in Anspruch nehmen. Die weiteren zwei Monate gibt es nur, wenn dann der Partner das Kind betreut.³⁶
 the public benefit is maximally 14 months paid a parent can she but at most a year in claim take-INF
 Die weiteren zwei Monate gibt es nur, wenn dann der Partner das Kind betreut.³⁶
 the further two month gives it only if then the partner the child cares

‘The public benefit will be paid for maximally 14 months. A parent can draw it for no longer than a year. The extra two months are only available, if the other partner takes care for the child during that period.’

Finally, the permission reading and the possibility reading are both transparent for voice. Both examples (60) and (61) turn out to be synonymous. In order to unambiguously trigger the respective reading, more plausible contexts have been chosen. However, as Reis (2001: 302) illustrates, the context of the discourse can have an impact on this diagnostic, which raises some doubt about the reliability of this test.

- (60) a. Der Reinhold kann_{PERM} den Nanga Parbat ohne Sondergenehmigung bezwingen.
 the Reinhold can the-ACC Nanga Parbat without special.permission conquer-INF
 ‘Reinhold may conquer the Nanga Parbat without special permission.’
- b. Der Nanga Parbat kann_{PERM} vom Reinhold ohne Sondergenehmigung bezwungen werden.
 the-NOM Nanga Parbat can by.the Reinhold without special conquer-PPP PASS.AUX-INF
 ‘The Nanga Parbat may be conquered by Reinhold without special permission.’
- (61) a. Der Kräuterpfarrer kann_{POSS} die Leserbriefe schon mal persönlich beantworten.
 the herbs.priest can the-ACC letters.to.the.editor also PAR sometimes personally answer-INF
 ‘Sometimes, the herbal priest personally answers the letters to the editor.’

³⁶ DeReKo: M07/DEZ.04402 Mannheimer Morgen, 15.12.2007.

- b. Die Leserbriefe können_{POSS} vom Kräuterpfarrer
 the-NOM letters.to.the.editor can by.the herbs.priest
 auch schon mal persönlich beantwortet werden.
 also PAR sometimes personally answer-PPP PASS.AUX-INF
 ‘Sometimes, the letters to the editor are answered by the herbal priest himself.’

All of these diagnostics illustrate that some of the circumstantial interpretations of *können* are indeed to be analysed as raising predicates. It seems to be possible that all of these different readings are derived from one general reading. This is supported by diachronic evidence. As Fritz (1997: 14) demonstrates, the permission reading developed out of practical possibility meaning. A similar position is put forth by Öhlschläger (1989: 156), who argues that permission reading is only secondary and is generated by a specific conversational background. As can be clearly seen, the last remaining reading can also be related to the practical possibility reading.

Carlson (1977: 119) and Brennan (1993: 97) discuss instances of the English modal *can* in which it quantifies over elements that are smaller than worlds. In particular, they focus on quantification over individuals (cf. 536) or situations. These readings can be equally found with its German counterpart *können* in (63) and (64):

- (62) A basketball player can be short.
- (63) Ein CSU-Politiker kann evangelisch sein.
 a CSU.politician can protestant be-PRF.AUX-INF
 ‘A CSU politician can be a protestant.’
- (64) Ein CSU-Politiker kann auch durchaus mal die Ehe
 a CSU.politician can also sometimes once the marriage
 gebrochen haben.
 break-PPP have-INF
 ‘There are some CSU politicians who have committed adultery.’
- (65) Ein derartiger Blutwert kann genetisch bedingt, aber
 a such blood.value can genetically determine-PPP but
 auch auf Doping mit EPO oder Eigenblut zurückzuführen sein
 also on doping with EPO or own.blood to.backtrack-INF be-INF
 – derartige Dopingfälle gab es im Langlauf bereits
 such doping.cases gave it in cross.country already
 zuhauf.³⁷
 in.masses

‘Such a blood parameter can be congenital but also due to doping with EPO or an autologous transfusion – in cross country, countless such cases of doping have already occurred.’

- (66) Ein aktiv gemanagter Fonds kann aber durchaus besser an actively managed fund can yet definitely better abgeschnitten haben. Sie federn extreme Bewegungen ab und perform-PPP have-INF they absorb extreme movements off and haben vielleicht nur 15 bis 18 Prozent verloren. Viele have may only 15 to 18 percent lost many Fondsmanager haben seit Jahren gezeigt, dass ihre aktiv fonds.managers have since years shown that their actively gemanagten Fonds besser laufen als passive.³⁸ managed funds better run than passive

‘A fund which is actively managed can have performed better. They absorb extreme price movements and they have possibly lost only 15–18 percent. Many managers of funds have demonstrated throughout the last years that their actively managed funds perform better than those that are managed passively.’

- (67) Drei ihrer Künstler hat die Galeristin bereits während ihres three her-GEN artists-GEN has the gallery owner during their Studiums an der Mainzer Kunsthochschule kennen gelernt. „Ein studies at the Mainz Art.school know learnt a Künstler kann auch schon mit 30 einen Formenkanon gefunden artist can also already with 30 a form.canon find-PPP haben, den er entwickeln will.“³⁹ have-INF that he develop-INF wants

‘The gallery owner met three of her artists during their studies at the art school in Mainz: “An artist can have found his style already at the age of 30.”’

- (68) Wer danach dieselben Türen berührt und dann ein Eis isst, who after the.same doors touches and then a ice.cream eats kann sich schon angesteckt haben.⁴⁰ can self already infect-PPP have-INF

‘Some of those who touched the same doors and went to eat ice cream can already have been infected.’

Essentially, the semantic contribution of *können* is that it existentially quantifies over the sort of individual denoted by the subject NP: There are at least some CSU

37 DeReKo: NUZ06/OKT.02424 Nürnberger Zeitung, 25/10/2006.

38 DeReKo: M08/SEP.70220 Mannheimer Morgen, 09/09/2008.

39 DeReKo: RHZ07/APR.07409 Rhein-Zeitung, 10/04/2007.

40 DeReKo: RHZ09/OKT.00336 Rhein-Zeitung, 01/10/2009.

politicians for which the property encoded by the predicate holds. In contrast, the practical possibility readings discussed above seem to be the same phenomenon that Brennan (1993: 97) has in mind when she talks about quantification over situations. Some authors, such as Portner (2009: 134), suggest a different classification, according to which quantificational modals are a subtype of dynamic modality.

Summing up, there is actually no need to argue about the existence of circumstantial modal verbs with raising patterns. First of all, there is a lot of empirical evidence ranging from the selection of non-referential subjects to the scope ambiguity of quantifiers, and finally to the transparency with respect to voice. Moreover, it has been demonstrated that even the often quoted main proponents of the control versus raising approach, Jackendoff (1972: 105), Stechow and Sternefeld (1988: 446) and Brennan (1993: 27) acknowledge that there are cases of circumstantial modals with underlying raising pattern. Furthermore, it has been shown that their approaches are never exhaustive and comprise only one or two modals. Therefore, it should not be all too surprising if they reach very different conclusions about the nature of circumstantial modals.

Yet, it is not clear whether there are more circumstantial modals with control patterns apart from the obvious cases such as the ability reading of *können*, and the volitional verbs *wollen*, *möchte* and *mögen*. As Feldman (1986: 179) discusses, deontic modality comprises at least two subtypes, whereas ‘the ought-to-do involves a relation between an agent and a state of affairs. The ought-to-be involves a property of state of affairs’. In a similar fashion, Abraham (2001: 18, 2002: 36 2005: 241, 257, 261) and Barbiers (2002: 67) argue that deontic modals such as the permission reading of *können* are generally possible as control verbs. Brennan (1993: 45) applies a test similar to the voice transparency that is based on symmetric predicates. The result could be interpreted in favour of the existence of deontic control verbs. In a similar vein, Diewald (1999: 62) presents analogous examples of the voice transparency test. Reis (2001: 302), however, relativises the reliability of this diagnostic.

2.2.1.4 Raising directional phrases with event modification

As already observed by Paul (1898: 296 §221), the traditional six modal verbs including *lassen* ‘let’ and *helfen* ‘help’ systematically embed directional phrases in the absence of a corresponding infinitive. He concludes that the lack of the infinitive cannot be explained in terms of an ellipsis, as has been proposed by some authors, such as Heyse (1822: 403). In a similar vein, Zifonun (1997: 1256), Erb (2001: 94), Vater (2004: 18), Szumlakowski-Morodo (2006), Hetland and Vater (2008: 102) and Ørsnes (2007) argue that the traditional six modal verbs in Ger-

man alternatively select directional PP or AP complements. This phenomenon is not restricted to German but also occurs in other Germanic Languages, such as Dutch (cf. Barbiere (1995) and Barbiere (2002), Riemsdijk (2002)), Danish (cf. Jespersen (1931: 238)), Norwegian (cf. Hetland and Vater (2008: 102)) and, as Wilder (2008: 249) points out, in a number of Slavic languages such as Czech, Slovak, Slovenian, Serbian, Bulgarian and Russian. Furthermore, Denison (1993: 305) has demonstrated that these patterns were also available in earlier stages of English; Fritz (1997: 72) provides evidence for the existence of them in Old and Middle High German.

Barbiere (1995: 151, 2002: 53) presents a whole range of serious obstacles to be overcome for an ellipsis account for Dutch: (i) essentially, it is hard to account for patterns consisting of an inanimate subject + modal verb + directional phrase, and (ii) it is not obvious why modal verbs with verbless directional phrases can never be interpreted epistemically. Szumlakowski-Morodo (2006: 327) presents an analogous example for German:

- (69) Der Brief muss zur Post (#gehen) / (#gebracht werden)
 The letter must to.the post.office go brought PAS.AUX
 'The letter must be taken to the post office'

Neither of the alternatives is appropriate. The first case is problematic because *gehen* 'go', as used in example (69), prototypically requires an animate subject. Nevertheless, it would in principle be possible to introduce this verb of movement, but it would also subtly affect the semantic interpretation of the utterance. Barbiere (1995: 155) makes a similar observation for Dutch. Even if the second solution is more adequate from a semantic perspective, it is more implausible from a syntactic point of view. First of all, it presupposes the ellipsis of the passive auxiliary, an assumption which lacks empirical justification, since *werden* cannot be omitted in contemporary German. Moreover, the agent argument in a passivised utterance can usually be expressed by a *von*-PP. However, this option is not available in example (69), as pointed out by Barbiere (1995: 152).

Analogous to Barbiere (1995: 153, 2002: 54), Vater (2004: 18) and Hetland and Vater (2008: 102) observe that modals with verbless directional phrases are restricted to a non-epistemic interpretation.

- (70) Hans muss ins Feld.
 Hans must into.the field PAS.AUX
 'Hans has to go into the field.' (deontic)
 '*Hans must go into the field.' (epistemic)

Finally, Szumlakowski-Morodo (2006: 342) discusses a third challenge for an ellipsis account. Whenever one of the traditional six modal verbs selects a verbless

directional phrase, it will be realised as a *ge*-participle, rather than as IPP in perfect tense environments, in contemporary Standard German. In some southern varieties, however, the IPP is nevertheless available in these contexts.

- (71) ... dass er nachhause gemusst hat.
 that he home must-PPP(*ge*) PRF.AUX
 '...that he had to go home.'

As was pointed out in Section 2.1.1.2, the *ge*-participle is ungrammatical if the traditional six modal verbs embed an infinitive. Therefore, it is fairly likely that the use with a verbless directional phrase in example (71) must be something else.

Since an analysis of verbless directional phrases in terms of ellipsis turns out to be inadequate, an alternative explanation becomes necessary. Paul (1898: 296 §221) already explicitly suggested that directional phrases can be considered as predicates:⁴¹

'[...] *er ist weg*, *er ist nach Rom*, die nicht anders aufzufassen sind als *er ist in Rom*, dh. *weg* und *nach Rom* sind als Prädikate zu nehmen *ist* als Kopula. Desgleichen *er ist von Rom*, *woher ist er?*.

In a similar vein, Barbiers (1995: 162, 2002: 57) and Erb (2001: 95) assume that the verbless directional phrases under discussion can be analysed as small clause complements; Ørsnes (2007) develops an analogous solution within LFG.

There have only been few attempts to develop an analysis that assumes ellipsis of the infinitive. As already shown in Section 2.2.1.1, the modal verbs that lack infinitive complements differ crucially from canonical ellipsis. As pointed out by Ørsnes (2007: Sections 3 & 4.2), the only solution would be to assume an entry of a specific empty verb in the lexicon. This is exactly the solution Riemsdijk (2002: 187) opts for. He argues that, in virtue of being functional categories, modal verbs in Germanic languages can licence the empty light verb *GO*. Wilder (2008) adapts this proposal and extends it to other languages and related phenomena. From the discussion above, it has become clear that any account that assumes an empty verb faces a whole range of challenges. Some of them can be circumvented by means of a number of theory-specific stipulations, but in the end Riemsdijk (2002: 166) concedes that his approach cannot explain why modal verbs with verbless directional phrases are always interpreted circumstantially. Moreover, he explicitly restricts his analysis to modal verbs, cf. Riemsdijk (2002: 144). In contrast,

⁴¹ [...] *er ist weg* 'he is away', *er ist nach Rom* 'he is to Rome', they have to be interpreted in the same way as *er ist in Rom*, 'he is in Rome', accordingly *weg* 'away' and *nach Rom* 'to Rome' have to be considered as predicates, *ist* 'is' as copula. In a similar fashion, *er ist von Rom* 'he is from Rome', *woher ist er?* 'where is he (from)?' [own translation]

Öhlschläger (1989: 64) assumes that the verbless directional phrases are the result of an indefinite ellipsis, as suggested by Shopen (1973: 68). In Shopen's (1973) proposal, however, indefinite ellipsis includes cases in which the elided element cannot be recovered from the ongoing discourse, such as the sentence 'John received a package (from Canada)'. But Shopen (1973: 65) explicitly points out that indefinite ellipsis is a subtype of constituent ellipsis, 'where a predicate is expressed without all its arguments'. This phenomenon only concerns cases in which an entire argument is elided. Yet, this does not hold for modal verbs that occur with verbless directional phrases. Adopting the analysis suggested by Shopen (1973), we would expect the whole infinitival VP to be suppressed, including its head, the motion verb and the dependent directional phrase. This actually underpins Öhlschläger's original claim. Finally, Behaghel (1924) does not become explicit as to whether he considers an account in terms of ellipsis an appropriate solution. In some passages, he seems to favour an ellipsis account (p. 369) in others he seems to adopt Paul's (1898) predicate analysis (p. 179).⁴²

Since Paul (1898: 296 §221) already demonstrated that the selection of verbless directional phrases is not limited to the traditional modal verbs, any solution should also be applicable to the remaining verbs that come into consideration. However, a couple of them cannot be captured by an analysis in the spirit of Riemsdijk (2002). On the one hand, there are verbs like *helfen* 'help'. From a semantic perspective, a predicate like the empty *GO* suggested by Riemsdijk (2002) seems to be roughly compatible with the directional phrase in (72). But for some strange reason, *helfen* loses its usual ability to alternatively combine with bare infinitive complements once it selects a directional phrase. In case the speaker wants to express a non-finite complement, the infinitival marker *zu* becomes obligatory. This is remarkable, since usually, *helfen* alternatively selects bare infinitives and *zu*-infinitive complements, as has been shown by Askedal (1989: 5). In order to maintain an ellipsis account, it would become necessary to additionally assume the existence of an empty infinitive marker *zu*, or the existence of an empty *zu*-infinitive.

On the other hand, there are verbs such as *bekommen* 'get' and *kriegen* 'get' that occasionally select verbless directional phrases or verb particles in an ana-

42 Behaghel (1924: 179): *Es versteht sich, daß auch die Hilfszeitwörter behandelt werden, die infolge der Ersparung eines Bewegungsverbs selbst dessen Bedeutung erhalten haben.* ('It is clear that the auxiliaries will also be treated, which have acquired the meaning of a predicate of motion due to the deletion of this predicate' [own translation].)

Behaghel (1924: 369): *Wenn die Ergänzung des Hilfszeitwort erspart wird, so kann das Partizip die Infinitivform beibehalten oder die echte Partizipform annehmen.* (If the complement of an auxiliary is deleted, the participle can keep its form as an infinitive or adopt the genuine form of a participle [own translation].)

logous function, as is illustrated by examples (73)–(76). In Standard German, it is not possible to insert any verb after the directional phrase. Some northern varieties allow for that option, but in that case the meaning will always be more specific in comparison to the variant without the verb of motion:

- (72) Ich helfe Dir auf den Baum (**zu** kommen) (**zu** #gehen)
 I help you-DAT on the table to come-INF to go-INF
 'I help you to climb the tree'
- (73) Neunzig Minuten lang bekam keiner den Ball ins Tor
 ninety minutes long got nobody the ball into goal
 (*gegangen)/ (*gekommen).⁴³
 go-PPP(ge)/ come-PPP(ge)
 'During the ninety minutes, nobody managed to get the ball into the goal.'
- (74) Er kriegte ihn nicht hoch, aber liebte mich.⁴⁴
 he got him NEG up but loved me
 'He could not get it up, but he loved me.'
- (75) Alle kriegen ihren besten Freund hoch, nur nicht der
 all get their best friend up only NEG the
 bedauernswerte Victor-Emmanuel Chandeise.⁴⁵
 unfortunate Victor-Emmanuel Chandeise
 'Everybody could get it up but the unfortunate Victor-Emmanuel Chandeise could not.'
- (76) Paul kriegt keinen Ton heraus, er hat längst keine Stimme
 Paul gets no sound out he has long no voice
 mehr.⁴⁶
 anymore
 'Tom can't get a sound out; he lost his voice a while ago.'

To conclude, in view of the evidence presented above it is not plausible to assume that modal verbs that occur with verbless directional phrases involve ellipsis of a predicate of motion. The most revealing fact is that these types of complements are restricted to modals with circumstantial and or dynamic interpretation only. This also holds at least for the remaining Germanic languages, as shown by Hetland and Vater (2008: 102) for Norwegian and Barbiers (1995) and Barbiers (2002) for Dutch. This is hard to account for with an analysis that assumes ellipsis.

⁴³ DeReKo: RHZ05/OKT.11553 Rhein-Zeitung, 10/10/2005

⁴⁴ DeReKo: 97/SEP.22636 Zürcher Tagesanzeiger, 19/09/1997; Allen Ginsbergs letzte Worte.

⁴⁵ DeReKo: K00/JUL.55029 Kleine Zeitung, 23/07/2000.

⁴⁶ DeReKo: RHZ97/DEZ.00540 Rhein-Zeitung, 01/12/1997.

Assuming that directional phrases can be interpreted as predicates, a solution can easily be obtained. According to the *rule for coherence* formulated by Bech (1955: 65), verbs that sub-categorise bare infinitive complements or past participles obligatorily form a predicate complex (verbal cluster). Interestingly, almost all verbs of this class may alternatively select verbless directional phrases. In contrast, motion verbs occasionally take bare infinitive complements or, in rare cases, past participles, as was shown in Section 2.1.2.1:

- verbs selecting bare infinitives: *können*, *müssen*, *dürfen*, *sollen*, *mögen*, *brauchen*, *lassen* ‘let’, *würde gerne* ‘would like to’, *helfen* ‘help’, *trauen* ‘dare’, *haben* ‘have’, *sein* ‘be’, *tun* ‘do’
- verbs selecting past participles: *gehören* ‘belong/should.be’, *bekommen* ‘get’, *kriegen* ‘get’, *sein* ‘be’, *haben* ‘have’
- motion verbs selecting bare infinitives: *kommen* ‘come’, *gehen* ‘go’, *schicken* ‘send’, *senden* ‘send’
- motion verbs selecting past participles: *kommen* ‘come’, *bringen* ‘bring’⁴⁷

As it turns out, there are three types of predicates in German that always trigger predicate complex formation: Those which select for bare infinitives, past participle or directional phrases. It is evident that each of them involves a particular semantic specification. Obviously, only bare infinitives fulfil the prerequisites for an epistemic interpretation, as observed by Reis (2001: 310). Possibly, the crucial property of bare infinitives is to encode states. As Barbiers (2002: 59) illustrates, verbless directional phrases always denote a polarity transition and correspond rather to perfective or eventive predicates. Of course, as already shown by Bech

⁴⁷ Vogel (2005) discusses the pattern *kommen* + past participle. However, this phenomenon does not seem to be restricted to *kommen*. In addition to the patterns discussed by Vogel (2005), verbs of caused movement, such as *bringen* ‘bring’, are observed in analogous patterns.

- (1) Soldaten bringen den Bauern geschleppt.
 soldiers bring the farmer drag-PPP
 ‘Soldiers drag the farmer along.’
 Friedrich von Schiller Wallensteins Lager, 10. Auftritt (1799).
- (2) Was bringst’n da wieder geschleppt, sag emal?
 what bring.PART there again drag-PPP say once
 ‘An’ what’ that you’ve got hold of now?’
 Gerhart Hauptmann Die Weber V (1893).

At this point, I wish to thank Peter Sprengel, who helped me with some puzzles in the translation from Silesian into German. A similar example is provided by Schoetensack (1856: 293).

(1955: 84), there are also verbs that select *zu*-infinitive complements and nevertheless obligatorily form a predicate complex, such as *brauchen* or *pflegen* 'be wont to do something'. Moreover, Ørnsnes (2007: Fn. 23) points out that there is also a small group of object control verbs that alternate between *zu*-infinitive complements and verbless directional phrases, such as *bitten*, *wünschen* and *schaffen*. Since an exact description of the relation between the small group of *zu*-infinitives and verbless directional phrases goes beyond the goals of the present investigation, it will be the task of some future enterprise to precisely examine the interdependence between the two classes of predicates.

When adopting a small clause or a predicate analysis, one more problem remains to be tackled. Verbs that embed a bare infinitive complement can be either classified as control verbs, or as raising verbs, depending on whether or not they carry a subject argument of their own. Assuming that directional phrases are predicates, this issue also needs to be addressed here. Since directional predicates do not usually combine with non-referential subjects, one major diagnostic for raising cannot be applied here (though it seemed to be possible in earlier stages of German, as will be shown in Section 2.2.6.3). It might be revealing to verify to what extent inanimate subjects are compatible with directional predicates. In the case of *können* with a possibility reading, this type of subject appears to be acceptable. It is not plausible to assume that the possibility is ascribed to the sun in example (78), resulting in some kind of ability reading. Rather, the possibility operator takes scope over the whole predication 'The heat of the sun (gets) in'.

In all examples of *können* with verbless directional phrases provided so far by Vater (2004), Hetland and Vater (2008), Szumlakowski-Morodo (2006), Ørnsnes (2007) and Erb (2001: 96), this verb denotes a possibility or a permission. Since the two corresponding counterparts of *können* with bare infinitive complements involve raising rather than control, it is fairly likely that this is also the case in the examples (77) to (79).

As illustrated in example (80), there are some rare instances of *können* with a verbless directional phrase in which an ability interpretation is most plausible. As shown in Section 2.2.1.2, this in turn requires the presence of a subject argument which is an indicator for control.

- (77) Waffnen zu Hause müssfen stärker kontrolliert werden, aber die
 arms at home must stronger controlled be but the
 Polizei kann nicht ohne Weiteres in die Wohnungen hinein.⁴⁸
 police can NEG without further into the apartment in

'More strict controls should be in place concerning the possession of fire arms in the house the police are not allowed to enter without further permission.'

- (78) Die Sonnenwärme kann hinein, aber nicht wieder heraus.⁴⁹
 the sun.heat can in but NEG again out
 'The heat from the sun can get in but it cannot get out.'
- (79) Es sollte gewährleistet sein, dass sie jederzeit in Haus oder
 it should warranted be that they always in house or
 Wohnung hinein können.⁵⁰
 apartment in can
 'It should be ensured that cats can get into the house or apartment anytime.'
- (80) Ich kann schon alleine auf's Katzenklo und erkunde
 I can already alone at.the cat.litter.pan and explore
 gerade die große weite Welt.⁵¹
 currently the great wide world.
 'As a kitten, I can already find the cat litter tray on my own and currently I am about to start exploring the big wide world.'

This section demonstrated that verbless directional phrases that occur with the six traditional modal verbs are not a result of ellipsis of a motion verb. Rather, they have to be considered as predicates or small clauses. As is clear from the examples above, these patterns can in principle involve raising as well as control. The reason why Barbiers (1995: 162) argues that directional phrases always induce raising is inherent to the Government & Binding theory and not mandatory for any other type of theory.

2.2.1.5 Raising infinitives with propositional modification

Epistemic modifiers are characterized by three important properties. First of all, they do not encode statements about the actual world, but rather express assumptions about possible worlds. Secondly, they do not indicate that the speaker has knowledge of factive realisations of the predication. A phrase like 'the lake could be cold' can even be uttered if the speaker does not know whether there was a single moment at which the lake was indeed cold. Finally, a proposition in the

⁴⁸ DeReKo: BRZ09/MAI.05378 Braunschweiger Zeitung, 12/05/2009.

⁴⁹ DeReKo: RHZ09/FEB.09586 Rhein-Zeitung, 11/02/2009.

⁵⁰ DeReKo: BRZ09/JAN.03341 Braunschweiger Zeitung, 09/01/2009; Was Hunde- und Katzenbesitzer zurzeit beachten sollten.

⁵¹ <http://www.neue-mitmach-zeitung.de/osthrunderfehn/lokales/katzenfindelkinder-in-osthrunderfehn-wer-hat-ein-herz-d931.html>, 28/01/2010.

scope of an epistemic modal operator can never be part of the speaker's knowledge. Similar observations have already been made by Westmoreland (1998: 12), Diewald (1999: 209, 225) Ziegeler (2006: 90), Fintel and Gillies (2010: 353), Kratzer (2011, 2012: 99) and Martin (2011). Note that there is a similar claim by Zimmermann (2004: 256) about the German discourse particle *wohl*.

This section deals with the epistemic interpretation of *können*. The main characteristic of epistemic modifiers is that they are evaluated with respect to the knowledge of the speaker (deictic centre). Adopting the position developed by Westmoreland (1998: 12) and Ziegeler (2006: 90), the use of an epistemic modifier presupposes that the speaker (deictic centre) does not know whether the epistemically modified proposition holds or not. For the sake of simplicity, this condition was labelled *Condition on Deictic Centres* (CoDeC) in Section 2.1.3.3. Accordingly, this section will only deal with instances of what Lyons (1977: 797) defines as 'subjective' epistemicity. As will be shown in Section 4.22, all of the examples for objective epistemicity discussed so far can be considered either as subtypes of circumstantial modality such as practical necessity or practical possibility, or as ('subjective') epistemic modality. Some authors, such as Palmer (1986: 53), have a broader definition of epistemic modality, which encompasses judgements (speculative, deductive) and evidentials (reportative, based on senses). The term epistemicity as it is used here only comprises Palmer's (1986) first subtype: Judgements.

According to the CoDeC, a speaker (deictic centre) who uses an epistemic modal verb signals that the epistemically modified proposition is not part of his knowledge. So whenever a speaker knows that the proposition under discussion is true, the modal verb employed cannot be an epistemic one. In this section, the extent to which propositions in the scope of an epistemic modal verb may be part of the speaker's knowledge will be tested.

Epistemic modal verbs can be characterised in terms of two types of environments: (i) environments in which they are possible while their non-epistemic counterparts are excluded, and (ii) environments in which they are excluded while their non-epistemic counterparts are possible. As will be illustrated in more detail in Chapter 3, circumstantial modal verbs with referential subjects fail to embed predications that include an identified individual and a predicate that refers to an event in the past or a predicate that denotes permanent states that cannot be changed. Epistemic modal verbs crucially differ in this respect. They are even highly frequent in such environments, as is illustrated in example (81) and (82). Similar observations have been made by Barbiers (1995: 148) and Barbiers (2002: 59). Likewise, Bech (1949: 43) already wonders why modal verbs with infinitive perfect complements target the "reality" of the embedded predication rather than its "realisation".

- (81) RUPRECHT: [...] Es kann ein dritter wohl gewesen sein.⁵²
 it can a third perhaps be-PPP INF
 RUPRECHT: ‘Perhaps, it could have been a third person.’
- (82) Nach Zeugenangaben könnte ein etwa 30 Jahre alter Mann
 after witness.reports can-SBJV.PST a about 30 year old man
 der Täter sein.⁵³
 the culprit be-INF
 ‘According to witness reports, the culprit could be a man who is about 30 years old.’

Crucially, in both examples above the proposition in the scope of the epistemic modal verb cannot be part of the speaker’s knowledge. Neither does Ruprecht know who has broken the jug at the moment of his utterance, nor does the author of the other sentence know that the about 30 year old man is the culprit. This is an essential contrast to practical possibility modal verbs and quantificational modal verbs that are in principle compatible with utterance situations in which the speaker can know that the embedded predication holds, as will be demonstrated in more detail in Chapter 3.

The second way to characterise epistemic modal verbs is in terms of the environments from which they are excluded, while their circumstantial counterparts are fully acceptable. In the past decades, more than twenty such contexts have been suggested. Based on large data samples exploited from the DeReKo corpus, it will be demonstrated in some detail in Chapter 4 that only a couple of them are empirically justified: Epistemic modal verbs in German do not occur with verbless directional phrase complements, they cannot be separated from their infinitive complements in *wh*-clefts, they do not undergo nominalisation, they are banned from adverbial infinitives, and finally, they cannot occur embedded under another modal operator. These results are similar to the conclusion that Eide (2005: 9) arrives at for Norwegian.

It deserves closer attention that epistemic *können* comes in two different guises: As *kann*, with indicative inflection, and as *könnte*, with subjunctive past inflection. As it turns out, the two alternatives are not interchangeable because they differ with respect to some semantic subtleties. The main question that arises at this point is what the semantic effect of subjunctive morphology on epistemic modal verbs is. As has been observed by Lötscher (1991: 347), epistemic modal verbs that occur in the scope of a subjunctive past marker behave in an unexpected way. Based on the assumption that the past subjunctive in German indicates the counterfactuality of the modified proposition in non-embedded environments,

⁵² Heinrich von Kleist *Der Zebrochene Krug*, 9. Entry (1806).

⁵³ DeReKo: RHZ08/JUN.01622 Rhein-Zeitung, 03/06/2008.

one would expect that an epistemic possibility in the scope of a subjunctive past operator would be interpreted as counterfactual epistemic possibility. However, this is clearly not the case in examples like (82): The speaker does not want to express that the epistemic possibility for the culprit to be the 30 year-old man is banned from the actual world. In more detail, Lötscher (1991: 347) argues that *kann* and *könnte* can be mutually replaced without causing any semantic effect. A similar observation has been made by Coates (1983: 239), who argues that the subjunctive mood in English, by and large, leaves epistemic modals unaffected.

In contrast, Fritz (1997: 101) observes that subjunctive morphology has an impact on the degree of certainty that is expressed by the epistemic modal verbs *können* and *müssen*. As he argues, the degree of certainty of these epistemic modal verbs decreases when a subjunctive of the past morpheme is attached.

After reviewing corpus examples for epistemic instances of *könnte*, it turns out that Lötscher's claim was wrong: The verb forms *kann* and *könnte* cannot always be replaced with each other without affecting the overall meaning of the sentence: First of all, a substitution of *könnte* with its indicative counterpart *can* yields a decreased degree of acceptability in most contexts, as the contrasts illustrated in (83)–(84) indicate:

- (83) a. Sollte diese Einschätzung zutreffen, dann könnte Iran
 should this assessment hold than can-SBJV.PST Iran
 bereits vor acht Wochen mit der Herstellung einer
 already before eight weeks with the production a-GEN
 Atombombe begonnen haben.⁵⁴
 nuclear.bomb begin-PPP have-INF

'If this assessment turns out to be correct, then Iran could have already started to produce a nuclear bomb eight weeks ago.'

- b. # Sollte diese Einschätzung zutreffen, dann kann Iran bereits
 should this assessment hold than can- Iran already
 vor acht Wochen mit der Herstellung einer Atombombe
 before eight weeks with the production a-GEN nuclear.bomb
 begonnen haben.
 begin-PPP have-INF

Intended: 'If this assessment turns out to be correct, then Iran could already have started to produce a nuclear bomb eight weeks ago.'

⁵⁴ DeReKo: A09/FEB.06422 St. Galler Tagblatt, 23/02/2009.

- (84) a. Das Mädchen hatte im Garten gespielt und plötzlich Blut
 the girl had in.the garden played an suddenly blood
 gespuckt. Die Angst der Mutter: Das Kleinkind
 spat the fear the-GEN mother the toddler
 könnte Glas verschluckt haben.⁵⁵
 can-SBJV.PST glass swallow-PPP have-INF
 ‘The girl was playing in the garden und suddenly she started spitting blood. The mother was afraid the toddler could have swallowed glass.’
- b. # Das Mädchen hatte im Garten gespielt und plötzlich Blut
 the girl had in.the garden played an suddenly blood
 gespuckt. Die Angst der Mutter: Das Kleinkind kann Glas
 spat the fear the-GEN mother the toddler can glass
 verschluckt haben.
 swallow-PPP have-INF
 Intended: ‘The girl was playing in the garden und suddenly she started spitting blood. The mother was afraid the toddler could have swallowed glass.’

Though the examples with *kann* in (84b) and (83b) are not completely ungrammatical, they represent a fairly unnatural choice. Obviously, *kann* requires a very specific context, which is not given here. It generally seems that epistemic *könnte* is much more flexible with respect to its distribution. In contrast, the use of epistemic *kann* turns out to be fairly restricted.

Nevertheless, there are environments in which epistemic *kann* cannot be substituted with its subjunctive past counterpart *könnte*. Most importantly, this concerns environments in which epistemic *kann* occurs in the scope of negation, as is illustrated in examples (85) and (86):

- (85) a. An mangelndem Training kann es am Montag nicht gelegen
 on lacking training can it on Monday NEG lie-PPP
 haben.⁵⁶
 have-INF
 ‘The lack of training cannot have been the cause on Monday.’
- b. # An mangelndem Training könnte es am Montag nicht gelegen
 on lacking training can it on Monday NEG lie-PPP
 haben.
 have-INF
 Intended ‘The lack of training cannot have been the cause on Monday.’

55 DeReKo: BRZ09/AUG.03524 Braunschweiger Zeitung, 08/08/2009.

56 DeReKo: HMP09/AUG.01455 Hamburger Morgenpost, 15/08/2009.

- (86) a. Die Tat kann ich nicht begangen haben, zum
 the crime can I NEG commit-PPP have-INF at.the
 beschriebenen Zeitpunkt saß ich schon einen Tag ein.⁵⁷
 given moment sat I already a day in
 'I cannot have committed the crime as I was already in jail at that given moment.'
- b. # Die Tat könnte ich nicht begangen haben, zum
 the crime can-SBJV.PST I NEG commit-PPP have-INF at.the
 beschriebenen Zeitpunkt saß ich schon einen Tag ein.
 given moment sat I already a day in
 Intended: 'I cannot have committed the crime as I was already in jail at that given
 moment.'

The only interpretation that is available in examples (85b) and (86b) is the one in which the negation is in the scope of the modal verb, yielding readings such as *It could be the case that the lack of the training was not the cause* and *It could be that I have not committed the crime*. But these readings are not plausible, in the given context.

As the data in the examples given above indicates, there is a subtle but solid difference between the epistemic interpretations of the indicative form *kann* and the subjunctive past form *könnte*. But how can this distinction be captured? At least two different types of epistemic *könnte* have to be considered. The example that involves a conditional (cf. 83a) seems to be revealing. In this particular instance, the speaker indicates that his evidence involves a premise that is not verified. In this conditional construction the non-verified premise is explicitly realised as the antecedent: *Sollte diese Einschätzung zutreffen* ('If this assessment is correct'). As the conditional in this example is an epistemic conditional (cf. Section 3.4.1), the consequent of this conditional expresses a proposition that is not part of the speaker's knowledge, an epistemically modified proposition. The role of the epistemic modal verb in this context appears to be redundant at first glance. But upon closer inspection, it turns out that it obviously specifies the degree of certainty of this assumption.

Given these observations, there are some reasons to assume that there is one type of epistemic *könnte* that refers to a conclusion that is based on evidence involving non-verified premises. According to Kasper (1987: 24–28), the subjunctive of the past indicates that the modified proposition cannot be felicitously asserted. In the canonical case, the proposition is interpreted as counterfactual. As has been shown by Lötscher (1991: 339), a subjunctive past operator that takes scope over a modal operator does not express the counterfactuality of the modal oper-

⁵⁷ DeReKo: RHZ09/NOV.18511 Rhein-Zeitung, 20/11/2009.

ator, as would be expected; rather it results in a factual interpretation. Maintaining Kasper's view, one could assume that a speaker who uses an epistemic modal verb in the scope of a subjunctive operator intends to communicate that he is not in a position to felicitously utter the epistemic modal verb in indicative mood. So a speaker who utters *könnte(p)* signals that for some reason he is not in a position to felicitously employ *kann(p)*. Accordingly, in most examples it is not the epistemic possibility that is counterfactual, as was already noted by Lötscher (1991: 347). It is plausible to assume, then, that the cause for the speaker's reservation has to do with the quality of the evidence on which the epistemic conclusion is based. In other words, the subjunctive morpheme on the epistemic modal verb indicates that the evidence contains premises that are not verified.

Furthermore, this account could provide an explanation for why epistemic *könnte* is hardly acceptable in the scope of a negation whereas epistemic *kann* is. Employing the indicative epistemic modal verb *kann*, the speaker indicates that his assumption is based on premises that are verified facts. When uttering $\neg\Diamond(p)$, he points out that this set of facts contains a premise *q* that contradicts *p*. Accordingly, the main reason to use such a pattern is to categorically refute the proposition *p*. The validity of a proposition can only be challenged, if the objections are based on established facts, rather than on non-verified premises. Because it is based on non-verified premises, *könnte* appears to be less suitable for such a purpose.

As example (83a) involves three different types of modifiers (subjunctive past operator, epistemic conditional operator, epistemic modal operator), the precise interaction of these elements still remains to be investigated in further detail. However, the analysis presented here would account for the observation made by Fritz (1997: 101) and Mortelmans (2000: 205), who notice that subjunctive morphology decreases the degree of certainty expressed by an epistemic modal verb. Moreover, it is supported by other recurrent instances of epistemic *könnte*, as in examples (87)–(89).

- (87) Dieses Mal geht es um fehlende Geldbeträge aus der
 this time goes it about missing money.amounts out the
 Klassenkassa. Schnell ergibt sich der Verdacht, dass Heinz
 class.cash.box quickly result REFL the suspicion that Heinz
 Schimmel, ein Mitschüler, der Täter sein könnte.⁵⁸
 Schimmel a classmate the culprit be-INF can-SBJV-PST
 'This time, it is about amounts of money that are missing in the cash box of the class.
 Quickly, the suspicion arose that Heinz Schimmel, a classmate, could be the culprit.'

⁵⁸ DeReKo: NON09/NOV.13407 Niederösterreichische Nachrichten, 23/11/2009.

- (88) Das Blut, das er dabei vergoß, könnte für die Gendarmerie
 the blood that he thereby spilled could for the police
 eine heiße Spur sein, denn nun besitzt sie einen genetischen
 a hot trace be-INF as now possesses she a genetic
 „Fingerabdruck“ des Einbrechers.⁵⁹
 fingerprint the-GEN burglar-GEN

‘The blood that he spilled in doing so could be a fruitful hint for the police, as they now have a genetic ‘fingerprint’ of the burglar.’

- (89) Laut Polizei könnte der Junge der bisher unbekannte
 according police can-SBJV.PST the boy the hitherto unknown
 Täter sein, der am Montag oder Dienstag in ein
 culprit be-INF that on Monday or Tuesday into a
 Wohnhaus im Küferweg eingebrochen war.⁶⁰
 residential.building at.the Küferweg in.break-PPP was

‘According to the police, the boy could be the hitherto unknown culprit that on Monday or Tuesday broke into the residential building at Küferweg.’

Once again, in all of these contexts epistemic *kann* is very unnatural. An interesting case is the example (89). As has been observed by Stephenson (2007: 490), some adverbials can be used to identify the deictic centre. Following this observation, the utterance in example (89) is ambiguous. In the first interpretation, the adverbial *laut Polizei* (‘according to the police’) serves as deictic centre. Correspondingly, the assumption expressed by the epistemic modal verb *könnte* is attributed to the referent contributed by the adverbial, which is the police. In the second interpretation, the epistemic conclusion is attributed to the speaker, who indicates that he is not in a position to felicitously use the epistemic modal verb *kann* in this environment. The most plausible reason is that his conclusion would be based on premises that are non-verified. In the example above, these premises could be referred to by the adverbial *laut der Polizei*, which would be interpreted as *if the police are right*.

In some cases, the speaker may even draw his conclusion based on premises that he considers as counterfactual or false, as is illustrated in example (90). A similar example of epistemic *könnte* is discussed by Mortelmans (2000: 208).

- (90) Da schreibt Frau Scherfenberg gleich zu Anfang: Darwin
 there writes Mrs Scherfenberg already at beginning Darwin
 habe „den Glauben an den allmächtigen Schöpfergott
 have-SBJV.PRS the faith in the almighty creator.deity

59 DeReKo: V99/JAN.03151 Vorarlberger Nachrichten, 21/01/1999.

60 DeReKo: RHZ07/JUL.04745 Rhein-Zeitung, 05/07/2007.

der Bibel zerschmettert". Wenn das so wäre bzw.
 the-GEN Bible shattered if this so be-SBJV.PST or
 gewesen wäre, dann könnte es doch wohl nicht
 be-PPP be-SBJV.PST then can-SBJV.PST it PAR maybe NEG
 sein, dass die christlichen Kirchen eben diesen Glauben an
 be-INF that the Christian church precisely this faith in
 Gott den Schöpfer nach wie vor – auch 150 Jahre nach
 God the Creator after as before also 150 years after
 Darwins Werk – jeden Sonntag öffentlich bekennen – und zwar
 Darwin-GEN work every Sunday openly avow and PAR
 die Katholiken, die Protestanten und die Orthodoxen in gleicher
 the Catholics, the Protestants and the Orthodox in same
 Weise, von den Muslimen u.a. ganz zu schweigen.⁶¹
 manner about the Muslims etc completely to be.silent-INF
 'Mrs. Scherfenberg already claims at the outset that Darwin has shattered the faith
 in the almighty Lord of Creation. If this were indeed the case, then it could not be
 the case that Christian churches still openly avow this belief on every Sunday en-
 compassing the Catholics, the Protestants and the Orthodoxes, not to mention the
 Muslims.'

This example is remarkable for another reason: The epistemic instance of *könnte* occurs in the scope of negation. As has been shown above, this behaviour is rather atypical of epistemic *könnte*, though very typical of epistemic *kann*. This leads to the conclusion that the example above involves an instance of *könnte* that is compositionally built from epistemic *kann* and the subjunctive past morpheme. In Section 4.4, further examples of this type will be provided. The compositional interpretation is further confirmed by the fact that it can be replaced with its indicative cognate, together with the copula *wäre* in the conditional clause, which is also inflected for past subjunctive. This indicates that the use of *könnte* in example (90) is different from the one in the examples (87)–(89) discussed above, where it refers to an epistemic conclusion which is based on non-verified premises.

At this point, it is necessary to distinguish between two particular uses of epistemic *könnte*: one which is based on evidence that contains non-verified premises, and a second one which is based on premises that are false. Whereas the latter type can be accounted for in terms of a compositional interaction between the epistemic operator and the subjunctive past operator, the precise status of the first type is less clear. One option is to assume that the subjunctive operator affects the validity of the premises on which the epistemic conclusion is based. Yet, it remains to be shown how these elements interact in more detail. Otherwise,

⁶¹ DeReKo: NUN09/FEB.01667 Nürnberger Nachrichten, 14/02/2009.

epistemic *könnte* would have to be analysed as a non-compositional epistemic modal operator. As pointed out by Fritz (1997: 102), this scenario is rather likely.

There are at least two methods that could reveal the true nature of this non-verified premise interpretation of *könnte*, and that could illustrate to what extent it can be compositionally captured. Firstly, there are two ways of how the subjunctive of the past can be morphologically realised (Zifonun (1997: 1736)): either in a synthetic or in a periphrastic manner. In the case of *können*, the synthetic variant is *könnte*, and the analytic variant involves the subjunctive past auxiliary *würden*, and the infinitive *können*. If the *non-verified premise* reading is a result of semantic composition, it is expected to also be available in the analytic alternative. As it turns out, such instances of the periphrastic variant that come into consideration for an epistemic interpretation occur fairly rarely in the DeReKO corpus.

- (91) Im Programm der Stadt ist schon längst die Sanierung
 in.the program the-GEN city is already long the renovation
 des Marktplatzes vorgesehen. Hier könnte man
 the-GEN marked.place-GEN planned here can-SBJV.PST one
 statt dem jetzigen Geröll, als flaches Denkmal eine
 instead the current boulders as flat memorial a
 Pflasterung mit farbigem Steinmosaik in Form der Karte
 paving with coloured stone.mosaic in shape the-GEN map
 Europas gestalten. Politisch würde wohl niemand
 Europe-GEN arrange politically SBJV.PST.AUX maybe nobody
 dagegen sein können.⁶²
 against be-INF can-INF

‘The renovation of the market place has been already long ago considered in the program of the city. Here one could see a flat paving made out of a coloured stone mosaic in the shape of Europe. In political respect, nobody could disagree.’

The fact that the only occurrence of this in the DeReKo corpus is in the scope of negation merits closer attention. Given that there is a negation, it could not be replaced with its synthetic counterpart *könnte*. This indicates that the example (91) meets all of the criteria that are typical of epistemic *kann*. Thus, the only interpretation that is applicable to this pattern is the *counterfactual premise* interpretation, which refers to a counterfactual epistemic possibility. The *non-verified premise* reading does not apply. In a similar manner, Mortelmans, Boye and Auwera (2009: 34) have illustrated that the analytic pattern cannot construe the *non-verified premise* for *können* in German. In contrast, they demonstrate that in

⁶² DeReKo: I97/SEP.37816 Tiroler Tageszeitung, 27/09/1997.

Dutch this type of interpretation is available. The analytic pattern *zou + kunnen* can yield a *non-verified premise* interpretation.

The second way to determine the precise status of the non-verified premise interpretation with respect to compositionality is another replacement test that involves semantically related expressions, such as epistemic adjectives *möglich* ‘possible’ and *notwendig* ‘necessary’. If the non-verified premise reading is a result of semantic composition, it is expected to also be available with epistemic adjectives that are selected by a copula with subjunctive past morphology, in patterns such as *es wäre möglich, dass* ‘it is-SBJV.PST possible that’ and *es wäre notwendig, dass* ‘it is-SBJV.PST necessary that’. But if the epistemic modal verb *könnte* in example (87) is substituted with an epistemic adjective, the meaning of the whole utterance will be affected, such as in example (92).

- (92) Schnell ergibt sich der Verdacht, dass es möglich wäre,
 quickly result REFL the suspicion that it possible be-SBJV-PST
 dass Heinz Schimmel, ein Mitschüler, der Täter ist.
 that Heinz Schimmel a classmate the culprit is
 ‘Quickly, the suspicion arose that Heinz Schimmel, a classmate, could be the culprit
 (under some circumstances).’

Once again, the interpretation in which the epistemic possibility is counterfactual is the preferred one. It is hard to decide whether the non-verified premise interpretation is possible at all in this type environment. The past subjunctive of the copula appears to indicate that the possibility is not actual, under the given circumstances. This results from the two replacement tests strongly suggests that the non-verified premise interpretation is not compositional, or at least it involves a very different mechanism.

Unlike epistemic modal verbs that are inflected for indicative, their subjunctive of the past counterparts can embed propositions that are known to be false.

- (93) Nach all dem was ich weiß, könnte das der Schlüssel
 according all that what I know can-SBJV.PST this the key
 zu Zhannas Büro sein. Er ist es aber nicht.
 to Zhanna-GEN office be-INF he is it but NEG
 ‘According to what I know, this could be the key to Zhanna’s office. But it isn’t.’

Examples like (93) describe a conflict between the evidence drawn from the knowledge, and the external evidence provided by the utterance situation. A similar observation has been made by Copley (2006: 5) for the English modal auxiliary *should*. If *könnte* is replaced with its indicative cognate *kann*, the acceptability significantly decreases. However, it still must be examined if this phenomenon applies to *könnte* to the same extent in its non-verified premise interpretation, and its counterfactual premise interpretation.

As already indicated at the outset of this section, the most efficient definitions of epistemic modality impose restrictions on the speaker's (deictic centre's) knowledge. The accounts reviewed so far differ with respect to the precise formulation of these restrictions. Some accounts assume that the usage of an epistemic modal operator presupposes that the speaker does not know whether the proposition is true or false. As a consequence, neither p nor $\neg p$ should be part of the speaker's knowledge. In contrast, Martin (2011:Sect. 3.1) argues that a speaker who uses an epistemic modal operator cannot know that the proposition is false, thus the proposition $\neg p$ must not be part of the speaker's knowledge. Both analyses cannot neatly account for the example given above (93) without any further stipulation. The analysis developed here is based on the assumption that the proposition in the scope of the epistemic modal operator must not be part of the speaker's knowledge (CoDeC). From this point of view, the example given above can be accounted for, as the knowledge of the speaker only comprises the proposition \neg (*this is the key to Zhannas office*) but not the proposition *this is the key to Zhannas office*.

As it seems, one major difference between epistemic *kann* and *könnte* concerns the way they qualify their underlying evidence. Whereas the former type indicates that the underlying evidence is entirely made up out of facts, the latter signals that some of the premises are not verified. Yet, there are some open questions. First of all, it is not clear why epistemic *kann* occurs so rarely. Unlike the other epistemic modal verbs in German, it occurs more often in the scope of negation and in questions, which are rather atypical environments. This has led some authors, such as Öhlschläger (1989: 208), to the conclusion that these instances of *kann* do not involve genuine epistemic modality, but rather 'objective' epistemic modality, which is considered as a less grammaticalised type. At this point, it is not evident whether *können* involves a true independent epistemic reading at all. As for its English counterpart *can*, it has been shown on various occasions that it lacks this type of reading, as illustrated by Hofmann (1976: 94), Coates (1983: 85), Sweetser (1990: 62), Brennan (1993: 14) and Drubig (2001: 43), for instance. Further details are discussed in Section 3.3.

It is a serious matter to decide how to distinguish between an epistemic possibility interpretation, a practical possibility interpretation and a quantificational reading, as their communicative effect can be the same. However, the possibility modal verb *kann* differs from its English counterpart *can* in two essential respects: It embeds predications that involve an identified individual, and a predicate that refers to a permanent state or that refers to the past, and in these environments the embedded proposition is not part of the speaker's knowledge, as the examples below indicate. Both properties are characteristic for genuine epistemic modal operators. Furthermore, it will be demonstrated in Chapter 4 that the assumption of

an ‘objective’ epistemic modality is misleading, thus refuting Öhlschläger’s objections.

There are a couple of environments in which it becomes far more likely that *können* is epistemically interpreted. As Doitchinov (2001: 119) argues, the pattern *es kann sein, daß* ‘it could be that’ forces an epistemic interpretation, as in examples (94)–(97). Furthermore, modal verbs are preferably epistemically interpreted whenever they select individual-level predicates, as illustrated in examples (98)–(99), or complements with past reference, as shown in examples (101)–(102). A detailed discussion of these diagnostics will be given in Chapter 3.

- (94) Es kann sein, dass die Zisterne so um 330 nach Christus hier
it can be that the cistern PAR about 330 after Christ here
angelegt worden ist.⁶³
built PAS.AUX-PPP is
‘It is possible that the cistern was built here about 330 years after Christ.’
- (95) Es kann sein, dass zwischen dem Teamchef und Ivanschitz
it can be that between the team.leader and Ivanschitz
etwas vorgefallen ist.⁶⁴
something happened is
‘It is possible that something happened between the team leader and Ivanschitz.’
- (96) Es kann sein, dass mich die neue Frisur ein wenig schneller und
it can be that me the new haircut a little faster and
besser gemacht hat [...]⁶⁵
better made has
‘It is possible that my new haircut enabled me to be faster and better ...’
- (97) Es kann sein, dass Ardi ein direkter Vorfahr ist.⁶⁶
it can be that Ardi a direct ancestor is
‘It is possible that Ardi is a direct ancestor.’
- (98) Vieles spricht dafür, dass der festgenommene Mann der Täter
much speaks in.favour that the arrested man the culprit
sein kann.⁶⁷
be can
‘There are many factors in favour of the assumption that the arrested man could be the culprit.’

⁶³ DeReKo: RHZ08/JUL.05907 Rhein-Zeitung, 04/07/2008.

⁶⁴ DeReKo: NON09/NOV.05778 Niederösterreichische Nachrichten, 10/11/2009.

⁶⁵ DeReKo: HAZ09/DEZ.03174 Hannoversche Allgemeine, 21/12/2009.

⁶⁶ DeReKo: NUZ09/OKT.00590 Nürnberger Zeitung, 08/10/2009.

⁶⁷ DeReKo: RHZ08/FEB.11333 Rhein-Zeitung, 13/02/2008.

- (99) Diese traditionelle Schilderung kann allerdings auch falsch sein.⁶⁸
 this traditional description can however also false be
 ‘However, this traditional description could also be false.’
- (100) So kann die Motte in Wipshausen einmal ausgesehen haben.⁶⁹
 so can the Motte in Wipshausen once out.look-INF have-INF
 ‘The Motte in Wipshausen may have looked like this once upon a time.’
- (101) Ich kenne den Täter nicht, er kann die Taten auch begangen
 I know the culprit NEG he can the acts also committed
 haben, um Macht und Kontrolle auszuüben.⁷⁰
 have in.order.to power and control exert-INF
 ‘I don’t know the culprit, but he may have also committed the acts in order to exert power and control.’
- (102) Es kann auch ein zusätzlicher Einsatz-Alarm das Signal
 it can also a additional mission.alarm the signal
 überlagert haben.⁷¹
 interfere-PPP have-INF
 ‘There could have been an an additional alarm that interfered with the signal.’

Note that in none of the examples could the speaker resume the discourse by stating ‘... and I know that is the case’. Doitchinov (2001) is not quite right in his claim that *es kann sein, daß* needs to be obligatorily interpreted in an epistemic way, since there are rare cases in which the speaker could in principle know whether the proposition holds or not:

- (103) Die Zahnradstrecke mit bis zu 90 Promille Gefälle verbindet
 the cog.railroad with up to 90 per.mill slope connects
 mitunter zwei völlig unterschiedliche Klimazonen: Es
 occasionally two completely different climes: it
 kann sein, dass in Heiden tiefster Winter ist, am See unten
 can be that in Heiden deepest winter is at.the lake down
 jedoch alles grün. Oder umgekehrt: In Rorschach herrscht
 however everything green Or vice.versa in Rorschach reigns
 neblige Kälte, in Heiden dagegen warmes, sonniges Wetter⁷²
 foggy cold in Heiden in.contrast warm sunny weather

⁶⁸ DeReKo: WPD/AAA.01884 Leipnizkeks, Wikipedia, 2005.

⁶⁹ DeReKo: BRZ09/AUG.04565 Braunschweiger Zeitung, 11/08/2009.

⁷⁰ DeReKo: HAZ09/FEB.00785 Hannoversche Allgemeine, 05/02/2009.

⁷¹ DeReKo: NON09/DEZ.05190 Niederösterreichische Nachrichten, 08/12/2009.

‘The train track with 90 per mill gradient occasionally connects two completely different weather climates. It can be that it is winter in Heiden and at the lake it is green. And vice versa: It is cold in Rorschach and sunny in Heiden.’

The pattern in example (103) turns out to be an instance of practical possibility or event quantification. The copula *sein* is interpreted as *vorkommen* ‘occur’, resulting in a quantification over events: ‘Sometimes it is the case that it is cold, sometimes not’. As a consequence, the speaker could add something like: ‘And by the way, now it is indeed very cold in Heiden’.

Summing up, in this section it has been pointed out that epistemic *können* comes in two major guises. First, there is epistemic *kann* bearing indicative morphology. It is fairly rare, and it indicates that the underlying evidence on which the epistemic conclusion is based entirely consists of premises that are facts. In contrast, epistemic *könnte* with a subjunctive of the past inflection is much more frequent. It is found with two interpretations: In its counterfactual premise-reading, it indicates that some of the underlying premises are counterfactual. Moreover, the epistemic possibility is counterfactual. Thus, in terms of compositionality, it behaves exactly as is expected of an epistemic operator in the scope of a subjunctive past operator. Apart from this, *könnte* can be frequently found with a non-verified premise-reading. In this interpretation, the epistemic conclusion is based on evidence that involves premises that are not verified.

This indicates that epistemic modal verbs differ with respect to how they qualify the underlying evidence, and it confirms the observation made by Copley (2006: 11), who illustrated that epistemic *should* is restricted to temporally remote evidence.

2.2.2 *müssen*

The semantic range of *müssen* encompasses the expression of a physical need, an obligation, a practical necessity and an epistemic necessity. Depending on its specific meaning, it is subcategorised for a control infinitive, for a raising infinitive or for a verbless directional phrase. Similarly to *können*, *müssen* also occurs as quantificational modal verb. Since this only affects those cases in which it is in the scope of negation, it has attracted no attention in research so far. In these uses, it will be interpreted as a universal quantifier in the scope of negation ($\neg\forall$) that quantifies over the type of individual encoded by the subject argument.

72 DeReKo: A08/JUL.06635 St. Galler Tagblatt, 28/07/2008.

2.2.2.1 Control infinitives with event modification

In German, *müssen* is used to express sensations that originate in physical needs related body functions whose initiation are typically beyond control, such as laughing, sneezing, urinating, defecating and vomiting. These uses have already been identified as independent interpretations by Becker (1836: 181) as physical necessity readings. Since the necessity originates within the subject referent in all of these cases, Erb (2001: 78) argues that in these instances, *müssen* involves a dynamic modality. Similarly to *können*, it has to be considered a control verb.

(104) Clara muss_{DYN} niesen.⁷³
 Clara must sneeze-INF
 ‘Clara needs to sneeze’

(105) Zwei Zuschauer müssen lachen.
 two spectators must laugh-INF
 ‘Two spectators have no other choice but to laugh / two spectators are bursting out laughing.’

This variant of *müssen* typically selects intransitive verbs which express a body function of their subject referents, and which therefore select animate subject arguments. As a consequence, the standard diagnostic for control, such as the voice transparency test, cannot be applied. Being restricted to a small class of predicates with experiencer subject arguments, there is no meaningful environment in which it could embed an infinitive that lacks a referential subject such as *regnen* ‘rain’ or impersonal passives. But this selectional restriction could also be an indication that in its physical need reading, *müssen* is not compatible with non-referential subjects. The only diagnostic for control that applies is the unavailability of *de dicto* readings with quantified NPs in subject positions: The quantifier *two* in example (105) always takes scope over the necessity operator. The canonical interpretation is one in which the two spectators are each affected by a different neuro-biological stimulus. An interpretation in which the quantifier is interpreted within the scope of the necessity operator would be possible in a scenario in which one neuro-biological stimulus may affect several bodies at the same time. Since in reality neuro-biological stimuli do not transgress the boundaries of a body, a *de dicto* reading is not plausible for any quantified subject NP that agrees with an instance of *müssen* that encodes a physical need.

To the extent that these observations hold, there is no reason to consider the physical need reading as a raising construction. Thus, this variant of *müssen* has to involve a control infinitive and selects a subject argument of its own that en-

⁷³ As cited in Erb (2001: 78).

codes the source of modality. This is supported by evidence from Dutch. As Barbiers (1995: 155) argues, the Dutch counterpart *moeten* even occurs as a transitive verb in these contexts:

- (106) Jan moet en plas.
 Jan must a wee
 ‘Jan must go for a wee.’

As was already indicated in the preceding section, it is far from clear whether there are other interpretations of *müssen* that could involve a control pattern. There is a debate concerning the extent to which deontic modal verbs are control verbs or not. Prominent positions are defended by Ross (1969: 86), Jackendoff (1972: 102), Öhlschläger (1989: 105), Palmer (1990: 47), Brennan (1993: 25), Barbiers (1995), Wurmbrand (2001) and Abraham (2001: 18, 2002: 36, 2005: 241, 257, 261). By means of the diagnostics invoked here, it is easier to prove that a verb is a raising verb than proving that it is a control verb. As will be shown, it is evident that there are deontic instances of *müssen* that are raising verbs, but it is not a trivial task to find compelling evidence for the existence of deontic modal verbs that are control verbs. This issue will be addressed in more detail in Section 2.2.2.3.

2.2.2.2 Control directionals with event modification

Likewise, the physical need reading can also be found with verbless directional phrases.

- (107) Ich muss aufs Klo.
 I must at.the toilet
 ‘I need to go to the toilet.’

Again, it is evident that the modal force originates from within the subject referent. Thus, it fulfils the criterion of dynamic modality and, as a consequence, the subject NP of *müssen* has to be its own argument in these cases rather than an argument that has been raised from an embedded predicate.

2.2.2.3 Raising infinitives with event modification

As has been demonstrated by Welke (1965: 71), Höhle (1978: 81), Öhlschläger (1989: 105), Palmer (1990: 47), Geilfuß (1992), Kiss (1995: 163), Axel (2001: 40), Reis (2001), Erb (2001: 73) and Wurmbrand (1999, 2001: 201), the German necessity modal verb *müssen* behaves like a logical one-place operator or a raising verb in its circumstantial interpretation. There are at least three different meanings for circumstantial *müssen* with a raising pattern that need to be distinguished: The de-

ontic obligation reading, the practical necessity reading and the quantificational reading, which will be discussed at the end of this section. These interpretations differ with respect to the modal source involved. While in the deontic obligation interpretation, the modal source is identified with a human referent, it refers to circumstances or forces of nature in the practical necessity reading. How the modal source is instantiated in quantificational uses is less clear.

As was illustrated in Section 2.2.1.3, raising verbs are characterised by three properties. First, lacking a subject argument, they can occur with a non-referential subject. Accordingly, in its practical necessity and in its obligation reading, *müssen* selects predicates that are subcategorised for non-referential subjects such as weather verbs and patterns that do not involve a subject at all:

(108) Es muss_{DEO} (hier unbedingt noch) schneien.
 it must here absolutely still snow-INF
 'It is absolutely necessary that it snows here.'

(109) ... dass (unbedingt noch) getanzt werden muss_{DEO}.
 that absolutely still dance-PPP PAS.AUX-INF must.
 'It is absolutely necessary that someone dance here.'

Note that *müssen* only exhibits a practical necessity interpretation in example (108). This is for pragmatic reasons, as it is rather unlikely to impose obligations on the weather, or to oblige someone to change the weather. In contrast, the example with impersonal passive (109), which does not involve any subject at all, can be interpreted as obligation without any problems. Deontic patterns of *müssen*, which do not carry a referential subject, can be easily found in corpora, as is indicated in examples (110)–(112):

(110) „Für jede einzelne Tat muss es eine Freiheitsstrafe geben“, sagt
 for each single crime must it a imprisonment give-INF says
 die Staatsanwältin in ihrem Plädoyer.⁷⁴
 the attorney in her plea
 ‘„For each single of these crimes, the accused must be sentenced with an imprisonment.“ the attorney says in her plea.’

(111) In Kanada muss künftig länger gearbeitet werden.⁷⁵
 in Canada must henceforth longer work-PPP PASS.AUX-INF
 'In Canada, people will have to work longer in future.'

74 DeReKo: BRZ06/DEZ.00079 Braunschweiger Zeitung, 01/12/2006.

75 DeReKo: A12/MAR.14387 St. Galler Tagblatt, 31/03/2012.

- (112) Bleibt die Miete oder auch die Kautions aus, ist für den Vermieter stays the rent or also the deposit out is for the landlord umgehendes Handeln geboten. Jede unnötige Verzögerung immediate reaction required every unnecessary procrastination vertieft den möglichen Schaden. Mit Kündigung und increases the possible damage with cancellation and Klage muss nicht mehrere Monate gewartet werden.⁷⁶ complaint must NEG more months wait-PPP PASS.AUX-INF

'If the rent or the deposit is not paid, it is necessary for the landlord to react immediately. Every unnecessary procrastination can increase the damage. It is no longer obligatory to wait patiently a couple of months before considering cancelling the contract or even filing a complaint.'

Secondly, as has been pointed out by Stechow (2003: 203), Wurmbrand (1999: 606 2001: 192), raising verbs tolerate *de dicto* interpretations of quantified NPs. In the corpus examples (113) and (114) the indefinite NPs is interpreted in the scope of the modal necessity operator yielding a reading in which the NP does not refer to a particular individual. Whereas example (113) involves a practical necessity interpretation, a deontic interpretation turns out to be more plausible for example (114).

- (113) Die Arbeit zu zweit ist auch deswegen unerlässlich, weil einer the work in two is also therefore indispensable because one von uns beiden immer wach sein muss, um die Piloten of us two always awake be-INF must in.order.to the pilots des Ballons zu leiten.⁷⁷ the-GEN balloon to direct-INF

'The work in pairs is also necessary for the particular reason that one of the two of us has to stay awake to pilot the aviators of the balloon.'

- (114) Wollen Jugendliche im Kubus eine Runde »töggelen«, erhalten want adolescent in.the cubus a round play receive sie einen Spielball. Bedingung: Einer muss das Handy als they a ball condition a must the cell.phone as Depot hinterlegen.⁷⁸ deposit deposit-INF

'If teenagers want to play a round in the cubus, they will get a ball. There is a condition: one of them has to leave his mobile phone as a deposit.'

⁷⁶ DeReKo: BRZ06/APR.00020 Braunschweiger Zeitung, 01/04/2006.

⁷⁷ DeReKo: E99/MAR.06800 Zürcher Tagesanzeiger, 13/03/1999.

⁷⁸ DeReKo: A10/JUN.03327 St. Galler Tagblatt, 10/06/2010.

Likewise, example (115) clearly exhibits a deontic interpretation in a context in which a sergeant issues an order to his group of soldiers. In this particular context, he does not oblige a particular individual to guard the object. The quantifying expression *ein* needs to bear the accent in the NP in this type of configuration. Note that it is not relevant here whether *ein* and *einer* are used as an indefinite pronoun or as a numerical determiner in the examples given below, as Carpenter (1998: 87) has illustrated that numerical determiners behave like ordinary existential quantifiers.

- (115) Ein Mann muss die gesamte Nacht das Objekt bewachen.
 a man must the whole night the object guard-INF
 ‘During the whole night, one person has to guard the object.’

Thirdly, raising predicates are transparent with respect to voice. The sentences (116a) and (116b) involve infinitival complements that refer to the same state of affairs. They only differ with respect to how they encode their subjects: In the active example (116a), the subject is the underlying agent argument *der Reinhold*, in the passivised example the subject is identified with the underlying theme argument *der Nanga Parbat*. If *müssen* selected a proper subject argument, we would expect the obligation to be imposed on Reinhold in (116a), and on the Nanga Parbat in the passivised example (116b), yielding an unacceptable interpretation. But as it turns out, the two sentences do not differ with respect to their meaning.

- (116) a. Der Reinhold muß den Nanga Parbat ohne
 the Reinhold must the-ACC Nanga Parbat without
 Sauerstoffgerät bezwingen.
 oxygen.apparatus conquer-INF
 ‘Reinhold has to conquer the Nanga Parbat without oxygen mask.’
- b. Der Nanga Parbat muß vom Reinhold ohne
 the-NOM Nanga Parbat must by.the Reinhold without
 Sauerstoffgerät bezwungen werden.
 oxygen.apparatus conquer-PPP PASS.AUX-INF
 ‘The Nanga Parbat has to be conquered by Reinhold without oxygen mask.’

Both examples can be interpreted with either an obligation reading or a practical necessity interpretation. Essentially, *müssen* does not assign a semantic role to the subject NP. This becomes most obvious in the example that involves the passivised infinitive complement (116b). Being a mountain, the Nanga Parbat is not an appropriate target for bearing an obligation. Thus, *müssen* cannot identify its subject as the goal of the obligation in these examples. Corresponding configurations can easily be found in corpora, as is illustrated in (117):

- (117) Der Dokortitel muss aberkannt werden.⁷⁹
 the doctor.title must deprive-PPP PASS.AUX-INF
 ‘The doctorate degree must be taken away.’

The example given above is a call based on laws and regulation. The only interpretation that is plausible here is a deontic one. Once again, *müssen* agrees with a subject that cannot be considered as its semantic argument. A doctorate degree is not a licit bearer of an obligation. Accordingly, the configuration illustrated above has to involve a raising pattern.

As was pointed out in the previous section, Carlson (1977: 119) and Brennan (1993: 96) identify certain uses of the possibility modal *can* as a quantificational modal verb. In addition, Brennan briefly discusses some quantificational uses of the necessity modal verb *will*. However, it remains mysterious why the less marked necessity modal verb *must* cannot act as a quantifier over indefinite NPs.

Unlike the English necessity modal verb *must*, its German counterpart *müssen* may occur in the scope of negation. In this type of configuration, it can occasionally exhibit an interpretation in which it acts as a quantifier over individuals. In example (118), *nicht müssen* serves as a negated universal quantifier over individuals ($\neg\forall$). It expresses that, in the set of good second-hand cars, there is at least one instance that is not worse than a new car. The remaining examples (119)–(123) behave in an according way.

- (118) Ein guter Gebrauchtwagen muss nicht schlechter sein als ein
 a good second-hand.car must NEG worse be-INF than a
 Neuwagen⁸⁰
 new.car
 ‘A good second-hand car does not need to be worse than a new car.’
- (119) Vegetarisches Essen muss nicht langweilig sein.⁸¹
 vegetarian food must NEG boring be-INF
 ‘Vegetarian food does not need to be boring.’
- (120) Kunst muss nicht immer brotlos sein.⁸²
 art need NEG always bread.less be-INF
 ‘Art does not need to be unprofitable.’

⁷⁹ Der Spiegel 8/2011, p. 27, 21.02.2011.

⁸⁰ DeReKo: NUZ11/MAI.01632 Nürnberger Zeitung, 18/05/2011.

⁸¹ DeReKo: BRZ11/JUN.06063 Braunschweiger Zeitung, 16/06/2011.

⁸² DeReKo: RHZ11/MAI.18218 Rhein-Zeitung, 16/05/2011.

- (121) Ein Hund, der mit dem Schwanz wedelt, muss nicht unbedingt
 a dog that with the tail wags must NEG necessarily
 freundlich gestimmt sein⁸³
 cordially tempered be-INF
 ‘A dog that wags its tail is not necessarily friendly.’
- (122) Ein Haus ohne Salonbetrieb muss nicht seelenlos sein.⁸⁴
 a house without salon.service must NEG soul.less be-INF
 ‘A house without service in the salon does not need to be soulless.’
- (123) Der 4. Juli muss nicht immer ein deutscher Freudentag sein. Auf
 the 4 July must NEG always a German joy.day be-INF at
 den Tag genau 44 Jahre nach dem ersten
 the day exactly 44 years after the first
 WM-Titelgewinn im Berner Wankdorfstadion (3:2
 world.championship.title in.the Bernese Wankdorf.stadium (3:2
 über Ungarn) hat Deutschland am Samstag in Lyon eine
 against Hungary) has Germany at.the Saturday in Lyon a
 der schmerzhaftesten Niederlagen hinnehmen müssen: im
 the-GEN painful-SUP defeat take- must in.the
 Viertelfinal an WM-Neuling Kroatien
 quarterfinal at world.championship.new.comer Croatia
 gescheitert, mit 0:3 verloren – klar und deutlich, ohne
 failed with 0:3 lost clearly and explicitly without
 Wenn und Aber.⁸⁵
 if and but.
 ‘The 4th of July does not need to be always a German day of rejoicing. Exactly 44 years after the first victory in the world championship final at the Berner Wankdorfstadion, Germany had to accept a very painful defeat on Saturday in Lyon: In the quarterfinal of the World Championship, they clearly lost against the newcomer Croatia with a final score of 0:3’

As for the examples (118)–(122), a deontic interpretation does not come into consideration. It makes no sense to impose an obligation that a new car has to be better than a second-hand car, or that vegetarian food has to be boring. However, there are a lot of ambiguous examples, e.g. (123), which can be interpreted as the negation of a call, yielding a deontic interpretation. Similar instances are discussed by Welke (1965: 72) labelled as ‘variante 2’.

⁸³ DeReKo: A09/NOV.00330 St. Galler Tagblatt, 02/11/2009.

⁸⁴ DeReKo: A98/OKT.63556 St. Galler Tagblatt, 09/10/1998.

⁸⁵ DeReKo: A98/JUL.45470 St. Galler Tagblatt, 06/07/1998.

It is worth mentioning that a subject NP in the scope of a negated universal quantifier is not always realised as an indefinite NP. In quite a lot of cases, such NPs are represented by mass nouns, e.g. *vegetarisches Essen* ‘vegetarian food’ in example (119), and *Kunst* ‘art’ in (120). It remains to be shown how this quantification over the extension of a mass noun can be properly formalised.

Finally, the question arises why these types of quantificational uses predominantly occur with the possibility modal verb *können* and the negated necessity modal verb *müssen*. This might be related to the position they occupy in the Aristotelian Square of Oppositions. Both the I and O corner host particularly valid propositions: The possibility modal verb *können* expresses a particular affirmative proposition, assigning a predication to some but not all items in its restrictor; the universal modal verb *müssen* expresses a particular negative proposition, assigning a predication to not all items in its restrictor. Thus, it seems that modal verbs in configurations that are related to a particular validity are more suitable to act as quantificational modals in German. Alternatively, the $\neg\Box p$ could be interpreted as $\Diamond\neg p$. Viewed from this point of view, the configuration could be seen as one which contains a possibility operator. Whether this phenomenon can be extended to other languages as well remains to be explored by future research.

2.2.2.4 Raising directionals with event modification

Like *können*, the necessity modal verb *müssen* occurs fairly often along with verbless directional phrases. Once again, there are revealing instances of these configurations in which no infinitive can be inserted without leaving the interpretation of this utterance unaffected, as the discussion in the previous section has revealed.

- (124) Jeans, Hemden, Jacken, Mäntel, Pullis, Anzüge, usw. –
 jeans shirts jackets coats sweater suits etc
 alles muss raus (#kommen/ #gebracht werden)!⁸⁶
 everything must out get carried PASS.AUX-INF
 ‘Jeans, shirts, jackets, sweaters, suits, etc – everything must go!’

As has been already shown in Section 2.2.1.4, there are a lot of reasons to consider these usages of modal verbs with verbless directional phrases as independent patterns that cannot be accounted for in terms of an ellipsis of an infinitive.

⁸⁶ DeReKo: A11/FEB.01302 St. Galler Tagblatt, 04/02/2011.

2.2.2.5 Raising infinitives with clause modification

As was already seen in the case of *können*, the epistemic uses of the necessity modal verb *müssen* are subject to the CoDeC: The proposition they embed cannot be part of the knowledge of the speaker (deictic centre). Moreover, they occur in environments in which circumstantial modal verbs are ruled out. They can modify predications that involve an identified individual and any predicate that refers to an event in the past (cf. 125 or 127), or a temporally unbound state (cf. 129 or 130). All of the epistemically modified utterances below imply that the proposition is not part of the speaker's knowledge.

- (125) Schreckliche Angst muss der kleine Junge gehabt haben, der
terrible fear must the small boy have-PPP INF that
am Samstag in ein tiefes Loch gefallen ist.⁸⁷
at Saturday in a deep hole fall-PPP is
'The boy who fell into the deep hole on Saturday must have been terribly frightened.'
- (126) Ereignet haben müssen sich die Taten zwischen
happen-PPP have-INF must REFL the crimes between
Donnerstag, 15 Uhr, und Dienstag, 6.30 Uhr.⁸⁸
thursday 15 o'clock and tuesday 6.30 o'clock
'The crimes must have happened between Thursday 3 p.m. and Tuesday 6.30 a.m.'
- (127) Die Kleidungsstücke deuten dann auch darauf hin, dass es sich
the clothes indicate then also to.it at that it REFL
um einen Mann gehandelt haben müsste.⁸⁹
about a man deal-PPP have-INF must-SBJV.PST
'The clothes indicate that it must have been a man.'
- (128) Während sie in Mutters Tagebüchern gestöbert hatte, traf sie auf
during she in mothers diaries rummage had met she on
drei Männernamen: Sam, Bill und Harry. Sie lädt diese zu
three male.names Sam Bill and Harry she invites them to
ihrer Hochzeit ein. Einer von ihnen muss ihr Vater sein, der sie
her wedding in one of them must her father be-INF that she
zum Traualtar führen sollte.⁹⁰
to.the altar guide-INF should
'While she was flipping through her mother's diaries, she could find three male names: Sam, Bill and Harry. She invites them to her wedding. One of them must be her father who should guide her to the altar.'

⁸⁷ DeReKo: BRZ09/JUL.16635 Braunschweiger Zeitung, 06/07/2009.

⁸⁸ DeReKo: BRZ09/APR.06547 Braunschweiger Zeitung, 16/04/2009.

⁸⁹ DeReKo: RHZ09/JUN.24827 Rhein-Zeitung, 29/06/2009.

⁹⁰ DeReKo: A09/JUL.00991 St. Galler Tagblatt, 03/07/2009.

- (129) Er muss der Täter sein, denn sein Sperma lässt sich in ihrem
 he must the culprit be-INF as his sperm lets REFL in her
 Unterleib nachweisen.⁹¹
 abdomen prove-INF
 'He must be the culprit because his sperm could be found in her pelvic area.'
- (130) Die Menschen schauen inzwischen William und Harry an und
 the people watch meanwhile William and Harry on and
 erkennen, dass Charles ein guter Vater sein muss⁹²
 recognise that Charles a good father be-INF must
 'Meanwhile, the people take a look at William and Harry and recognise that Charles
 must be a good father.'

Once again, the epistemic modal verb comes in two morphological realisations: As indicative *muss*, and as subjunctive of the past *müsste*. In contrast to the case of *können*, the use of indicative epistemic *muss* is significantly more frequent than its subjunctive counterpart. Even if the subjunctive is rare, it does exist, contradicting Lötscher (1991: 348), who claims that *müsste* can never be used as an epistemic modal verb.

As in the case of epistemic *könnte*, the interplay of the subjunctive and the epistemic modal operator is rather complex and it is no trivial matter to unravel them. In some semantic respects *müssen* behaves analogously to its possibility denoting counterpart *können*. In a number of contexts, they are not interchangeable without affecting the interpretation. First of all, the indicative epistemic necessity modal verb *muss* occasionally occurs in the scope of negation. Like the epistemic possibility modal verb *kann*, these instances cannot be replaced with their subjunctive past counterpart *müsste*.

- (131) a. Der Sachverständige aus Koblenz machte der Sache ein
 the accident.assessor from Koblenz made the affair a
 Ende. Unter Berücksichtigung von Fahrverhalten und
 end under consideration of driving.behaviour and
 Bewegungsablauf, Schadensbild, Bodenbelag,
 path.of.motion damage road.surface
 Lichtverhältnissen sowie Geräuschkulisse kam er zu
 lighting.conditions as.well.as background.noise came he to

⁹¹ DeReKo: NUZ09/JUN.00298 Nürnberger Zeitung, 04/06/2009.

⁹² DeReKo: SOZ08/NOV.02694 Die Südostschweiz, 14/11/2008.

dem Schluss, dass die Fahrerin den Unfall nicht
 the conclusion that the driver the accident NEG
 bemerkt haben muss.⁹³
 notice-PPP have-INF must

'The accident assessor from Koblenz put an end to this affair. Considering the driving behaviour, the path of motion, the damage, the road surface, the lighting conditions and the background noise, he came to the conclusion that the driver does not need to have noticed the accident.'

- b. # [...] kam er zu dem Schluss, dass die Fahrerin den
 came he to the conclusion that the driver the
 Unfall nicht bemerkt haben müsste.
 accident NEG notice-PPP have-INF must-SBJV.PST

Intended reading: '[...] he came to the conclusion that the driver does not need to have noticed the accident.'

- (132) a. Auch die Immobilienkrise in den USA muss noch nicht
 also the real.estate.crisis in the USA must still NEG
 ausgestanden sein.⁹⁴
 stand-PPP be-INF

'It is not necessarily the case that the real estate crises in the US has already been overcome.'

- b. # Auch die Immobilienkrise in den USA müsste noch
 also the real.estate.crisis in the USA must-SBJV.PST still
 nicht ausgestanden sein.
 NEG stand-PPP be-INF

Intended reading: 'It is not necessarily the case that the real estate crises in the US has already been overcome.'

In both examples that involve *müsste* (131b) and (132b), the epistemic necessity operator cannot be construed in the scope of the negation. This indicates that *müssen* with past subjunctive morphology is less acceptable in the scope of negation, if it is acceptable at all in such environments.

Apart from that, epistemic subjunctive of the past *müsste* resembles the epistemic possibility modal verb *könnte* with subjunctive morphology in another crucial respect: It qualifies the underlying evidence in a similar way. Again, there seem to be different ways in which the subjunctive past morphology affects the meaning of epistemic *müssen*. First of all, there are cases in which *müsste* indicates that the evidence on which the epistemic conclusion is based involves non-verified premises:

⁹³ DeReKo: RHZ06/FEB.12183 Rhein-Zeitung, 13/02/2006.

⁹⁴ DeReKo: RHZ07/OKT.17666 Rhein-Zeitung, 19/10/2007.

- (133) Die Schuldfrage ist noch nicht gänzlich klar, doch nach ersten Ermittlungen der Bundespolizei scheint das Rotlicht an der Bahnstrecke funktioniert zu haben. Demnach müsste der Lastwagen-Fahrer bei Rot über die Gleise gefahren sein.⁹⁵
 lorry.driver at red over the track drive-PPP be-INF
 ‘The issue of who is responsible is not entirely settled yet. According to the investigation carried out by the federal police, the traffic light seems to have worked. In correspondence, the driver of the lorry must have crossed the track when the light was red.’
- (134) Peter Westphal: „Wir haben die Oktobermieten gleich an Peter Westphal we have the October.rent immediately to Curanis/Vivacon überwiesen.“ Demnach müsste Vivacon Curanis/Vivacon transfered accordingly must-SBJV.PST Vivacon die Mieten erhalten haben.⁹⁶
 the rents receive-PPP have-INF
 ‘Peter Westphal: “We have immediately transfered the rent for October to Curanis/Vivacon” Correspondingly, Vivacon should have received the rent payments.’
- (135) Verursacher war wahrscheinlich ein Klein-Lkw oder Lkw, der bei causer was probably a small-lorry or lorry that at den Anhängerparkplätzen wendete und hierbei das Auto streifte.
 the trailer.parking turned and thereby the car scratch
 Es müsste sich um ein auffälliges
 it must-SBJV.PST REFL about a noticeable
 Wendemanöver gehandelt haben, da auf der
 transposition.manoeuvre deal-PPP have-INF as at the
 Teerdecke entsprechender Reifenabrieb zu erkennen war.⁹⁷
 road.surface corresponding tire.abrasion to recognise was
 ‘It was probably caused by a small lorry or a lorry that hit the car while turning at the trailer parking. It was obviously a noticeable transposition manoeuvre as the road surface exhibited corresponding traces of tire abrasion.’
- (136) Einer der Täter müsste sich die Kleidung während a the-GEN culprit must-SBJV.PST REFL the clothes during des Überfalls mit Blut beschmiert haben.⁹⁸
 the robbery with blood stain-PPP have-INF

⁹⁵ DeReKo: BRZ09/JUL.27453 Braunschweiger Zeitung, 31/07/2009.

⁹⁶ DeReKo: BRZ08/JAN.13019 Braunschweiger Zeitung, 29/01/2008.

⁹⁷ DeReKo: RHZ09/NOV.01570 Rhein-Zeitung, 03/11/2009.

‘One of the culprits hypothetically has to have gotten blood all over his clothes during the robbery.’

A lot of the instances found in the corpus reveal the precise nature of the interplay between the epistemic modal verb and the subjunctive operator. Frequently, they explicitly refer to a premise that cannot be taken for granted. In example (133), the adverb *demnach* is linked to the first shaky results of the investigation carried out by the police indicating that the traffic light was properly functioning. In a similar fashion, the adverb *demnach* refers to the statement made by Peter Westphal in example (134). Though not explicitly, *müsste* in example (135) refers to the prior assumption that a lorry probably caused the damage while it was turning. Apart from that, there are also examples of epistemic *müsste* that do not involve reference to a premise that has been made explicit in the prior discourse, such as example (136). As it seems, the prior discourse includes a non-verified presupposition that describes the circumstances of the robbery, such as that one of the culprits was so close to the victim that a contact with blood was inevitable.

In such configurations, the speaker signals critical distance with respect to the validity of these premises. But crucially, these premises in the examples above are not counterfactual or known to be false. The speaker is just not entirely convinced. In contrast to *könnte*, *müsste* can be replaced with its indicative cognate *muss* more easily in these instances. There appear to be subtle changes in the interpretation, as will be shown below in more detail.

Secondly, there are interpretations of epistemic *müsste* that are based on counterfactual premises. Analogous examples have been provided by Mortelmans (2000: 206).

- (137) Guido Niedermann fand am Waldboden eine Feder. »Ganz
 Guido Niedermann found at forest.ground a feather very
 deutlich ist zu sehen, dass diese Feder abgebissen wurde,
 clearly is to see that this feather off.bite-PPP was
 folglich war dieses Federvieh Opfer eines Marders oder
 thus was that poultry victim a-GEN marten-GEN or
 Fuchses. Wäre die Feder ausgerupft worden,
 fox-GEN. be-SBJV.PST the feather pinch-PPP PASS.AUX.PPP
 müsste der Täter ein Greifvogel gewesen sein«, erklärte
 must-SBJV.PST the culprit a raptor be-PPP be-INF said
 Niedermann.⁹⁹
 Niedermann

98 DeReKo: RHZ06/NOV.27737 Rhein-Zeitung, 28/11/2006.

‘Guido Niedermann found a feather in the forest. “It can be seen very clearly that this feather was bitten off. Thus, this poultry was a victim of a marten or a fox. If the feather were plucked, it would follow that the culprit must have been a bird of prey.” said Niedermann.’

- (138) Wenn alle Meldungen über Schwangerschaften der
 if all reports about pregnancies the-GEN
 Oscar-Preisträgerin gestimmt hätten, müsste sie
 oscar-winner attune-PPP have-SBJV.PST must-SBJV.PST she
 mittlerweile 30 Babys bekommen haben. Kidman ist Mutter
 meanwhile 30 babies get-PPP have-INF. Kidman is mother
 zweier adoptierter Kinder.¹⁰⁰
 two-GEN adopted-GEN children

‘If all of those reports about the Oscar winner’s pregnancies had been true, then she would have had 30 babies by now. Kidman is the mother of two adopted children.’

In both cases, it is evident that the premise expressed by the antecedent of the conditional is counterfactual: In example (137), the speaker makes it explicit that the feather was not plucked. Likewise, the person who utters the sentence in (138) refutes the claim that all reports that Kidman was pregnant were true.

If *müsste* is replaced with *muss* in the environments in which the epistemic conclusion is based on a counterfactual premise, an important difference becomes apparent with respect to the non-verified premise readings. Although *müsste* can be replaced with *muss* in non-verified premise readings, such replacement yields a diminished degree of acceptability in the counterfactual premise readings. The subjunctive morpheme of *müsste* is necessary to identify the premise as a counterfactual one. This clearly indicates that the interaction of the subjunctive operator and the epistemic operator can be construed in terms of semantic composition in counterfactual premise interpretations.

This further illustrates that there are good reasons to distinguish between the non-verified and the counterfactual premise interpretation of *müsste*. While the latter is an evident result of a compositional interplay of the counterfactual operator and the epistemic operator, the status of the first type is less clear.

As was shown in the preceding section, there are two ways of expressing the subjunctive of the past in German: with the synthetic form (*müsste*), and with an analytic form consisting of the subjunctive past auxiliary *würde* and a bare infinitive (*müssen*). If the counterfactual premise interpretation is indeed the result of semantic composition, it is expected that it should also be available if the subjunctive operator *würde* and epistemic modal operator (*müssen*) are combined in

⁹⁹ DeReKo: A00/FEB.13497 St. Galler Tagblatt, 22/02/2000.

¹⁰⁰ DeReKo: BRZ07/DEZ.11819 Braunschweiger Zeitung, 31/12/2007.

a periphrastic manner, and indeed such instances of the counterfactual premise interpretation can be found:

- (139) Der Autor: „Die Zukunft gehört der Tätigkeitsgesellschaft, in the author the future belongs the occupation.society in der Erwerb und Nichterwerb, Arbeit und Leben eine Einheit which earning and non-earning, work and life a union bilden und das Zeitdenken Vorrang vor dem constitute and the time.thinking priority before the Gelddenken hat.“ Demnach würde uns freie Zeit in money.thinking has accordingly SBJV.PST.AUX us free time in Zukunft wichtiger sein müssen als Gut und Geld. future important-COMP be-INF must-INF than goods and money Seit 1990 registrieren Statistiker aber einen gegenläufigen since 1990 register statistician yet a contrary Trend.¹⁰¹
trend

‘The author claims: “The future will be dedicated to the occupation society in which earning and non-earning, work and life constitute a union and time based reasoning prevails money based reasoning.” Accordingly, it would be the case that spare time must be more important to us in future than money and goods. However, since 1990 statisticians have been observing the opposite trend.’

In example (139), the speaker refers to an author’s hypothesis about the future of our society that he considers to be false. It appears to be much more difficult, if it is possible at all, to find an appropriate context in which a periphrastic form of the subjunctive of the past of *müsste* can be construed with a non-verified premise interpretation.

Though not obvious, a compositional analysis of the non-verified premise interpretation does not seem to be entirely excluded. Yet, it remains to be shown how these readings could be derived in a compositional way.

At this point the question arises of what the precise nature of these counterfactual operators is with respect to the status of the epistemic conclusion. It seems to be clear that the counterfactual premise interpretations occur predominantly in counterfactual (irrealis) conditionals. Accordingly, one could conclude that those cases in which epistemic *müsste* is not modified by a *wenn*-clause should be considered as truncated counterfactual (irrealis) conditionals.

According to Kasper (1987: 24–28), the semantic contribution of the subjunctive past operator is that the modified proposition cannot be felicitously uttered.

¹⁰¹ DeReKo: NUN98/MAI.01774 Nürnberger Nachrichten, 23/05/1998.

When this concept is applied to epistemic modal verbs, this would indicate that the epistemic conclusion is not drawn in the actual world, as one of the premises on which it is grounded is known to be false. More precisely, the speaker would signal that he is not in a position to draw this conclusion in the actual world, and that he would be able to do so in a minimally different possible world. Rephrasing the epistemic necessity modal operator in possible world semantics, this would yield the following circumscription: In a minimally different possible world, it is consistent with all of the possible worlds that are consistent with the speaker's knowledge in that hypothetical, minimally different world. As seems to become clear, the description of epistemic modal operators in the scope of a counterfactual operator requires possible worlds that are interpreted in another, non-actual, minimally different world. This is a very intricate matter that cannot entirely be solved here.

Likewise, it needs to be investigated to what extent a hypothetical assumption involves an assumption in the real world. Even if a speaker using *müssen* might indicate that he is not in a position to draw this particular conclusion, he nevertheless communicates an epistemic evaluation of the modified proposition. At least at some meta-level, he makes a claim about the validity of the proposition in the actual world.

In a similar fashion, this reasoning could equally apply to the non-verified premise interpretation of *müsste*. In this type of environment, the speaker would signal that he does not know whether the premise holds or not. If he knew that the premise were true, then he would draw the epistemic conclusion expressed by the epistemic modal verb.

An analysis that considers the entire act of conclusion as counterfactual could also account for those cases in which the speaker knows the embedded proposition to be false. As was pointed out in the preceding section, the usage of an epistemic modal operator indicates that the embedded proposition is not part of the speaker's (deictic centre's) knowledge. In the most canonical case, the speaker would not know that the embedded proposition is false either. This is most natural for counterfactual readings, as in examples (137) or (138). It has yet to be shown to what extent such configurations, where the modified proposition is known to be false, are also compatible with a non-verified premise interpretation.

Until this point, epistemic *müsste* behaves very similarly to epistemic *könnte*. But whereas *kann* can be easily replaced with its subjunctive counterpart *könnte* in most environments without drastically affecting the overall interpretation, *muss* cannot be replaced with *müsste* a number of contexts:

- (140) Der Wagen rollte vom Bahnsteig auf das Gleis und wird
 the car rolled from.the platform on the rail.track and is
 prompt von einem einfahrenden Zug erfasst und 40 Meter
 promptly by a approaching train hit and 40 Meter
 mitgeschleift. Der Bub muss einen besonderen Schutzengel
 with.dragged the boy must a special guardian.angel
 gehabt haben: Er kam mit leichten Verletzungen davon.¹⁰²
 have-PPP have-INF he came with minor injuries away
 ‘The car rolled from the platform onto the rail track and it was immediately hit by a
 passing train and dragged along a distance of 40 meters. The boy must have had a
 special guardian angel: he survived with minor injuries.’
- (141) Es muss ein schlimmes Bild gewesen sein, das sich der
 it must a bad picture be-PPP be-INF that REFL the
 Frau bot, die gestern morgen früh als erste am
 woman offered that yesterday morning early as first at.the
 Unfallort eintraf.¹⁰³
 accident.location arrived
 ‘For the woman, who arrived first at the accident yesterday early in the morning, it
 must have been a terrible scene to see.’
- (142) Eine Henauerin hat erzählt, dass sie vor dem Kirchgang
 a Henauerian has told that she before the church.going
 dem Bäcker einen Apfel gebracht habe. Nach dem
 the baker an apple brought have-SBJV.PRS after the
 Kirchgang hat sie ihn wieder abgeholt, schön im Teig
 church.going have she him again up.picked beautifully in dough
 gebacken, und es muss so gut geschmeckt haben!¹⁰⁴
 baked and it must so good taste-PPP have-INF
 ‘A woman from Henau said that before she went to church, she brought the baker an
 apple. After church, she picked it up again, baked in dough, and it must have tasted
 so good!’
- (143) Dabei muss er das Fahrzeug einer 29 Jahre alten Frau
 thereby must he the vehicle a-GEN 29 year old woman
 übersehen haben, die mit ihren Kindern auf dem Weg zu
 miss-PPP have-INF who with her children on the way to
 einem Freizeitpark war.¹⁰⁵
 a amusement.park was

102 DeReKo: A09/OKT.04501 St. Galler Tagblatt, 17/10/2009.

103 DeReKo: A09/JUL.07445 St. Galler Tagblatt, 30/07/2009.

104 DeReKo: A09/NOV.01850 St. Galler Tagblatt, 06/11/2009.

'In doing so, he must have missed the car of a 29 year old woman who was driving her children to an amusement park.'

- (144) Der Anblick, der sich den Rettern bot, muss schrecklich
the sight that REFL the rescuer offered must awful
gewesen sein.¹⁰⁶
be-PPP be-INF
'It must have been such an awful sight for the rescuers.'
- (145) Rund um mein Hotel in der Innenstadt gibt es nur
around around my hotel in the city centre gives it only
kostenpflichtige Parkplätze. Das muss ich wohl übersehen
with.costs parking that must I obviously miss-PPP
haben – prompt klebte an meinem Mietwagen ein Ticket.¹⁰⁷
have-INF promptly stucked at my hire.car a ticket
'Around my hotel in the city centre, there are only parking spaces where you have to pay to park. I must have missed that and there was soon a parking ticket stuck to my car.'
- (146) Es muss eine Herkulesarbeit gewesen sein, das weitversprengte
it must a hercules.work be-PPP be-INF the widely.scattered
Notenmaterial der 1813 uraufgeführten »Medea in Corinto« zu
sheet.music the-GEN 1813 premiered Medea in Corinto to
sammeln¹⁰⁸
collect-INF
'It must have been a Herculean task to collect the widely scattered sheet music of the "Medea in Corinto", which premiered in 1813.'

In all of the examples (140)–(146), a substitution of *muss* with *müsste* would affect the interpretation. Interestingly, the epistemic necessity modal *muss* can be more successfully be replaced with the epistemic probability modal verb *dürfte* in the given instances. This indicates that *müsste* cannot be considered as a necessity modal that involves a necessity that is slightly weaker than the one of *muss*; otherwise it would be expected that the replacement by *dürfte* should lead to an even lesser degree of acceptability. The analysis provided by Fritz (1997: 101) and Mortelmans (2000: 205), who argue that the presence of a subjunctive of the past morpheme weakens the degree of necessity, can therefore not be correct.

These examples constitute a revealing case for the identification of the precise semantics of *muss* and *müsste*. After *müsste* has been inserted in an example

105 DeReKo: BRZ09/JUL.25816 Braunschweiger Zeitung, 27/07/2009.

106 DeReKo: A09/FEB.01731 St. Galler Tagblatt, 07/02/2009.

107 DeReKo: BRZ09/JAN.04683 Braunschweiger Zeitung, 12/01/2009.

108 DeReKo: A09/OKT.04815 St. Galler Tagblatt, 19/10/2009.

as the ones given in examples (140)–(146), it just needs to be analysed how the context needs to be changed in order to make *müsste* fully acceptable again, as is illustrated in the modified version of example (140):

- (147) Der Bub müsste einen besonderen Schutzengel gehabt
 the boy must a special guardian.angel have-PPP
 haben
 have-INF

‘??(In this case) The boy must have had a special guardian angel.’

In order to repair the context according to example (147), one of the underlying premises needs to be adjusted. In the version with the indicative epistemic modal verb *muss* (cf. 140), the speaker bases his conclusion on at least two verified premises: {*the boy has been dragged along by a train, the boy has survived with minor injuries*}. In order to create an appropriate context for *müsste*, one of these verified premises has to be refuted or labelled as ‘non-verified’ or ‘counterfactual’. Depending on the context, it appears that the use of *müsste* requires the most prominent premise to be non-verified or counterfactual.

This could, again, be a hint that the instances of *müsste* with subjunctive past involve a conditional configuration in which the non-verified premise is hosted by the antecedent. In some cases, the antecedent is explicitly realised as a *wenn*-clause; in the other cases, it remains implicit. This also explains why epistemic *müsste* cannot express conclusions that are based on direct evidence from the utterance situation. In this case, the most prominent premise would be a state of affairs that is accessible by all sorts of senses; therefore, the premise would be verified already and impossible to contradict.

This behaviour reveals the nature of the subjunctive morpheme on *müsste*: It acts as a qualifier for the underlying evidence involved. The evidence upon which the epistemic conclusion is drawn needs to include premises that are not verified or even known to be false.

Concluding, epistemic *müssen* comes in two guises: The indicative form *muss*, and the subjunctive of the past *müsste*. As in the case of epistemic *könnte*, epistemic *müsste* occurs in two functions: It either indicates that one of the premises on which the epistemic conclusion is based is not verified, or it indicates that one of the premise is counterfactual. Unlike its indicative counterpart, the subjunctive epistemic necessity modal verb *müsste* is not acceptable in the scope of negation. In all of these aspects, *müsste* strongly resembles the subjunctive epistemic possibility modal verb *könnte*. But these verbs differ with respect to the extent to which they are interchangeable with their indicative cognates: Whereas the subjunctive epistemic necessity modal verb *müsste* can be more easily replaced with the indicative *muss*, the subjunctive epistemic possibility modal verb *könnte* can-

not be substituted with *kann* in most contexts without affecting the interpretation. In contrast, the indicative epistemic modal necessity verb *muss* withstands substitution with its subjunctive counterpart *müsste*, whereas the indicative epistemic possibility verb *kann* can always be substituted with its subjunctive cognate *könnte*.

2.2.3 *wollen*

The volitional modal verb *wollen* is well studied and there is considerable consensus about its behaviour. The semantic range covers the expression of volition and reported speech, as well as volition that originates in a referent distinct from the subject referent. Volitional semantics have remained fairly stable through the course of history, as shown by Bech (1951) and Fritz (1997: 44). Following the tradition established by Bech (1949: 38), *wollen* is generally considered as necessity modal verb that involves a modal source that lies within the subject referent.

2.2.3.1 Transitive uses

As has been noticed on various occasions, there are instances of *wollen* that occur with an accusative NP without infinitive, as has been pointed out by Raynaud (1977: 5, 20). The status of these occurrences is contested. On the one hand, there are authors such as Öhlschläger (1989: 69), who argue that these instances involve an ellipsis of the infinitive. On the other hand, there are authors such as Zifonun (1997: 1255), Erb (2001: 96) and Eisenberg (2004: 97), who argue that in these uses, *wollen* serves as a transitive verb. These authors illustrate their claim with passivised examples of *wollen*. Such patterns are also documented in corpora, as shown in examples (148)–(150):

- (148) ‘Man müsse zur Kenntnis nehmen, daß der Einzug von
 one must at notice take that the move-in-NOM of
 Ausländern in Gemeindewohnungen einfach von den Leuten nicht
 foreigners in flats.of.the.township simply by the people NEG
 gewollt wird, meinte Häupl.¹⁰⁹
 want-PPP PASS.AUX said Häupl
 ‘One has to acknowledge that the people simply do not want that foreigners move
 into township’s flats.’
 lit: The move in is not wanted by the people

109 DeReKo: N93/FEB.06544 Salzburger Nachrichten, 22/02/1993.

- (149) Nur der Waffenstillstand hat Bestand der von
 only the ceasefire has continuance that-REL.PRN.NOM from
 innen her kommt und von allen Kriegsparteien gewollt
 inside PAR comes and by all war.parties want-PPP
 wird¹¹⁰

PASS.AUX

'A ceasefire can only be succesful if it is proposed from the inside and if it is wanted by all of the warring parties.'

lit: A ceasefire is wanted by all of the warring parties

- (150) Die politisch-planerisch Verantwortlichen müssen begreifen,
 the political-planner-ADJ responsible.person must understand
 daß vor allem ein Theaterzentrum mit sozio-kultureller
 that foremost a theater center with socio-cultural
 Bedeutung von den Menschen dieser Stadt gewollt wird¹¹¹
 relevance by the people of.this city want-PPP PASS.AUX

'The people responsible for political planning must understand that the people of this city want a theatre centre with socio-cultural relevance.'

lit: That a theatre centre is wanted

Öhlschläger (1989: 69) acknowledges that *wollen* can occasionally be passivised, but from his perspective, it is not fully productive. As a consequence, *wollen* with an accusative NP has to involve an ellipsis of an infinitive. According to Öhlschläger (1989: 69), it is always the infinitive *haben* 'have' that is elided here. Yet, Öhlschläger's arguments are not plausible for two reasons. First of all, passivised *wollen* occurs much more frequently than passivised *können*. This is remarkable, as word forms related to *können* are much more frequent than those related to *wollen* in the archive W of the DeReKo corpus, upon which the study is based. So if *können* is considered as "fully productive" with respect to its passive, it remains mysterious why the passive of *wollen* should be "less productive". Whoever considers *können* to be a transitive verb has to consider *wollen*, as well. Secondly, if Öhlschläger (1989) were right in his assumption that *wollen* without an infinitive complement should be considered as an ellipsis of *haben*, it is expected that the examples in (148)–(150) should be derived from configurations in which the infinitive *haben* is spelled out overtly. However, after inserting an infinitive of *haben*, the acceptability of such configurations drastically decreases, as is highlighted in examples (151)–(153).

110 DeReKo: P91/NOV.08961 Die Presse, 29/11/1991.

111 DeReKo: R98/DEZ.102438 Frankfurter Rundschau, 19/12/1998.

- (151) * Der Einzug von Ausländern in Gemeindewohnungen wird
 the move-in of foreigners in flats.of.the.township PASS.AUX
 von den Leuten nicht haben gewollt
 by the people NEG have-INF want-PPP
- (152) * Ein Waffenstillstand wird von allen Kriegsparteien
 a ceasefire PASS.AUX.PST by all war.parties
 haben gewollt
 have-INF want-PPP
- (153) * Ein Theaterzentrum wird von den Menschen haben
 a theater.center PASS.AUX.PST by the people have-INF
 gewollt
 want-PPP

The contrast between examples (148) and (151) remains unaccounted for in an analysis that treats *wollen* with an accusative NP as an ellipsis of the infinitive *haben*.

There are further instances of *wollen* with NP that cannot be complemented with the infinitive *haben*, e.g. the question pattern in (154a):

- (154) a. A: Was willst du hier (*haben)?
 what want you here have-INF
- b. B: Ich will mit dir reden.
 I want with you talk-INF
- A: 'What do you want here?'
 B: 'I want to talk to you'

The *wh*-pronoun does not seem to be a canonical VP-anaphor. If this was the case, it should be possible to substitute *wollen* in example (154a) with other verbs such as *dürfen* or *müssen*, but this is not possible.

Nevertheless, it seems to be possible to coordinate an accusative NP complement with a bare infinitive complement of *wollen* in some contexts.

- (155) Wir wollen Sonne statt Reagan, ohne Rüstung leben.¹¹²
 we want sun instead.of Reagan without weapons live-INF
 'We want sunshine rather than Reagan, to live without arms.'

As is widely assumed, coordination requires the identity of the categories of both constituents. A more detailed discussion is given by Dougherty (1970: 850, 864), Jackendoff (1977: 51), Gazdar (1981: 157, 173), Schachter (1984: 269) and Pollard and Sag (1994: 202). Thus, the pattern in example (155) would presuppose that

¹¹² Joseph Beuys and BAP, election spot for the Green Party released in April 1982.

Sonne ‘sun’ has the same category as the infinitive complement *ohne Rüstung leben*. Accordingly, the constituent *Sonne* must be part of an infinitive that has an elided verbal head. Even if an analysis in terms of ellipsis might be attractive for this example, there are strong reasons for the existence of instances of transitive *wollen*, as the data on passivisation indicates. Alternatively, the pattern in (155) could be considered asymmetric coordination.

2.2.3.2 *dass*-Sätze

As has been pointed out by Becker (1836: 181), Welke (1965: 78), Raynaud (1977: 6, 20), Fritz (1997: 17), Erb (2001: 96) and Eisenberg (2004: 96) *wollen* occasionally selects finite *dass*-clauses. Welke (1965: 78) suggests that the *dass*-clause is the result of a transformation that has been applied to the infinitive complement. Likewise, Öhlschläger (1989: 70) stresses that, in these patterns, the *dass*-clause fulfils the same function as the infinitive complement. Therefore, he argues that these configurations do not involve an ellipsis of an infinitive.

- (156) Unser Chef will nicht, dass so viele Ausländer bei uns drin
 our boss wants NEG that so many foreigners in us in
 sind¹¹³
 are
 ‘Our boss does not want so many foreigners enter our place.’
- (157) Nur 32 Prozent wollten, dass Schwarz-Gelb weitermacht.¹¹⁴
 only 32 percent wanted that black-yellow continues
 ‘Only 38 percent wanted that the Black-Yellow coalition stays in power.’

This clearly indicates that the infinitive is not mandatory with *wollen*. The fact that the subject of *wollen* and the subject of the *dass*-clause are disjoined in reference in the most canonical case has motivated some authors, such as Szumlakowski-Morodo (2006: 325), to assume that this configuration is due to a syntactic restriction. In contrast, Vater (2001) and Reis (2001: 303) have illustrated that the two subjects can occasionally bear the same index. Such patterns are also found in corpora:

- (158) Ich will, dass ich meinen Kindern auch Elefanten im
 I want that I my children also elephants in.the
 Tiergarten zeigen kann.¹¹⁵
 zoo show-INF can

¹¹³ DeReKo: BRZ07/JUN.09793 Braunschweiger Zeitung, 12/06/2007.

¹¹⁴ DeReKo: HMP11/MAR.02571 Hamburger Morgenpost, 28/03/2011.

‘I also want to be able to show my children the elephants in the zoo.’

However, configurations in which the subject referent of the matrix clause and the subject referent are identical are undoubtedly rare and rather exceptional. There seems to be yet another restriction on subjects referent. The anti-performative restriction observed by Hinterwimmer (2014) seems to hold for *wollen*, too.

Unlike an imperative (236), *wollen* with *dass*-clause cannot be used to directly refer to an addressee out of the blue (160). The latter pattern asserts the existence of an intentional act settled in the common ground.

(159) Geh jetzt!
go-IMP now
‘Go now!’

(160) # Ich will, dass Du jetzt gehst!
I want that you now go
‘I want you to go now!’

But then, example (160) becomes felicitous if the speaker already uttered an imperative like (236) and uses *wollen* with *dass*-clause to insist on his wish.

2.2.3.3 Control infinitives with event modification

The status of volitional *wollen* with an infinitive is less controversial. Most authors, such as Bech (1949: 5), Welke (1965: 78), Raynaud (1977: 19), Höhle (1978: 84) and Diewald (1999: 140), assume that it involves a proper referential subject argument that encodes the modal source besides its infinitive argument. In more recent approaches, these verbs are considered as control verbs. Accordingly, Öhlschläger (1989: 119), Kiss (1995: 162), Reis (2001: 302), Axel (2001: 40), Erb (2001: 78), Wurmbrand (2001: 170) and Abraham (2001: 18, 2002: 36, 2005: 241, 257, 261) classify the volitional use of *wollen* as a control verb. It is not uncontroversial that it assigns a semantic role to its syntactic subject.

(161) Zu Guttenberg will das Jagdbombergeschwader 33
Zu Guttenberg wants the fighter.bomber.squadron 33
modernisieren.¹¹⁶
modernise-INF
‘Zu Guttenberg wants to modernise the 33rd fighter bomber squadron.’

Becker (1836: 181) considers *wollen* a necessity modal verb with a particular specification. Likewise, Bech (1949: 5, 39) argues that the strength of the modal re-

¹¹⁵ DeReKo: NUN11/MAR.02889 Nürnberger Nachrichten, 28/03/2011.

¹¹⁶ DeReKo: RHZ10/JAN.06017 Rhein-Zeitung, 15/01/2010.

lation expressed by *wollen* resembles the one expressed by *müssen* and *sollen*, rather than the one encoded by *können*, *dürfen* and *mögen*. In a similar way, Calbert (1975: 36 Fn.2), Ehrich (2001: 165) and Remberger (2010: 165, 169) point out that *wollen* is most appropriately analysed as a necessity modal verb that involves a necessity which has its source within the subject argument referent. It can be distinguished from the control use of *müssen*, which expresses a physical need by means of the ordering source. The universal quantifier contributed by *wollen* quantifies over those worlds that are consistent with the preferences of the speaker.

2.2.3.4 Control directionals with event modification

Like *können* and *müssen*, the volitional verb *wollen* can frequently be found with verbless directional phrases.

- (162) Deutschland will weg vom Atomstrom.¹¹⁷
 Germany wants away from nuclear.electricity
 ‘Germany wants to move away from nuclear electricity.’

As was demonstrated in Section 2.2.1.4, configurations such as the one in (162) cannot be efficiently captured as ellipses of an infinitive.

2.2.3.5 Raising infinitives with event modification

Bech (1949: 9) has already acknowledged that *wollen* occasionally occurs with inanimate subject NPs. As the syntactic subject is not a licit bearer for an experienter role, a canonical volitional interpretation is not appropriate. In a similar fashion, Welke (1965: 85) observes uses of *wollen* with impersonal subjects which involve a semantics which cannot easily be captured. In later works such as those by Stechow and Sternefeld (1988: 446), Öhlschläger (1989: 170), Kiss (1995: 161, 167), Reis (2001: 302) and Wurmbrand (2001: 170), these occurrences are considered as the raising use of *wollen*.

As some of these authors emphasize, *wollen* does not appear with a figurative meaning here. The inanimate subject does not receive an anthropomorphic interpretation resulting in a metaphoric volitional reading. There is no semantic relation at all between its syntactic subject and *wollen* in these cases. This is most convincingly illustrated by the fact that this use of *wollen* occurs with non-referential subjects.

It seems that at least three different types of *wollen* with raising structure have to be differentiated. First of all, there is one type which preferably occurs in negative polarity environments (cf. 163–168). Brinkmann (1962: 367) already observed

¹¹⁷ DeReKo: HMP11/MAR.01535 Hamburger Morgenpost, 17/03/2011.

that there is a use of *wollen* which occurs only in negative contexts, and which does not encode volition of the subject referent. Instead, it expresses that the event denoted by the embedded infinitive continues to happen against the expectation of the discourse participants.

- (163) Heute will es scheinbar gar nicht mehr aufhören zu regnen.¹¹⁸
 today want it obviously INTN NEG more stop-INF to rain-INF
 ‘Today, it does not seem to want to stop raining.’
- (164) Als das Filmteam um »die Knef« in Nürnberg ankam, wollte
 As the film.crew around the Knef in Nürnberg arrive wanted
 es nicht aufhören zu regnen.¹¹⁹
 it NEG stop-INF to rain-INF
 ‘When the film crew, along with ‘the Knef’, arrived in Nuremberg, it did not want to stop raining.’
- (165) Auch nach 24 Jahren Wahnsinn und wahnsinnigen 17 Studioalben
 also after 24 years madness and madly 17 studio
 will es einfach nicht ruhig werden um die
 want it simply NEG become quiet around the
 Thrash-Metal-Supernova „MegaDave” Mustaine.¹²⁰
 Trash-Metal-Supernova “MegaDave” Mustaine
 ‘Even after 24 years of madness and an unbelievable 17 studio albums, there is nothing that can stop the Trash-Metal-Supernova “MegaDave” Mustaine.’
- (166) Ein Interessent wartet schon lange auf den erlösenden Anruf
 an interested waits already long for the liberating call
 Haider’s, aber es will einfach nicht läuten: Der F-Sprecher
 Haider-GEN but it want simply NEG ring: The F-spokesman
 im Landesschulrat, Erich Petschacher.¹²¹
 in.the regional.education.authority Erich Petschacher
 ‘There is a person who is interested, who has been waiting for Haider’s liberating call for a long time, but it just won’t ring: the F spokesman in the regional education board: The spokesman of the F in the regional education authority, Erich Petschacher.’
- (167) Irgendwie will und will es nicht Frühling werden.¹²²
 somehow want and want it NEG spring become
 ‘Somehow, it does not want to be spring.’

118 DeReKo: RHZ02/FEB.07812 Rhein-Zeitung, 12/02/2002.

119 DeReKo: NUN04/MAI.01869 Nürnberger Nachrichten, 21/05/2004.

120 DeReKo: HMP07/JUN.01431 Hamburger Morgenpost, 14/06/2007.

121 DeReKo: K99/JUN.45893 Kleine Zeitung, 22/06/1999.

122 DeReKo: RHZ09/MAR.09602 Rhein-Zeitung, 11/03/2009.

- (168) Im Gegensatz zu seinen Klassenkameraden, will und will bei
 in contrast to his class.mates wants and wants at
 ihm kein einziges Schamhaar wachsen, obwohl er doch wie
 him no single pubic.hair grow although he PAR like
 toll in Katharina verschossen ist.¹²³
 insane in Katharina mad is
 ‘In contrast to his classmates, not a single pubic hair to grow, even though he has a
 crush on Katharina.’
- (169) MAX: [...] Das will mir nicht gefallen.¹²⁴
 this wants me NEG please
 ‘This does not please me.’

Example (169) illustrates that this interpretation is already documented for the late 18th century. Typically, this variant of negated *wollen* co-occurs with the reinforcing sentence adverb *einfach* ‘simply’, as illustrated in examples (165)–(166) or re-duplication of *wollen* (cf. 167–168). It merits closer attention that the string *will und will* seems to be restricted to negative polarity environments: among 239 hits found in the DeReKo corpus based on the query with the string *will und will*, there is not a single one without a negation. This is a strong indicator in favour of an analysis that treats this use of *wollen* as negative polarity item.¹²⁵

The exact interpretation of the negative polar raising verb *wollen* is hard to capture. Even if the examples (163)–(168) do not involve an overt bearer of the volition, it appears that such a referent is contextually required. All of the examples describe a state of affairs that does not happen to be. But moreover, they are only fully acceptable if there is a referent who wants that state of affair to happen. The utterance in example (167) is only felicitous if there is a referent who wants it to be spring. Obviously, this contribution is most efficiently captured by the presupposition ‘x wants *p* to happen’.

The interpretation of the negative polar raising verb *wollen* is, to some extent, reminiscent of the behaviour of concessive epistemic *mögen*, as has been pointed out by Welke (1965: 110), Allard (1975: 69, 70), Öhlschläger (1989: 187) and Diewald (1999: 236). Both patterns involve some referent who is the source of a volition, but that is not overtly encoded in the clause. This analysis is furthermore indirectly supported by Schoetensack (1856: 294). As he observes, there are further uses of *mögen* that involve a volition attributed to a third party, as in *er möge hereinkom-*

¹²³ DeReKo: M05/MAI.35869 Mannheimer Morgen, 02/05/2005.

¹²⁴ Friedrich von Schiller *Wallensteins Tod*, II. Aufzug, 7. Auftritt (1799).

¹²⁵ Corpus query carried out on 21th March 2012 based on the string *will ’und’ will*.

men ‘He likes-SBJV.PRS enter / fig. He may enter’. In this case, *möge* expresses that the embedded proposition is consistent with the wishes of the speaker.

A contrasting analysis is suggested by Gergel and Hartmann (2009). They assume that *wollen*, in its volitional interpretation, is a raising verb which does not give up its ability to assign a thematic role to identify the source of volition. In the canonical case, it is the subject argument of the embedded infinitive that raises to the syntactic subject position of *wollen* (SpecVP) and receives the experiencer role from *wollen*. Furthermore, they argue that depending on the type of embedded predicate the raised argument can also be a dative object. In the case of impersonal verbs such as *gelingen* ‘succeed’ or *schmecken* ‘taste’, the least oblique argument is an experiencer dative NP which is claimed to be raised into the subject of *wollen*, where it should be identified as source of volition, according to the analysis put forth by Gergel and Hartmann (2009: 337).

(170) *Ihm will einfach nichts gelingen.*¹²⁶
 him-DAT wants simply nothing succeed
 ‘He just doesn’t succeed at anything (although he tries....)’

(171) *Dem Großvater will die Suppe nicht schmecken.*¹²⁷
 the-DAT grandfather wants the soup-NOM NEG like
 ‘The grandfather does not like/want to like the soup.’

According to their analysis, the experiencer argument of *wollen* is identified with the dative NP *ihm* in example (170), and the dative NP *dem Großvater* in example (171). As a consequence, they conclude that all modal verbs in German are raising verbs (General Raising Hypothesis). Some of them, such as *wollen*, assign thematic roles to their syntactic subjects nevertheless. Thus, Gergel and Hartmann (2009: 350) assume that raising into theta position is possible, abandoning the classical Theta Criterion.

However, their account suffers from a major shortcoming. There are examples which are very similar to the one they discuss and which do not contain any NP that could potentially be identified as the source of volition, or the experiencer argument of *wollen*, e.g. cases in which the embedded predicate is *klappen* ‘work out’, as in example (172).

(172) *Die Jungs haben brutal gekämpft, aber es will einfach nicht klappen mit der Goldmedaille.*¹²⁸
 the boys have brutally struggled but it want simply NEG
 work.out with the gold.medal

¹²⁶ As quoted in Gergel and Hartmann (2009: 331).

¹²⁷ As quoted in Gergel and Hartmann (2009: 331).

‘The boys fought hard but it just won’t be enough for the gold medal.

Lacking an appropriate animate argument, *klappen* does not provide an appropriate candidate that could be identified as the source of volition. Moreover, it involves a non-referential subject, which in turn indicates that it can only be embedded by a raising verb. Similar reasoning applies to the examples (163)–(168), they cannot be accounted for by the analysis suggested by Gergel and Hartmann (2009).

The alternative outlined here is to analyse the examples (170) and (171) discussed by Gergel and Hartmann (2009) not as instances of oblique raising of dative objects into theta positions, but to subsume them under a more general phenomenon. Accordingly, they could be analysed along the same lines as the ones above.

Furthermore, these examples are not instances of ‘weak *wollen*’ discussed by Ehrich (2001: 165). According to Bech (1949: 5), she assumes that some instances of *wollen* carry an underlying possibility operator, rather than a necessity operator. In any case, as these uses also need to overtly specify their source of volition, they could not account for the patterns in (163)–(168) and (172), as these clauses do not involve appropriate arguments.

Apart from the negative polar raising uses of *wollen*, there seem to be at least two further types of raising patterns. As has been shown by Helbig and Buscha (2001: 121), there are occurrences of *wollen* which seem to express a mere necessity, and which can be replaced with *müssen* without affecting the interpretation too much.

Arguably, these uses should also be considered as raising verbs. Such uses become evident with embedded predicates that are passivised. Often, they involve a promoted theme argument that is inanimate. As has been shown in the Sections 2.2.1.3 and 2.2.2.3, such environments are typical of raising verbs. As can be seen, this use of *wollen* is occasionally modified by the adverbs *erst* and *einmal*.

- (173) Der Name des Coiffeurgeschäfts will deshalb gut
the name the-GEN hairdresser.shop-GEN wants therefore well
gewählt sein.¹²⁹
choose-PPP be-INF

‘Therefore, the name of the hair saloon needs to be well chosen.’

128 DeReKo: M11/MAR.01983 Mannheimer Morgen, 05/03/2011.

129 DeReKo: A09/MAI.04520 St. Galler Tagblatt, 14/05/2009.

- (174) Dazu kommen die Länder Osteuropas, deren
to.it come the countries Eastern.Europe-GEN REL.PRN.GEN
Sprung in die Marktwirtschaft auch erst einmal finanziert
leap in the market.economy also first once finance-PPP
sein will.¹³⁰
be-INF wants
'In addition to this, there are the Eastern European countries, whose leap into a market economy also needs to be financed.'
- (175) Ach, du schöne Ferienzeit. Und was wäre sie ohne
oh you beautiful holiday and what was she without
Vorfreude? Doch will die schönste Zeit des Jahres
anticipation but wants the beautiful-SUP time the-GEN year-GEN
auch gut vorbereitet sein.¹³¹
also well prepare-PPP be-INF
'Oh, you beautiful holidays! And what would it be without pleasant anticipation? But the most wonderful time of the year also needs to be well prepared.'
- (176) Eine Lok ohne Wagen kostet schon einige Euro. Und
a locomotive without cars cost already some Euro and
auch eine gute Werkzeugausstattung will erst einmal bezahlt
also a good tool.equipment wants first once pay-PPP
sein.¹³²
be-INF
'A locomotive without cars already a lot of money. And also, a good tool kit needs to be paid for first.'
- (177) Die Betreiber des Capitol schätzen den entstandenen
the operators the-GEN Capitol-GEN estimate the caused
Schaden auf rund 60 000 Euro – ein Loch, das erst einmal
damage at about 60 000 Euro a hole that first once
gestopft werden will.¹³³
plug-PPP PASS.AUX wants
'The operators of the Capitol estimate that the damage amounts to 60 000 Euros – a hole that one has yet to close/that is not so easy to close.'

130 DeReKo: NUN90/OKT.01381 Nürnberger Nachrichten, 20/10/1990.

131 DeReKo: BRZ09/APR.00836 Braunschweiger Zeitung, 02/04/2009.

132 DeReKo: RHZ07/DEZ.22127 Rhein-Zeitung, 27/12/2007.

133 DeReKo: M02/SEP.68278 Mannheimer Morgen, 13/09/2002.

- (178) Auch hier wird sich erweisen, daß [...] nicht nur einfach
 also here will REFL prove that NEG only simply
 Glanz zu ernten ist, sondern Jahr für Jahr zwölf Monate harte
 brilliance to harvest is but year for year twelve months hard
 organisatorische Arbeit den Erfolg begründet. Diese Arbeit will
 organisational work the success bases this work wants
 erst einmal geleistet sein.¹³⁴
 first once perform-PPP be-INF

'Here, too, it will be shown, that [...] not just brilliance is to be harvested, but that the basis of this success is hard organisational work, 12 months a year, year after year. This work has yet to be done.'

The precise interpretations of these uses of *wollen* are difficult to capture. In example (173), *wollen* certainly does not express a volition that is attributed to the subject *der Name des Coiffeurgeschäfts* 'the name of the hair saloon'. Rather, this use does not encode any volition at all. Without significantly altering the interpretation of the clause, it can be substituted with the necessity modal verb *müssen*. Yet there are some subtle semantic differences that remain to be captured.

Finally, there are obvious raising uses of *wollen* which contribute a meaning that is even more difficult to isolate. These cases appear to occur with verbs like *scheinen* 'seem'.

- (179) Fast will es scheinen, als müsse „Derevo“ an diesem
 almost wants it appear-INF as must Derevo on this
 Freitagabend hoch über der Stadt das Ende seines Stücks
 friday.night high over the city the end it-GEN piece-GEN
 alleine feiern.¹³⁵
 alone celebrate-INF

'It seems almost as if 'Derevo' will have to celebrate the end of his piece alone high above the city.'

- (180) Der See wollte heute randlos erscheinen.¹³⁶
 the lake wanted today borderless appear-INF
 'The lake appeared to go on forever.'

As has been shown, *wollen* occurs in a couple of environments as a raising verb. However, in each of the three cases discussed above, the semantic contribution of *wollen* is rather hard to capture.

¹³⁴ DeReKo: P94/SEP.30244 Die Presse, 09/09/1994.

¹³⁵ DeReKo: RHZ03/JUL.21748 Rhein-Zeitung, 29/07/2003.

¹³⁶ DeReKo: WAM/EFP.00000 Walser, Martin: Ein fliehendes Pferd. – Frankfurt a.M., (1978), p. 126.

2.2.3.6 Raising directionals with event modification

The negative polar raising use also occurs with verbless directional phrases. The examples (181)–(183) involve inanimate subject referents that are not likely to be identified as a source of volition. Moreover, they share some preferences with the negative polar raising pattern of *wollen*. First of all, *wollen* expresses a similar meaning. Secondly, it frequently occurs with the reinforcing adverb *einfach* ‘simply’ (cf. 182) and occasionally, it can be found with a re-duplication of the finite verb (cf. 183).

- (181) inzwischen ist es ein Uhr nachts, aber mir will die
meanwhile is it one o'clock night but me wants the
Geschichte nicht aus dem Sinn.¹³⁷
story NEG out the mind
‘Meanwhile, it is one o'clock in the morning, but I don't want to get the story out of my mind.’
- (182) Ich möchte lernen, aber der Schulstoff will einfach nicht in
I want learn-INF but the lesson want simply NEG in
meinen Kopf!¹³⁸
my head
‘I would like to revise, but I simply can't keep the material in my mind.’
- (183) Stäheli zittert, bangt, verzweifelt – der Puck will und will
Stäheli shivers trembles despairs the puck wants and wants
nicht ins Tor.¹³⁹
NEG in.the goal
‘Stäheli shivers, trembles, and despairs – but the puck just doesn't want to go into the goal.’
- (184) Das will mir nicht ein.¹⁴⁰
this wants me NEG in
‘I cannot understand this.’

As with the raising use of *wollen*, which embeds infinitives, this pattern is attested for the 18th century, as illustrated in example (184).

137 Fyodor Mikhaylowich Dostoyewsky, *Der Idiot*, translated by Svetlana Geier, p. 221.

138 DeReKo: A00/NOV.78588 St. Galler Tagblatt, 15/11/2000.

139 DeReKo: A08/MAR.06383 St. Galler Tagblatt, 15/03/2008.

140 Gotthold Ephraim Lessing, *Nathan der Weise*, IV. Aufzug, 7. Auftritt, (1779).

2.2.3.7 Control infinitives with clause modification

As was already observed by Becker (1836: 181), Schoetensack (1856: 294), Curme (1922: 322) and Bech (1949: 6), in some instances *wollen* refers to a claim attributed to the subject referent. Some authors, such as Öhlschläger (1989: 233), Abraham: 11 (2001: 11, 2002: 27, 2005) and Reis (2001: 287 Fn. 1), assume that this use of *wollen* is identified as the epistemic reading of *wollen*.

Indeed, this use of *wollen* shares a couple of the essential characteristics with canonical epistemic modal verbs such as *können* and *müssen*. As soon as *wollen* refers to a claim of the subject referent, it can embed a predication consisting of an identified individual and a predicate that refers to an event in the past (cf. 185–187), or a predicate that denotes permanent states that cannot be changed (cf. 188–189). This parallel behaviour has already been pointed out by Abraham (2001: 11, 2005).

- (185) Sieben Packerl Rotwein will er vor dem Prozess
seven packets red.wine wants he before the process
konsumiert haben.¹⁴¹
consume-PPP have-INF
'He claims to have consumed seven boxes of red wine prior to the trial.'
- (186) So will sie eine „Depression mit psychotischer Färbung” bei
So wants she a depression with psychotic color at
Pleger erkannt haben.¹⁴²
Pleger recognise-PPP have
'With Pleger/ In Pleger, she claims to have seen “depression with a touch of psychotic behaviour”.'
- (187) Sein Landsmann Frederick Albert Cook will bereits am 21. April
his countryman Frederick Albert Cook wants already at 21 april
1908 dort gewesen sein.¹⁴³
1908 there be-PPP be-INF
'His fellow countryman Frederick Albert Cook claims to have already been there on 21 April 1908.'
- (188) Er will angeblich der alleinige Täter sein.¹⁴⁴
he wants reportedly the sole culprit be-INF
'He claims to be the sole culprit.'

141 DeReKo: NON09/JUL.08001 Niederösterreichische Nachrichten, 15/07/2009.

142 DeReKo: NON09/JUL.02654 Niederösterreichische Nachrichten, 07/07/2009.

143 DeReKo: RHZ06/NOV.30695 Rhein-Zeitung, 30/11/2006.

144 DeReKo: HMP09/NOV.00548 Hamburger Morgenpost, 05/11/2009.

- (189) Badhapur ist ein Sadhu, ein Weiser, Gerechter. 106 Jahre will die
 Badhapur is a Sadhu, a sage righteous 106 years wants the
 hagere Gestalt mit dem langen grauen Haar schon alt
 rawboned figure with the long grey hair already old
 sein.¹⁴⁵
 be-INF

‘Badhapur is a Sadhu, a wise man, a religious man. This haggard form with long grey hair already claims to be 106 years old.’

Note that the canonical circumstantial volitional interpretation is not possible in the examples given above. In early descriptions such as Schoetensack (1856: 294), reportative *wollen* was analysed as a pattern that involves a kind of ellipsis. As he argues in more detail, there is a mediating clause that has been elided: *er will, (dass man glaube), dass er ihn gesehen habe* ‘He wants (that one thinks) that he has seen him’. As Bech (1949: 6) emphasises, the canonical volitional use of *wollen* targets the “realisation” of the embedded predication. The uses above, however, target the “reality” of the embedded predication. This contrast corresponds exactly to the one between circumstantial interpretations of *können* or *müssen* and their epistemic counterparts.

As Truckenbrodt (2006: 263–268) amongst others, has pointed out, any sentential speech act type conveys a volitional component. As with assertions, the speaker wants the addressee to add the embedded proposition to the Common Ground. As it seems, the function of the reportative use of *wollen* is to express this volitional component of declarative clauses and associate it with the subject referent.

In opposition to canonical epistemic modal verbs, the use of *wollen* discussed above is not subject to the CoDeC in the same way. Some authors, such as Palmer (1986: 72), Schenner (2009) and Faller (2010: 661), argue that it merits a different name: ‘quotative’ or ‘reportative’ modal verb. Whereas an epistemic modal verb indicates that the modified proposition is not part of the speaker’s knowledge, the proposition that is embedded reportative *wollen* (cf. 185–189) can, in principle, be part of the speaker’s knowledge, as will be shown in more detail in Chapter 5. As will be seen there, the relevant attitude holder for the evaluation of reportative *wollen* seems to be the subject referent, rather than the speaker. In contrast to epistemic modal verbs, the speaker may agree or disagree with the modified proposition which is labelled as a claim of another referent. He may even know that it is true or false. Similar observations have been made by Öhlschläger (1989: 235), Ehrich (2001: 157), Colomo (2011: 241) and Faller (2011: 4, 2012: 289).

¹⁴⁵ DeReKo: NUN99/OKT.02110 Nürnberger Nachrichten, 23/10/1999.

As has been shown in Sections 2.2.1.5 and 2.2.2.5, epistemic modal verbs can be characterised in terms of the environments from which they are excluded. Reis (2001: 294, 296) observes that reportative *wollen* occurs more readily in environments in which epistemic modals are difficult to interpret or entirely excluded, such as non-finite environments or in questions.

Thus, there are two aspects in which reportative *wollen* differs from canonical epistemic modal verbs. It is clear that these two aspects might be derived from a major syntactic difference. Whereas epistemic modal verbs are always raising verbs which are evaluated with respect to a super-ordinate attitude holder, which is the speaker in most cases, *wollen* remains to be a control verb, even in its quasi-epistemic use, as has already been stressed by Öhlschläger (1989: 121) and Reis (2001: 302). The crucial difference is that reportative *wollen* introduces the attitude holder as its proper argument. Assuming that each epistemic modal operator contains a variable for the epistemic agent who undertakes the evaluation, the variable for the epistemic agent is always locally bound by the subject referent in the case of reportative *wollen*. Being already instantiated, the variable contributed by the operator is not subject to the strict conditions of identifications anymore. Accordingly, the reportative modal verb can be used more flexibly. The precise mechanism of identification will be discussed in Chapter 5.

Finally, reportative *wollen* turns out to be an ideal candidate to check the nature of *wh*-clefts. Thráinsson and Vikner (1995: 62) and Erb (2001: 88) assume that in *wh*-clefts, control verbs can only be separated from their infinitive complements, whereas raising verbs cannot. According to them, the subject in the *wh*-clause needs to be licensed by an external theta role. This would explain why epistemic modal verbs are ruled out in such configurations, as, being raising verbs, they lack an external theta role.

If their view is correct, *wollen* could be expected to be separated from its infinitive complement in *wh*-clefts, as is illustrated in (190), which is derived from the corpus example (186):

(190) ?? Was sie vielmehr will, ist bei Pleger eine „Depression mit
 what she rather wants is at Pleger a depression with
 psychotischer Färbung” erkannt (zu) haben.¹⁴⁶
 psychotic color recognise-PPP to have-INF

Intended reading: ‘What she claims is to have recognized that Pleger has “depression with a touch of psychoticism.”’

In this example, the licencing conditions are fulfilled. The finite verb in the *wh*-clause assigns a theta role to the subject NP *sie*. Nevertheless, the examples that involve reportative instances of *wollen* seem to be less acceptable than those cases with volitional *wollen*, which are discussed in Section 4.8. If Thráinsson

and Vikner (1995: 62) and Erb (2001: 88) are right in claiming that only control verbs can be separated from their infinitive complements, the availability of an external theta role cannot be the sole condition here. As will be shown in Section 4.8, there are alternative explanations.

In some rare cases, the referent to which the claim is attributed can be an argument different from the matrix subject. In example (191), reportative *wollen* embeds the idiomatic pattern *ein Begriff sein* with a dative NP that encodes the experiencer argument. Crucially, it is the dative NP that bears the most prominent thematic role in this pattern, according to the hierarchy of thematic roles proposed by Dowty (1991). Surprisingly, reportative *wollen* can embed such a type of predicates in which the experiencer is identified with a dative NP, rather than a nominative NP. Nevertheless, the referent to which the claim is attributed is the dative NP *Strasser* rather than the matrix subject *Mensdorff-Pouillys Firma Valurex*.

- (191) Auch Mensdorff-Pouillys Firma Valurex, die
 also Mensdorff-Pouilly-GEN enterprise-NOM Valurex-NOM REL.PRN
 in dem Deal als Drehscheibe fungierte, will Strasser bis
 in the deal as turning.device functioned wants Strasser-DAT until
 heute kein Begriff sein („Valurhops oder wie die
 today no-NOM notion-NOM be-INF valurhops or how that
 heißt“).¹⁴⁷
 called.is

‘Strasser claims that Mensdorff-Pouilly’s enterprise ‘Valurex’, which functioned as the key turning point in the deal, was not known to him („Valurhops, or whatever it is called”).’

This example indicates that the instance of reportative *wollen* cannot be a canonical control verb as the semantic role is evidently not assigned to the matrix subject but to a dative object that depends on the embedded predicate *ein Begriff sein*. Moreover, an interpretation as a non-reportative instance of the raising pattern of *wollen* is not plausible in the example above, in which an accused former minister claims that he was not informed about a certain deal. Yet, it has to be checked what repercussion this example has on the analysis of reportative *wollen*. It is conceivable that this pattern is not generally accepted. It could turn out that this configuration could be accounted for by the oblique raising analysis illustrated by Gergel and Hartmann (2009: 337). As they assume, *wollen* can discharge its semantic role that is designated to the subject argument, alternatively, to the dative argument of the embedded infinitive. But as has been illustrated in Section 2.2.3.5, their analysis has some shortcomings that have yet to be overcome.

¹⁴⁷ <http://www.orf.at/stories/2126743/2126744/>, accessed on 20th June 2012.

Note that this example also involves a negative quantifier in subject position. As will be shown in Section 2.2.8.7, such configurations exhibit a mysterious interaction with reportative control verbs.

2.2.3.8 Raising infinitives with clause modification

Likewise, there are instances of clause modifying *wollen* that do not seem to select a referential subject argument. In these uses, *wollen* is highly reminiscent of concessive epistemic *mögen*, which is discussed in more detail in Section 2.2.7.7. As is typical of sentences that involve a modal operator with concessive meaning, the main clauses in examples (193) and (194) are followed by a clause that is introduced by the adversative conjunction *aber* ‘but’.

- (192) Warum hat Schwenker, wenn es tatsächlich so gewesen sein
 why has Schwenker if it indeed so be-PPP be-INF
 wollte, das nicht gleich erzählt?¹⁴⁸
 wanted that NEG immediately told

‘If it really was like that, why didn’t Schwenker say that immediately?’

- (193) Der etwa 69 800 Mark teure Cross Country [...] will
 the about Mark expensive cross country wants
 zwar kein Geländewagen sein, doch in seiner Nähe
 although no all-terrain.vehicle be but in his closeness
 sehen ihn die Volvo-Leute schon.¹⁴⁹
 see him the Volvo-people yet

‘Though the Cross County, which costs about 69,800 DM, may not be an off-road vehicle, it is considered by the Volvo people as something comparable.’

- (194) Ich will den Arbeitgebern sicher nicht gefallen wollen,
 I want the employer certainly NEG please-INF want-INF
 aber ich möchte in schwierigen Zeiten ein Optimum für die
 but I would.like.to in difficult periods an optimum for the
 Arbeitenden herausholen.¹⁵⁰
 employees get.out-INF

‘Certainly, I might not please the employers but I would like to get the maximum for the employees in such difficult times such as now.’

Some speakers prefer to analyse the inanimate subject referent in example (193) as an anthropomorphic subject. This analysis would not account for the case where

148 DeReKo: HMP09/DEZ.00650 Hamburger Morgenpost, 07/12/2009.

149 DeReKo: M97/712.03322 Mannheimer Morgen, 10/12/1997.

150 DeReKo: E98/NOV.28535 Züricher Tagesanzeiger, 07/11/1998.

wollen selects a non-referential subject in example (192), neither for example (194), in which *wollen* does not only occur as a matrix verb but also as the infinitive complement. The only plausible interpretation is one that is similar to the one of concessive-epistemic *mögen*. The speaker who utters such a configuration indicates that he acknowledges that the embedded proposition is possible, even if he considers the content of this proposition irrelevant to the ongoing discourse.

At this point, it is important to emphasise that both verbs, *wollen* and *mögen*, express a volitional meaning in control structures. It seems, that parts of these semantic features are still active in concessive epistemic use. Thus, there are good reasons to acknowledge that *wollen* has an independent use as an epistemic raising verb, even if this use is rather marginal. This reasoning is further supported by instances of other volitional verbs such as *sollen*, which also exhibit a concessive resonance, as in example (265), discussed in Section 2.2.6.4.

2.2.4 *dürfen*

The case of *dürfen* ‘be.allowed.to’ turns out to be of particular interest. As will be demonstrated, its indicative use can never be used with an epistemic interpretation, in contrast to all other items that are considered as modal verbs. However, with a subjunctive of the past morphology, an epistemic reading becomes available. As can be clearly seen, it is not plausible to subsume the epistemic use of *dürfte* under the use of *dürfen*: Whereas circumstantial *dürfen* involves a modal force that corresponds to a possibility, epistemic *dürfte* cannot be considered as a possibility verb anymore; rather, it is a verb that expresses probability. As most authors, such as Kratzer (1991: 650), implicitly assume that the modal force for a lexical item always remains the same, *dürfen* and *dürfte* have to be considered as two separate independent lexical items.

In contrast to the previous cases, *dürfen* does not involve transitive uses in Contemporary German, although some such uses are attested in the Early New High German period, in which *dürfen* occurs without an infinitive complement. But at this point, it is not entirely clear whether these uses are due to confusion with the verb *bedürfen* ‘need’. The most important uses of *dürfen* are the permissive uses with bare infinitive complements. As already illustrated in Section 2.1.4, *dürfen* does not occur very frequently.

2.2.4.1 Transitive Uses

There are a couple of cases occurring in texts from the Early New High German period in which *dürfen* is only combined with a NP. Interestingly, there seems to

be a certain flexibility with respect to case assignment. Examples (197)–(200) are taken from the *Deutsches Wörterbuch* (DWB). As the editor of the relevant entry argues, *dürfen* can either select genitive NPs, as in (199)–(200), or accusative NPs, as in (197)–(198). This alternation merits closer attention, as the four examples all come from the same text.

- (195) Der Oberst meinte/ es were ein betrug dahinder/ vnd sagte/
the colonel thought it was a deception behind and said
Sie solten hinfahren/ denn er duerffte der Wahr
they should away.go because he may-SBJV.PST the-GEN good
nicht¹⁵¹

NEG

‘The colonel thought it was a deception and said that they should leave because he did not need their goods.’

- (196) Aber die buecher seines Gesetzes hette er nicht mit sich
but the books his-GEN law-GEN had he NEG with him
gefuehrt/ denn dieweil er auff dem wasser were/ duerffte
carried because while he on the water was may-SBJV.PST
er jr nicht.¹⁵²
he they-GEN NEG

‘But he did not carry along the books of his laws because while he was on water he did not need them.’

- (197) von art seind sie verderbt, geneigt zu bosheit darumb dürfen
of art are they foul inclined to evil therefore may
sie freund die sie underweisen, ermanen und strafen und
they friends REL.PRN them instruct warn and punish and
von den sunden helfen¹⁵³
from the sin help

‘Their character is foul and inclined to evil, therefore they need friends that instruct, warn, punish and help them to refrain from sinning.’

- (198) da darf man wenig salz zû einer schüssel vol¹⁵⁴
there may one little salt for a bowl full

‘Little salt is needed for a entire bowl.’

151 Ulrich Schmid *Neuwe Welt*, 32a, (1567).

152 Ulrich Schmid *Neuwe Welt*, 9a, (1567).

153 Geiler von Keisersberg, *sünden des munds*, 47a (1518), as cited in the DWB.

154 Geiler von Keisersberg, *sünden des munds*, 53a (1518), as cited in the DWB.

- (199) es darf wenig uszlegens, jederman weiszt waz es
 it may little interpret-INF.NOUN-GEN everyone knows what it
 ist¹⁵⁵
 is
 ‘Not much interpretation is required as everyone knows what it is’
- (200) wir dörften wol einer leiteren, sollen wir anders im nach
 we may well a-GEN ladder-GEN shall we further him after
 steigen¹⁵⁶
 step-INF
 ‘We need a ladder if we would like to follow him.’

But crucially, these instances of *dürfen* without an infinitive complement express a meaning that is very different from the one created by *dürfen* with an infinitive complement. The transitive examples denote a need and thus reflect the original meaning of *dürfen*, as has been discussed by Fritz (1997: 10) in some detail. In contrast, *dürfen* with an infinitive is negative polar at this period and expresses a permission. As these two meanings essentially differ with respect to their modal force, it is not plausible to assume that they can be subsumed under the same lexicon entry.

Note that there is an etymologically related verb *bedürfen* ‘need’ that selects a genitive NP. It is fairly likely that all of the examples discussed above emerged due to a contamination with *bedürfen* + genitive NP. This would explain the availability of the genitive case in these instances. As for those complements in the occurrences above that are considered as accusative NPs (cf. 197–199), it is not so clear whether they indeed carry accusative case. The example (197) is in principle ambiguous, and (199) involves a quantifier that selects a genitive NP.

There is a further argument that speaks against the assumption that the examples above are archaic remnants of the transitive use of *dürfen*. During the Middle High German period, *dürfen* is not very frequent and predominantly found as a negative polar item with an infinitive complement, as has been illustrated by Bech (1951: 14). In the voluminous novels from the late 12th century, *Pârzival* and *Iwein*, *dürfen* can only be found with an infinitive complement and negation.

Note that not all of the patterns illustrated above involve genuine transitive configurations. Upon closer inspection, it turns out that *dürfen* was also possible as an impersonal verb that lacked a referential subject argument (199).

¹⁵⁵ Geiler von Keisersberg *sünden des munds*, 23a (1518), as cited in the DWB.

¹⁵⁶ Geiler von Keisersberg *sünden des munds*, 86a (1518), as cited in the DWB.

However, there are transitive uses of *dürfen* that frequently occur in processes of first language acquisition. In contrast to the examples given above, *dürfen* in (201) refers to a permission.

- (201) Darf ich ein Eis?
 may I a ice.cream
 'Am I allowed to get ice cream?'

As these uses do not belong to the grammar of the target language, they will not receive any further attention here.

Even if the examples discussed here cannot be considered as genuine transitive uses of the verb *dürfen*, such uses exist in earlier stages, as Birkmann (1987: 161) shows.

2.2.4.2 Raising infinitives with event modification

The most frequent use of *dürfen* is the one in which it selects a bare infinitive complement. In most of these cases, it denotes permission. Following the tradition established by Bech (1949: 18), authors such as Welke (1965: 105) and Öhlschläger (1989: 162) assume that permission is most efficiently defined in terms of volition. In more detail, deontic *dürfen* indicates that the embedded proposition is consistent with the wishes of another referent, the person who grants the permission. As was indicated in Section 2.2.1.3, the precise syntactic status of circumstantial modal verbs with infinitive complements is contested. Exponents of the analysis put forth by Ross (1969: 86) assume that all circumstantial modal verbs are uniformly control predicates. Likewise, Welke (1965: 107) argues that deontic *dürfen* is a two-place predicate. In contrast, the alternative view is based on the assumption that circumstantial modal verbs can be raising verbs as well.

As Öhlschläger (1989: 105) argues, the permissive uses of *dürfen* involve a raising structure. Applying the diagnostics for raising introduced in Section 2.2.1.3, it turns out that *dürfen* is indeed documented in environments that are only compatible with raising verbs. First of all, it can select non-referential subjects (cf. 202–205). Apart from that, the possibility operator contained in *dürfen* can take scope over existentially quantifying subject NPs yielding a *de dicto*-interpretation (cf. 206–207), which, according to Stechow (2003: 203), indicates raising. In both examples, the permission is not tied to an previously identified referent.

- (202) Es darf nicht nur ums Sparen gehen.¹⁵⁷
 it is.allowed.to NEG about saving go-INF
 'It should not just be about saving money.'

¹⁵⁷ DeReKo: HAZ09/FEB.01718 Hannoversche Allgemeine, 10/02/2009.

- (203) Nun ist aber alles wieder im Reinen, und es darf
 now is but everything again in.the pure and it is.allowed.to
 gefeiert werden.¹⁵⁸
 celebrate-PPP PASS.AUX-INF
 ‘Now that everything has been sorted out, we are again allowed to celebrate.’
- (204) In Deutschland wohnt die Freiheit. Hier darf geraucht
 in Germany lives the freedom here may smoke-PPP
 werden.¹⁵⁹
 PASS.AUX-INF
 ‘Freedom lives in Germany. Here, smoking is allowed.’
- (205) Es darf kein Schweigen mehr geben – Schweigen
 it is.allowed.to no silence more give-INF silence
 bedeutet Mitschuld¹⁶⁰
 means complicity
 ‘There should not be silence any more – silence means complicity’
- (206) Einer seiner Sprösslinge darf den Kuchen
 a his-GEN chip.off.the.old.block-GEN is.allowed.to the cake
 schneiden, der andere sein Stück aussuchen.¹⁶¹
 cut-INF the other his piece choose-INF
 ‘One of his chips off the old block may cut the cake, the other one may choose his piece.’
- (207) Dabei soll jede Band versuchen, mit maximal drei Titel
 thereby shall each band try with maximally three titles
 die Jury zu überzeugen. Einer der Songs darf
 the jury to convince-INF a the-GEN song-GEN is.allowed.to
 jedoch noch nicht auf einem existierenden Tonträger sein.¹⁶²
 but yet on a existing sound.carrier be-INF
 ‘In doing so, each band should try to win over the jury presenting no more than three titles. One of the songs must have not yet been released on an existing form of audio media.’

In both examples (206) and (207), the subject NP could be replaced with a NP that contains a canonical existential quantifier: *ein Sprössling* or *ein Song*. It is not important here whether *ein* is used as an indefinite pronoun or as a numerical

159 DeReKo: RHZ07/JAN.10458 Rhein-Zeitung, 13.01.2007.

159 DeReKo: BRZ06/AUG.12221 Braunschweiger Zeitung, 25/08/2006.

160 DeReKo: A00/MAI.36865 St. Galler Tagblatt, 27/05/2000.

161 DeReKo: RHZ02/MAR.16434 Rhein-Zeitung, 23/03/2002.

162 DeReKo: O94/FEB.15123 Neue Kronen-Zeitung, 19/02/1994.

determiner, as Carpenter (1998: 87) has demonstrated that a numerical determiner behaves like an ordinary existential quantifier.

Finally, *dürfen* in its permission reading is transparent with respect to voice. If the subject position of *dürfen* was assigned a semantic role and identified as the bearer of the permission, the examples given in (208a) and (208b) would be expected to refer to a distinct state of affairs. In the first case, the permission would be granted to Reinhold and in the second case, to the mountain Nanga Parbat. However, this is not the correct interpretation of these examples.

(208) a. Der Reinhold darf den Nanga Parbat ohne
the Reinhold is.allowed.to the-ACC Nanga Parbat without
Sauerstoffgerät bezwingen.
oxygen.apparatus conquer-INF

'It is allowed that Reinhold conquers the Nanga Parbat without oxygen mask.'

b. Der Nanga Parbat darf vom Reinhold ohne
the-NOM Nanga Parbat is.allowed.to by.the Reinhold without
Sauerstoffgerät bezwungen werden.
oxygen.apparatus conquer-PPP PASS.AUX-INF

'It is allowed that the Nanga Parbat is conquered by Reinhold without oxygen mask.'

Having shown that the permissive use of *dürfen* involves a raising pattern, it is now time to take a closer look at the semantic content. How can it be captured? As Kratzer (1981: 40) suggests, all of the traditional modal verbs in German can be considered items that involve quantification over possible worlds. Kratzer (1991: 649) further argues that the interpretation of any modal expression in natural language can be captured by means of three dimensions: modal force, modal base and ordering source. The dimension that is the least difficult to identify is the modal force.

Bech (1949: 18, 38) uses almost the same semantic description for the permissive use of *dürfen* as for the possibility modal verb *können*. Furthermore, Becker (1836: 178) Kratzer (1981: 46) and Öhlschläger (1989: 158, 162) explicitly analyse deontic *darf* as a possibility modal verb. However, none of these authors provide sound empirical evidence for their conclusions.

Nevertheless, there are good reasons to adopt their analyses, which treat *dürfen* as some sort of possibility modal verb. First of all, *können* occasionally exhibits a permissive interpretation which is obviously synonymous with *dürfen*, as was indicated in Section 2.2.1.3. Moreover, Levinson (2000: 36) has pointed out that quantifying expressions such as possibility modal adverbs induce scalar im-

plicatures.¹⁶³ If a speaker utters that something is possible, this utterance will imply that it is not certain.

- (209) Possibly, there's life on Mars.
 +> *not certainly*

From this, in turn, it follows that $(\langle p \rangle \& \langle \neg p \rangle)$ should always be true in natural spoken language. Accordingly, it is expected that the conjunction of *dürfen* (p) and *dürfen* ($\neg p$) should not result in a contradiction if *dürfen* indeed carries a possibility modal operator. As it turns out, deontic *dürfen* is acceptable in such configurations without causing a contradiction, irrespective of whether it is inflected for indicative (cf. 210a) or subjunctive of the past (cf. 210b). The diacritic || indicates a intonation break and the underlined constituent bears a high pitch accent.

- (210) a. Sie darf den Anruf entgegennehmen aber sie
 she is.allowed.to the call answer-INF but she
 darf ihn genau so gut auch || nicht entgegennehmen.
 is.allow.to him exactly as well also NEG answer-INF
 'She is allowed to answer the call, but at the same time she is also allowed not to answer it.'
- b. In diesem Falle, dürfte sie den Anruf entgegennehmen
 in this case is.allowed.to she the call answer-INF
 aber sie dürfte ihn genau so gut auch || nicht
 but she is.allow.to him exactly as well also NEG
 entgegennehmen.
 answer-INF
 'In this case, she would be allowed to answer the call, but at the same time she would also be allowed not to answer it.'

As these contrasts indicate, circumstantial *dürfen* indeed turns out to be a true possibility modal verb, confirming the views held by Bech (1949: 18, 38) and Kratzer (1981: 46).

As has been observed by Öhlschläger (1989: 186) and Diewald (1999: 232), the indicative of *dürfen* lacks an epistemic interpretation. This type of interpretation can only be rendered with the subjunctive of the past form *dürfte*.

Nevertheless, there are examples of indicative *dürfen* in which the speaker appears to express an epistemic evaluation with respect to the truth of the embedded proposition, see examples (211)–(213):

163 At this point, I would like to thank Roland Schäfer and Uli Reich for inspiring comments on this diagnostic.

- (211) Das darf doch nicht wahr sein, dass der letzte grössere
 this is.allowed.to yet NEG true be-INF that the last big
 Laden im Dorf Steinach mit über 3000 Einwohnern
 shop in.the village Steinach with over 3000 inhabitants
 verschwindet.¹⁶⁴
 disappears
 'I cannot believe that it is true that the last big shop in the village Steinach is disappearing, even though over 3.000 people live there.'
- (212) Alles beginnt mit einem Blumenstrauß und einem
 everything begins with a flower.bouquet and a
 Wutanfall. Den Blumenstrauß hat Kerstin gepflückt – für ihre
 rage.attack the flower.bouquet has Kerstin collect-PPP for her
 Mama. Doch die sieht nur ungelenk abgerupfte Narzissen in der
 mum but she sees only awkwardly ripped daffodils in the
 Hand ihrer achtjährigen Tochter und fährt aus
 hand her-GEN eight.year.old-GEN daughter-sc gen and drives out
 der Haut: „Das darf ja wohl nicht wahr sein – meine
 the skin this is.allowed.to PAR maybe NEG true be-INF my
 schönsten Gartenblumen, du spinnst wohl!“¹⁶⁵
 beautiful-SUP garden.flowers you nuts.be-INF maybe
 'Everything started with a bouquet of flowers and a fit of anger. The bouquet of flowers has been collected by Kerstin – for her Mum. But she only sees awkwardly ripped daffodils in the hand of her eight year old daughter and loses her temper: "I cannot believe that this is true – the most beautiful flowers from my garden, you are nuts!"'
- (213) Der Norweger kommt trotz Aufwinds nur auf 11,5
 the Norwegian comes in.spite.of updraught-GEN only at 11,5
 Meter hinunter. Für seinen Teamkollegen Velta darf das
 meters down for his team.colleague Velta is.allowed.to that
 kein Problem sein.¹⁶⁶
 no problem be-INF
 'The Norwegian only jumped 11.5 meters, in spite of an updraught. I cannot imagine that this will be a challenge for his team mate Velta.'

However, the examples in (211) and (212) differ from well-behaved epistemic modal verbs in a crucial respect. In these cases, the speaker knows that the embedded proposition is actually true. This type of context is not compatible with epistemic operators. A similar observation regarding this use of *dürfen* has been already

¹⁶⁴ DeReKo: A10/FEB.04341 St. Galler Tagblatt, 15/02/2010.

¹⁶⁵ DeReKo: M11/MAI.06511 Mannheimer Morgen, 21/05/2011.

¹⁶⁶ www.laola1.at 04/01/2012. Live Ticker for the 4-Schanzen-tournee.

made by Fritz (1991: 46 Fn.1). The peculiarity of these examples might be due to the fact that they do not carry an animate modal goal. The speaker does not want to believe the modified proposition, he does not permit himself to believe it. In more formal terms: The embedded proposition is not consistent with the wishes of the modal source, which is identified with the speaker.

In a similar way, the interpretation of *darf* in (213) can be captured in terms of circumstantial modality. Being a well-trained ski jumper, it is not consistent with the wishes of the modal source, which is identified with the trainer. Similar abstract uses of circumstantial *dürfen* have been collected by Welke (1965: 107).

As has been noticed by Öhlschläger (1989: 185), the semantic core of circumstantial *dürfen* and epistemic *dürfte* differ considerably. For the same reason, some authors such as Wurmbrand (2001: 137, 224) consider *dürfte* an independent lexical item. Further evidence for this view will be presented in Section 2.2.5.

2.2.4.3 Raising directionals with event modification

As with the verbs that have been reviewed in the previous sections, deontic *dürfen* can be observed with verbless directional phrases. As has been pointed out by Barbiers (1995, 2002: 53) and Szumlakowski-Morodo (2006: 327), an ellipsis account particularly lacks plausibility in the cases in which the verb selects an inanimate NP. Such cases can be found with deontic *dürfen*.

- (214) Wie viel Haar darf weg? Welche Farbe soll es
 how much hair is.allowed.to away what colour should it
 sein?¹⁶⁷
 be-INF
 ‘How much hair am I allowed to cut off? What colour should it be?’
- (215) Außerdem heftete Jost einen Merktzettel dran, was in die Tonne
 moreover put Jost a reminder on.it what in the bin
 hinein darf und was nicht.¹⁶⁸
 in is.allowed.to and what NEG
 ‘Moreover, Jost put a reminder on it indicating what may be thrown in to the bin and what not.’
- (216) Einer darf noch in die WM-Abfahrt,
 a is.allowed still into the world.championship.downhill.race
 aber wer?¹⁶⁹
 but who

¹⁶⁷ DeReKo: M02/AUG.64829 Mannheimer Morgen, 31/08/2002.

¹⁶⁸ DeReKo: M98/DEZ.93655 Mannheimer Morgen, 12/12/1998.

‘Someone may still join the downhill race team for the world championship team, but who could it be?’

As the examples (214) and (215) do not contain subjects that can be identified as the bearer of a permission, they are most plausibly analysed as raising patterns. In contrast, example (216) involves a subject quantifier that takes narrow scope with respect to the modal operator, which is generally held to be a diagnostic for raising.

2.2.5 *dürfte*

As has been illustrated in the previous section, the subjunctive of the past form *dürfte* can yield an epistemic interpretation. As it turns out, this use of *dürfte* occurs in the very same contexts as the remaining epistemic modal verbs occur. Just as with any other epistemic modal verb, the epistemic use of *dürfte* can embed a predication consisting of an identified individual and a predicate that refers to a state that cannot be changed (cf. 217–219) or a predicate that refers to an event in the past (cf. 220–221). A circumstantial interpretation in which *dürfte* is interpreted as the subjunctive of the past of deontic *dürfen* ‘be allowed to’ is not available in these cases.

- (217) Das erste Bild des Babys dürfte Schätzungen von
the first picture the-GEN Baby-GEN might estimations by
Paparazzi zufolge rund fünf Millionen Dollar (vier
papparazzi according.to about five millions dollar (four
Millionen Euro) wert sein.¹⁷⁰
millions Euros) worth be-INF

‘According to estimations by paparazzi, the first picture might have a value of about five million dollars (four million euros).’

- (218) Fachleute haben inzwischen auch mit Scannern die
experts have meanwhile also with scanners the
Maße dieses neuen Hohlraumes gemessen. Er dürfte
measurements the-GEN new-GEN cavity-GEN measured he might
15 mal 13 Meter groß und 48 Meter tief sein.¹⁷¹
15 times 13 meters big and 48 meters deep be-INF

‘Meanwhile, experts have also measured the dimensions of the new cavern with scanners. It is 15 by 13 meters wide and 48 meters deep.’

169 DeReKo: K97/FEB.08651 Kleine Zeitung, 04/02/1997.

170 DeReKo: NUZ06/MAI.02995 Nürnberger Zeitung, 29/05/2006.

171 DeReKo: NON07/JUN.12389 Niederösterreichische Nachrichten, 20/06/2007.

- (219) Überhaupt hatte der Pudel, er dürfte schätzungsweise neun bis
generally had the poodle he might approximately nine to
zehn Jahre alt sein, Glück im Unglück.¹⁷²
ten years old be-INF luck in.the bad.luck
'Generally, the poodle, who is approximately nine or ten years old, was quite lucky,
given the circumstances.'
- (220) Der Mann dürfte im Schlaf gestorben sein, da die Beamten
the man might in.the sleep die-PPP be-INF as the officers
ihn im Bett gefunden hatten.¹⁷³
him in.the bed found had
'The man must have died in his sleep, as the officers had found him in his bed.'
- (221) Der Wunsch nach Ungestörtheit dürfte schließlich dem Liebespaar
the wish for privacy might finally the love.couple
auf so tragische Weise das Leben gekostet haben.¹⁷⁴
for such tragic manner the live cost-PPP have-INF
'The wish for privacy might have finally caused the death of the lovers, who died in
such a tragic manner.'

Furthermore, this use of *dürfte* is subject to the CoDeC. In all of the examples above, the speaker indicates that the modified proposition is not part of his knowledge. For instance, the author of example (217) could not resume the discourse with an utterance such as '...and indeed, a newspaper has paid 4.8 million dollars for that picture.'

It is no trivial matter to identify the precise semantic specification of this use. Some authors conclude that *dürfte* equals the epistemic uses of *können*: Bech (1949: 20, 38) assumes that epistemic *dürfte* has the same modal force as epistemic *können*, and Lötscher (1991: 353) argues that epistemic *dürfte* has the same meaning as epistemic *könnte*.

In contrast, Welke (1965: 107) observes that *dürfte* cannot be analysed compositionally. According to him, it behaves similarly to the epistemic use of *können*, but it expresses a higher degree of certainty. This perspective has been adopted by Raynaud (1977: 23), Weinrich (1993: 312), Zifonun (1997: 1910), Öhlschläger (1989: 195, 258) and Helbig and Buscha (2001: 121), who argue that epistemic *dürfte* expresses a probability. Likewise, Kratzer (1981: 58) notices that epistemic *dürfte* is hard to gloss. According to her, the most promising translation is *it is*

172 DeReKo: RHZ06/OKT.11580 Rhein-Zeitung, 13/10/2006; Pudel einfach über den Zaun geworfen

173 DeReKo: BVZ09/OKT.01155 Burgenländische Volkszeitung, 14/10/2009.

174 DeReKo: NON09/JAN.04467 Niederösterreichische Nachrichten, 12/01/2009.

probable that. In subsequent work, Kratzer (1991: 650) classifies *dürfte* as a weak necessity modal verb. In a similar manner, Becker (1836: 180) and Schoetensack (1856: 297) observed already that epistemic *dürfte* expresses a logical probability. Both of them assume that this interpretation has been derived from morphologically similar preterite present *turren* ‘dare’. Furthermore, they conclude that the speaker’s evaluation is dependent on the volition of another agent. Similarly, Curme (1922: 319) argues that *dürfte* is used to state that the speaker is pretty sure about the validity of the embedded proposition. Finally, Vater (1975: 112) notices that epistemic *dürfte* always involves a weaker type of modal force than epistemic *werden*.

As none of these authors provides sound empirical evidence for their classifications, the semantic behaviour of *dürfte* will receive closer attention in the remainder of this section. As was shown in the preceding section, there are a couple of diagnostics that apply to well-behaved possibility modal verbs. Firstly, departing from the hypothesis advocated by Levinson (2000: 36), according to which epistemic possibility operators induce scalar implicatures, Papafragou (2006: 1693) and Kotin (2008: 382) argue that a canonical epistemic possibility operator should not cause a contradiction in a configuration in which the possibility operator is conjoined with the possibility operator that selects the negated proposition such as: ($\diamond p$) & ($\diamond \neg p$). And indeed, the epistemic possibility verbs *kann* and *könnte* are acceptable in this type of configuration, as is illustrated in examples (222a)–(222b). However, epistemic *dürfte* yields a contradiction in such contexts (cf. 222c):

- (222) a. Anatol kann den Brief gelesen haben, aber er kann ihn
 Anatol can the letter read-PPP have-INF but he can it
 genauso gut auch || nicht gelesen haben.
 exactly.as well also NEG read-PPP have-INF
 ‘It could be that Anatol has read the letter, but it could also be that he has not read it.’
- b. Anatol könnte den Brief gelesen haben, aber er
 Anatol can-SBJV.PST the letter read-PPP have-INF but he
 könnte ihn genauso gut auch || nicht gelesen haben.
 can-SBJV.PST it exactly.as well also NEG read-PPP have-INF
 ‘It could be that Anatol has read the letter but it could also be that he has not read it.’
- c. # Anatol dürfte den Brief gelesen haben, aber er
 Anatol may-SBJV.PST the letter read-PPP have-INF but he
 dürfte ihn genauso gut auch || nicht gelesen haben.
 can-SBJV.PST it exactly.as well also NEG read-PPP have-INF
 Intended reading: ‘It is more than likely that Anatol has read the letter but it is also more than likely that he has not read it.’

As it seems, the most natural prosodic pattern for these configurations is one in which the focus is on the past participle *gelesen* in the first clause, and on the negation in the second clause. The resulting set of alternatives is reminiscent of VERUM-focus. What is under debate is whether *Anatol* has read the letter or not.

Crucially, epistemic *dürfte* behaves significantly differently in these configurations from its deontic counterpart, which does not cause a contradiction.

Upon closer inspection, it turns out that *dürfte* does not trigger scalar implicatures at all under the same prosodic pattern (cf. 222c). This is in opposition to the canonical epistemic possibility modal verbs *kann* (cf. 222a) and *könnte* (cf. 222b), which behave exactly as Levinson (2000: 36) would expect.

- (223) a. Anatol kann den Brief gelesen haben, aber er muss ihn
 Anatol can the letter read-PPP have-INF but he must it
 nicht gelesen haben.
 NEG read-PPP have-INF
 ‘It could be that Anatol has read the letter but it is not certain that he has read it.’
- b. Anatol könnte den Brief gelesen haben, aber er muss
 Anatol can-SBJV.PST the letter read-PPP have-INF but he must
 ihn nicht gelesen haben.
 it NEG read-PPP have-INF
 ‘It could be that Anatol has read the letter but its not certain that he has read it..’
- c. # Anatol dürfte den Brief gelesen haben, aber er muss
 Anatol may-SBJV.PST the letter read-PPP have-INF but he must
 ihn nicht gelesen haben.
 it NEG read-PPP have-INF
 Intended reading: ‘It is more than probable that Anatol has read the letter but it need not be that he has read it.’

It appears that the acceptability of example (222c) would increase if the accent were on *dürfte*, but this does not change the fact that there is a clear contrast between the examples with *könnte* and those with *dürfte*. The reason for the incompatibility of epistemic *dürfte* remains mysterious. If it is indeed a verb that expresses a probability, the behaviour in example (222c) is unexpected. In this case, the first clause would express that the likelihood that *p* is true is higher than 0.5, and the second clause would express that the likelihood for *p* is lower than 1.0. From a merely logical perspective, this does not yield any contradiction.

The contrasts become more obvious as soon as the order of the conjuncts is changed and the focus targets the modal force of the modal operator.

- (224) a. Anatol muss den Brief nicht gelesen haben, aber er kann
 Anatol must the letter NEG read-PPP have-INF but he can
 ihn gelesen haben.
 it read-PPP have-INF
 ‘Anatol has not necessarily read the letter but it could be that he has read it.’
- b. Anatol muss den Brief nicht gelesen haben, aber er
 Anatol must the letter NEG read-PPP have-INF but he
könnte ihn gelesen haben.
 can-SBJV.PST it read-PPP have-INF
 ‘Anatol has not necessarily read the letter but it could be that he has read it.’
- c. # Anatol muss den Brief nicht gelesen haben, aber er
 Anatol must the letter NEG read-PPP have-INF but he
dürfte ihn gelesen haben.
 may-SBJV.PST it read-PPP have-INF
 Intended reading: ‘Anatol has not necessarily read the letter but it is more than
 probable that he has read it.’

All of the examples considered so far have illustrated, that *dürfte* cannot be considered a well-behaved epistemic possibility modal verb. However, if *dürfte* were a probability modal verb, as is often assumed, the contrasts in example (223) and (224) would be mysterious.

As it seems, by using *dürfte* the speaker makes a commitment that he considers the embedded proposition among a set of alternatives. But this cannot be the whole story. Obviously, it involves some additional semantic features which prevent the modal force of *dürfte* from being contrasted with epistemic *muss*. This feature may involve some evidential dimension, as is sometimes claimed, but the exact nature of this feature remains to be investigated.

Following Huitink’s (2008) findings, there are epistemic uses that can occur in the scope of a quantifying NP. As will be shown in Section 4.20, the most productive epistemic modal verbs in this configuration are the possibility modal verbs *können* and *könnte*. The universally quantifying NP can clearly bear scope over *können* (cf. 225a) and *könnte* (cf. 225b), yielding an interpretation in which the culprit could be identified with any person. Such a reading is not available with *dürfte* (cf. 225c): In this case, the narrow scope interpretation prevails, referring to an implausible state of affairs in which the culprit is everybody at the same time.

- (225) a. Dieses Schaufenster kann jeder eingeschlagen haben
 this shop.window can everybody break-PPP have-INF
 ‘Anybody could have broken this shop window.’

- b. Dieses Schaufenster könnte jeder eingeschlagen
 this shop.window can-SBJV.PST everybody break-PPP
 haben
 have-INF
 'Anybody could have broken this shop window.'
- c. # Dieses Schaufenster dürfte jeder eingeschlagen
 this shop.window may-SBJV.PST everybody break-PPP
 haben
 have-INF
 Intended reading: 'Probably everybody has broken this shop window.'

The same contrasts arise with the examples inspired by Huitink (2008), and the clauses based on the corpus examples (317) and (319):

- (226) Mindestens drei Männer können der Vater meines Kindes
 at.least three men can the father my-GEN child-GEN
 sein.
 be-INF
 'At least three different men could be the father of my child.'
- (227) # Mindestens drei Männer dürften der Vater meines Kindes
 at.least three men may the father my-GEN child-GEN
 sein.
 be-INF
 Intended reading: 'Perhaps, at least three different men are the father of my child.'
- (228) Da die Schule den ganzen Tag und teilweise auch am späteren
 as the school the whole day and partially also at later
 Abend zugänglich ist, kann jeder die Kopien mitgenommen
 evening accessible is can everyone the copies with.take-PPP
 haben.¹⁷⁵
 have-INF
 'As the school is open all day and sometimes until late in the evening, anyone could have taken the copies.'
- (229) # Da die Schule den ganzen Tag und teilweise auch am späteren
 as the school the whole day and partially also at later
 Abend zugänglich ist, dürfte jeder die Kopien mitgenommen
 evening accessible is might everyone the copies with.take-PPP
 haben.
 have-INF

175 DeReKo: A98/JUN.37190 St. Galler Tagblatt, 05/06/1998.

Intended reading: ‘As the school is open all day and sometimes until late in the evening as well, perhaps everyone has taken the copies.’

- (230) „Diesen Brief könnte jeder geschrieben haben, es geht in this letter could everyone write-PPP have-INF it goes in keine politische Richtung”, so Werner Hosiner-Gradwohl.¹⁷⁶
no political direction so Werner Hosiner-Gradwohl
‘“Anyone could have written this letter; it does not indicate any political direction”, according to Werner Hosiner-Gradwohl.’
- (231) # „Diesen Brief dürfte jeder geschrieben haben, es geht in this letter might everyone write-PPP have-INF it goes in keine politische Richtung”, so Werner Hosiner-Gradwohl.
no political direction so Werner Hosiner-Gradwohl
‘Intended reading: “Everyone could have written this letter: It does not indicate any political direction”, according to Werner Hosiner-Gradwohl.’

To conclude, epistemic *dürfte* does not behave like the prototypical epistemic possibility verbs *können* and *müssen* in a number of respects. Thus, it cannot be considered an epistemic possibility verb. It is obvious that it carries a modal force that is stronger than that. Therefore, the widespread analysis of epistemic *dürfte* as a probability modal verb is more plausible. But, as has been shown, this type of analysis does not capture the semantic behaviour in all respects. The epistemic use of *dürfte* additionally involves a semantic component that yet remains to be identified. Vater (1975: 112) claims that it always contributes an ironical resonance. Whether this is the key to the mysteries described above remains to be seen.

Considering the different uses of modal verbs, it turns out that alternations of the modal force between different uses of a particular verb hardly ever occur. The only prominent case concerns the verb *mögen* and its subjunctive of the past form *möchte*: Whereas the former is generally held to carry a modal possibility operator, the latter is by and large synonymous with the volitional verb *wollen* and therefore most plausibly analysed as necessity modal verb. Crucially, *möchte* is canonically considered an independent lexical item that has emancipated from its host lexicon entry *mögen*, as is illustrated in some detail by Öhlschläger (1989: 7), Kiss (1995: 162), Fritz (1997: 103), Diewald (1999: 144), Wurmbrand (2001: 137, 224) and Vater (2010: 103). A more detailed discussion is given in Section 2.2.8.

In a similar fashion, it is reasonable to follow Wurmbrand (2001: 137, 224), who argues that *dürfte* is an independent lexical item. If there is a common semantic core for deontic *dürfen* and epistemic *dürfte*, it must be very minor. If this is true, any account, such as Diewald (1999: 1) or Reis (2001: 287), that defines

¹⁷⁶ DeReKo: BVZ07/SEP.03009 Burgenländische Volkszeitung, 26/09/2007.

the class of modal verbs in German in terms of poly-functionality faces a great challenge. If deontic *dürfen* and epistemic *dürfte* cannot be subsumed under one lexical entry, there are suddenly two mono-functional items in the class of modal verbs.

Finally, it merits closer attention that epistemic *dürfte* occurs in a large range of environments in which most other epistemic modal verbs cannot be found, such as information-seeking question and embedded clauses, as will be seen in Chapter 4.

2.2.6 *sollen*

Beginning with Becker (1836: 181), *sollen* is considered as a modal verb that indicates external volition. In crucial respects, it very much resembles the volitional verb *wollen*. This idea has been further proliferated by Bech (1949: 11). On the one hand, its (quasi) deontic use always requires an animate source of modality. In the case of *sollen*, this volitional modal source is not realised as the subject NP, but it remains syntactically unrealised and implicit. On the other hand, *sollen* obtains a reportative interpretation just under the same conditions as *wollen* does. Moreover, it exhibits an idiosyncratic behaviour with respect to negation. Apart from this, *sollen* can yield a truly epistemic reading, as soon as it bears the subjunctive of the past morphology. Finally, *sollen* could be used as a transitive verb until the Early New High German period.

2.2.6.1 Transitive Uses

In earlier stages of German, *sollen* was used as a transitive verb that denoted a debt. The examples DWB provides the following examples from Old High German and Middle High German:

- (232) Zuene sculdigon uuarun sihuuelihemo inlihere: ein solta
two debtor were anybody-DAT lender-DAT one shall-PST
finfhunt pfenningo, ander solta finfzug.¹⁷⁷
five.hundred pennies other shall-PST fifty
'A money lender had two debtors: one of them owed him five hundred pennies, the other one fifty.'
- (233) swer im iht sol, der mac wol sorgen¹⁷⁸
whoever him something shall the may well care-INF

¹⁷⁷ Tatian 138, 9 (830).

‘Whoever owes him something might care about that.’

Contributing a highly specific semantics, it is reasonable to assume that the transitive use of *sollen* represents the source from which the subsequent necessity modal verb developed. A debt is nothing but a very specific necessity. By means of semantic bleaching, a predicate that expresses a debt can easily turn into a predicate that expresses an obligation or a more abstract necessity. According to the DWB (p. 1469), the transitive use of *sollen* has only disappeared in the course of the New High German period.

Denison (1993: 306) provides analogous examples for *shal* in Middle English. Apart from that, a similar situation can be found in French. In contemporary language use, the most canonical necessity verb *devoir* ‘must, shall’ is still occasionally used as a transitive verb that refers to a debt, as is illustrated in (234):

- (234) Je dois 51 euros à mon épicier.
I shall 51 euros to my greengrocer
‘I owe 51 euros to my greengrocer.’

Even if the transitive use of *sollen* has disappeared in Contemporary German, there are instances that could be considered as transitive-like patterns, but their usage is strictly restricted. The case under discussion here is restricted to *wh*-questions and idiomatic. Interestingly, this pattern is less acceptable with other traditional modal verbs that cannot be used as transitive verbs today, such as *dürfen* and *müssen*.

- (235) Was soll/² darf/*muss ich denn hier?¹⁷⁹
what shall/am.allowed.to/must I PAR here
‘What am I supposed to do here?’

As these uses are fairly restricted and highly idiomatic, they will not receive any further attention.

2.2.6.2 Raising infinitives with event modification

The most frequent use of *sollen* takes a bare infinitive complement and denotes a volition that is attributed to a referent different from the subject referent, as

178 Walther von der Vogelweide *Frô Welt, ir sult dem wirte sagen* 100, 28 (around 1200).

179 The example with *dürfen* gets slightly more acceptable if the particles *überhaupt noch* ‘at.all’ are added. However, *müssen* remains ungrammatical under the same conditions:

- (1) Was darf/*muss ich denn hier überhaupt noch?
what am.allowed.to/must I PAR here at.all still
‘What am I allowed to do here at all?’

has already been indicated by Bech (1949: 11), Raynaud (1977: 14), Glas (1984: 45), Öhlschläger (1989: 174) and Fritz (1997: 17). In terms of meaning, *sollen* is very close to the obligation reading of *müssen*. It is thus reasonable to consider both elements as deontic modal verbs. The major difference concerns the specification of the modal source, which is less restrictive in the case of *müssen* and always confined to an animate agent, who is usually identified in the prior discourse. Authors such as Höhle (1978: 87) suggest that *sollen* even contributes an implicit argument for this bearer of volition. Other more idiosyncratic uses of circumstantial *sollen* are discussed by Welke (1965: 98), Bech (1949: 13–18) and Glas (1984).

Hinterwimmer (2014) points out that the semantics of *sollen* is even more specific: it does not only presuppose a volitional agent but the proposition which contains *sollen* asserts the existence of an intentional act. This intentional act involves a bearer of the volition which is distinct from the subject referent and a speech act in which that bearer of expresses a wish.

This is reflected by the fact that *sollen* behaves differently from imperatives in a crucial aspect. Whereas imperatives can be used to directly refer to an addressee (236), *sollen* with a 2nd person subject cannot (237).

(236) Geh jetzt!
go-IMP now
'Go now!'

(237) # Du sollst jetzt gehen!
you shall now go-INF
'You shall go now!/I want you to go now!'

(237) can only felicitously be uttered if it is settled in the common ground between the speaker and the addressee that the speaker wants the addressee to leave, such as a previous utterance of an imperative like (236). This restriction is reminiscent of the English semi-modal *have* with *to*-infinitive. As observed by Perkins (1983: 60) the modal source for *have to* cannot be the speaker.

It seems that Hinterwimmer's observation is rooted in the semantics of *wollen* (cf. Section (2.2.3)). Moreover it is reflected by the semantics of reportative *sollen* and, to some extent, by the semantics of epistemic *sollte*. The requirement of an intentional act prior to utterance time could also be due to the original meaning of *sollen* which used to refer to a state of being indebted.

With respect to its argument structure, the precise nature of circumstantial *sollen* is contested just as most circumstantial modal verbs are. On the one hand, there are authors such as Welke (1965: 87) and Abraham (2002: 38), who explicitly assume that circumstantial *sollen* carries a referential subject argument of its own that identifies the person on which the obligation is imposed. On the other hand,

other authors, such as Öhlschläger (1989: 105) and Wurmbrand (2001: 187–204), provide evidence that *sollen* involves a raising pattern.

Applying the diagnostics presented in the previous sections, it turns out that circumstantial *sollen* is indeed a raising verb: It occurs with non-referential subjects (cf. 238–239) and it permits de dicto interpretations of quantifiers in subject position, in which the modal operator bears scope over the quantifier (cf. 240–241). At this point, it is not important whether *ein* is used as an indefinite pronoun or as a numerical determiner, as Carpenter (1998: 87) has illustrated that numerical determiners behave in the same manner as ordinary existential quantifiers.

- (238) Die Zielsetzung ist für beide Teams klar: Es soll gepunktet
the goal is for both teams clear: it shall score-PPP
werden.¹⁸⁰
PASS.AUX-INF
'The goal is evident for both teams: They are supposed to score.'
- (239) Auch in Salzgitter forderten gestern viele Menschen, dass es
also in Salzgitter demand yesterday many people that it
nie wieder Krieg geben soll.¹⁸¹
never again war give-INF shall
'In Salzgitter, many people also demanded that there should not be any war any more.'
- (240) Ein Kandidat „von außen“ soll das Gerangel um die
a candidate from outside shall the bully around the
Chefredakteursfunktion im ORF-Landesstudio
chef.editor.function in.the ORF-regional.television.studio
beenden.¹⁸²
terminate-INF
'A candidate from outside shall terminate the bully around the position of the chief editor in the regional television of the ORF.'
- (241) „Ein Beamter von dort soll die Reichenau verstärken“,
an officer from there shall the Reichenau reinforce-INF
fordert Strigl.¹⁸³
demanded Strigl
'“An officer from down there shall reinforce the department in Reichenau”, demanded Strigl'

180 DeReKo: BVZ11/MAI.00930 Burgenländische Volkszeitung, 12/05/2011.

181 DeReKo: BRZ08/SEP.01065 Braunschweiger Zeitung, 02/09/2008.

182 DeReKo: K99/SEP.67351 Kleine Zeitung, 09/09/1999.

183 DeReKo: I97/JUL.27921 Tiroler Tageszeitung, 19/07/1997.

In a similar way, circumstantial *sollen* turns out to be transparent with respect to voice. If *sollen* were a control verb, the obligation should be expected to always be imposed on the subject argument. Accordingly, the bearer of the obligation should be Reinhold in (242a) and the Nanga Parbat in (242b). As the latter is a mountain and therefore no licit bearer of obligation, this interpretation is not plausible for the examples in (242). Instead, both examples refer to the same state of affairs, they only differ with respect to their information structure. The bearer of obligation is not identified by the assignment of a semantic role.

- (242) a. Der Reinhold soll den Nanga Parbat ohne
the Reinhold shall the-ACC Nanga Parbat without
Sauerstoffgerät bezwingen.
oxygen.apparatus conquer
'It is allowed that Reinhold conquers the Nanga Parbat without oxygen mask.'
- b. Der Nanga Parbat soll vom Reinhold ohne
the-NOM Nanga Parbat shall by.the Reinhold without
Sauerstoffgerät bezwungen werden.
oxygen.apparatus conquer-PRT.PAS PAS.AUX.PST
'It is allowed that the Nanga Parbat is conquered by Reinhold without oxygen mask.'

As has been noticed by Bech (1951: 8), Öhlschläger (1989: 91), Fritz (1997: 55), Zifonun (1997: 1903) and Ehrich (2001: 162), circumstantial *sollen* exhibits a peculiar behaviour with respect to the scope of negation. These authors argue that circumstantial *sollen* seems to prefer a narrow scope interpretation whilst all of the remaining traditional circumstantial modal verbs prefer a wide scope interpretation. Assuming that *sollen* expresses an obligation, the canonical interpretation of the negation in cases such as (243) is as follows: 'it is mandatory not to commit adultery', rather than 'it is not mandatory to commit adultery'. As already pointed out in Section 2.2.4.2, the diacritic || indicates a intonation break and the underlined constituent bears a high pitch accent.

- (243) Du sollst nicht ehebrechen.
you shall NEG commit.adultery-INF
'Thou shalt not commit adultery.'
- (244) Lola soll ihre Mutter nicht ärgern.
Lola shall her mother NEG annoy-INF
'Lola shall not annoy her mother.'
- (245) Sie darf ihre Mutter auch || nicht ärgern.
Lola is.allowed.to her mother also NEG annoy-INF
'Alternatively, Lola is also allowed not to annoy her mother.'

- (246) Sie soll ihre Mutter || nicht ärgern.
 Lola shall her mother NEG annoy-INF
 ‘What Lola shall do is not to annoy her mother.’
- (247) Nicht anrufen soll man auch nicht¹⁸⁴
 NEG call shall one also NEG
 ‘What you should not do either, is not to call.’

However, upon closer inspection, the situation turns out to be much more complicated. Even if it is more plausible to interpret the negation in (243) and (244) with a narrow scope relative to *sollen*, there are a whole range of aspects that would remain unaccounted for with such a perspective.

Firstly, a narrow scope interpretation of a negation that is combined with a circumstantial modal verb only becomes available in German under a marked prosodic pattern, as has been pointed out by Blühdorn (2012: Sect. 8.5). The negative particle requires a high pitch accent and needs to be set off by an intonational break, as is demonstrated in example (245). This prosodic pattern induces a contrast focus on the negation. The resulting set of alternatives is {‘it is allowed that Lola annoys her mother’, ‘it is allowed that Lola does not annoy her mother’}. Contrasting the negation, the configuration in example (245) presupposes that one of the discourse participants suggested to add the positive proposition ‘it is allowed that Lola annoys her mother’ to the common ground. Some sort of VERUM focus is at work. This is the only way how a negation can occur in the scope of a circumstantial modal verb in German. If the speaker has the choice to utter the logically equivalent alternatives ‘Lola darf ihre Mutter nicht ärgern’ and ‘Lola muss ihre Mutter nicht ärgern’, he would, in most cases, choose the latter one, as it does not impose as many contextual restrictions as the former one.

Turning to the most typical cases of *sollen*, occurring with negation, such as in examples (243)–(244), it becomes clear that they behave differently. On the one hand, these patterns involve an unmarked intonation in which the negative particle does not receive a contrastive focus stress. On the other hand, these sentences can be uttered even if the positive proposition such as ‘Lola soll ihre Mutter ärgern’ has not been added to the prior discourse. In order to obtain this effect, the negative particle requires being stressed, as in example (246).

The canonical case of *sollen* with negation exhibits striking similarities to the remaining circumstantial modal verbs which occur in the scope of the negation in the unmarked case. This is on par with the observation made by Öhlschläger (1989: 91), who noticed that *sollen* can occur with two negative particles (cf. 247).

184 As quoted in Öhlschläger (1989: 91).

From this it follows that *sollen* should be possible with a wide scope interpretation as well.

Moreover, the negative particle can remain in the same clause as *sollen*, in a *wh*-cleft configuration in which the infinitive complement occurs in the other clause, as is illustrated in (248)–(249). As Lenz (1996: 416) argues, *wh*-clefts can be used to disambiguate the scope of the negation with respect to modal verbs, which carry different interpretations in written German otherwise. More details on this pattern are discussed in Section 4.8.

(248) Was wir aber nicht sollten, ist Bürgern vorwerfen, daß sie
 what we but NEG shall-SBJV.PST is citizen blame-INF that they
 ihre Vergangenheit nicht bewältigt hätten.¹⁸⁵
 their past NEG overcome-PPP have-SBJV.PST
 ‘What we should not do is to blame citizens for not having come to terms with their past.’

(249) Was Kunst aber nicht sollte, ist sich aus der Frage,
 what art but NEG shall-SBJV.PST is REFL out the question
 welche ästhetischen Mittel angemessen sind, einfach
 what aesthetic means appropriate are simply
 herauszulügen.¹⁸⁶
 out.to.lie-INF
 ‘What art should not do is to avoid the issue which aesthetic means are appropriate.’

How can the contradictory facts concerning the interpretation of *sollen* with respect to negation be reconciled? As for the interaction of the necessity operator and the negation, a narrow scope interpretation seems to be much more plausible. However, from a syntactic and prosodic perspective, a wide scope interpretation is the more appropriate one.

Assuming that *sollen* carries an external volition, the riddle can be solved without much further ado. Note that for the volitional verbs such as *wollen*, the difference between a wide scope interpretation of a negation and a narrow scope interpretation can be very minor: ‘I do not want that you feel bad’ versus ‘I want that you do not feel bad’. Moreover, a wide scope reading is often re-interpreted as narrow scope reading by means of an implicature (cf. ‘NEG raising’).

Likewise, it is plausible to assume that a negation that takes wide scope over *sollen* is not interpreted as a negation applied to a necessity $\neg\Box p$ or ‘it is not necessary that *p*’. Rather, it interacts with the volitional modal operator. A more appropriate translation is: ‘there is some referent to which it is attributed that

185 DeReKo: RHZ97/FEB.14043 Rhein-Zeitung, 24/02/1997.

186 DeReKo: HAZ08/NOV.04835 Hannoversche Allgemeine, 27/11/2008.

he does not want *p* to happen. In contrast, deontic *müssen* in the scope of negation could be translated as: ‘there is no referent to which it is attributed that he wants *p* to happen’. As will be demonstrated in Section 4.10, there are different options of how a negative operator can interact with modal operators. It need not always affect the entire modal operator, occasionally only some components are concerned.

2.2.6.3 Raising directionals with event modification

Just like its circumstantial relatives, *sollen* is frequently found with verbless directional phrases. As has been illustrated in Section 2.2.1, patterns with inanimate subjects provide strong evidence for an underlying raising pattern. Interestingly, *sollen* can be found more frequently in configurations without animate subjects, as compared to the necessity modal verb *müssen*.

- (250) Die „Blehdose“ am Alsteranleger Alte Rabenstraße soll
the Blehdose at.the Alster.quay Alte Rabenstraße shall
weg.¹⁸⁷
away
‘The “Blehdose” at the Alster quay Alte Rabenstraße shall disappear.’
- (251) Nicht selten fällt dann aber der Entscheid: das Rad muss weg, ein
NEG rarely falls then but the decision the bike must away a
neues, moderneres soll her.¹⁸⁸
new modern-COMP shall here
‘In much cases, the decision is: The bike has to be scrapped, a new one has to be acquired.’
- (252) Der Dreck der vergangenen Monate soll weg, die
the dirt the-GEN past-GEN month-GEN shall away the
Frühlingssonne durch klare, streifenfreie Scheiben scheinen.¹⁸⁹
spring.sun through clear stain.less windows shine-INF
‘The dirt of the past months has to disappear and the spring sun should shine through clear and stainless windows.’
- (253) dieses Stück Demokratie soll nicht weg¹⁹⁰
this piece democracy shall NEG away
‘This piece of democracy should not disappear.’

187 DeReKo: HMP05/APR.00259 Hamburger Morgenpost, 16/04/2005.

188 DeReKo: A01/MAR.12763 St. Galler Tagblatt, 30/03/2001.

189 DeReKo: BRZ07/MAR.20931 Braunschweiger Zeitung, 13/03/2007.

190 DeReKo: Hannoversche Allgemeine, 01/10/2007.

Some of these examples reveal interesting patterns. The instance of *sollen* in (253) occurs next to a negation. A theory that assumes that the negation always takes narrow scope with respect to *sollen* would have to account for the precise nature of the element over which it bears scope in the example given above. In example (252), the verbless directional phrase occurs in coordination with an infinitive complement. Following a common assumption, the two conjuncts of a coordination have to be of the same category or ‘rank’, cf. Dougherty (1970: 850, 864), Jackendoff (1977: 51), Gazdar (1981: 157, 173), Schachter (1984: 269) or Pollard and Sag (1994: 202) for discussion. This could be interpreted as a hint that the verbless directional phrase contains a phonologically empty infinitive. But alternatively, one could argue that what is conjoined in (252) are two predicates.

In earlier stages of German, *sollen* could even select a non-referential subject in configurations with verbless directional phrases, as examples (254)–(255), taken from the DWB, illustrate.

- (254) angesehen, wie gar ein geringes leiden es ist, wenn es
 considered how INTN a small suffering it is if EXPL
 gleich zum tode oder sterben sollt.¹⁹¹
 directly to death or die-INF shall
 ‘Considering the fact of how little you suffer if you are about to die.’
- (255) nun soll es gerade auf Inspruck¹⁹²
 now shall EXPL straight to Innsbruck
 ‘Now, they want us to go straight to Innsbruck’

But it is important to stress that these instances are not acceptable in contemporary Standard German.

2.2.6.4 Raising infinitives with clause modification: reportative

Just like *wollen*, *sollen* can refer to a claim. This has been already observed by Becker (1836: 181), Schoetensack (1856: 295), Curme (1922: 322) and Bech (1949: 13). As pointed out above, circumstantial *sollen* can be semantically derived from circumstantial/volitional *wollen*, as it expresses volition that is attributed to a referent different from the subject referent. In the same manner, reportative *sollen* can be derived from reportative *wollen* referring to a claim that is attributed to a referent different from the subject referent. This has already explicitly been suggested by Schoetensack (1856: 295), who argues that reportative *sollen* involves a kind

¹⁹¹ Luther, br 4, 257 (ca. 1530) as it is quoted by the DWB.

¹⁹² Goethe XXVII, 11; (ca. 1800), as it is quoted by the DWB.

of ellipsis as well: “dieser Mensch soll gesagt haben – jemand, irgendein Fremder verlangt, dass man glaube, dieser Mensch habe gesagt” (‘Somebody wants (that one believes) that this person has said ...’). Regarding the argument structure of *sollen*, the analysis suggested by Welke (1965: 97) is without opposition; reportative *sollen* is generally held to be a one-place predicate. Likewise, Bech (1949: 13) has already observed that canonical volitional *sollen* targets the “realisation” of the embedded predication. The uses above however target the “reality” of the embedded predication. This contrast corresponds exactly to the one between circumstantial interpretations of *können* or *müssen* and their epistemic counterparts. Moreover Hinterwimmer (2014) showed that *sollen* asserts the existence of an intentional act in the commonground. In the case of reportative *sollen* this intentional act is interpreted as a claim.

Once again, these observations are in line with Truckenbrodt’s (2006: 263–268) assumption, according to which any sentential speech act type carries a volitional element which is associated with the speaker. In uttering an assertion, the speaker expresses that he wants the addressee to add the proposition to the Common Ground. Being a volitional verb, reportative *sollen* expresses this volitional component of declarative clauses and associates it with a contextually given referent referent, which is different from the speaker.

Similarly to *wollen*, *sollen* exhibits a behaviour parallel to epistemic modal verbs in a crucial respect. Whenever *sollen* embeds a predication consisting of an identified individual and a predicate that refers to a state that cannot be changed (cf. 256–257), or a predicate that refers to an event in the past (cf. 258–263), a circumstantial interpretation is excluded. The only reading available is the reportative one:

- (256) Tom Cruise und Katie Holmes sind geschockt. L. R. Hubbard (kl.
Tom Cruise and Katie Holmes are shocked L R Hubbard small
F.) soll Suris Vater sein.¹⁹³
picture shall Suri-GEN father be-INF
‘Tom Cruise and Katie Holmes are shocked. L. R. Hubbard is claimed to be Suri’s
father.’
- (257) So soll das Kokain einen Reinheitsgehalt von 80 bis 90 Prozent
so shall the cocaine a purity.degree of 80 to 90 percent
besitzen und ca. 40 Millionen Euro wert sein.¹⁹⁴
have and about 40 million Euro worth be-INF

193 DeReKo: HMP08/JAN.00616 Hamburger Morgenpost, 08/01/2008.

‘According to this, the cocaine is claimed to have a purity degree of around 80 or 90 percent and worth about 40 million Euro.’

- (258) Horst Seehofers Ex-Geliebte Anette Fröhlich (35) soll den Horst Seehofer-GEN ex-lover Anette Fröhlich 35 shall the CSU-Chef laut „Bunte” zuletzt in Berlin „regelmäßig und CSU-head according.to Bunte recently in Berlin regularly and lange” besucht haben.¹⁹⁵
long visit-PPP have-INF

‘According to the “Bunte”, Horst Seehofer’s ex-lover Anette Fröhlich is claimed to have recently visited the CSU head in Berlin frequently and for long periods.’

- (259) Während eines Gottesdienstes soll sie sich einmal an seinem during a church.service shall she REFL once on his Messgewand festgekrallt haben. Im Beichtstuhl soll liturgical.vestment cling-PPP have-INF in.the confessional shall es sogar zu einem „Annäherungsversuch” gekommen sein.¹⁹⁶
it even to a advance come-PPP be-INF

‘During a church service she is claimed to have clinged to his liturgical vestment. She is said to have made an advance in the confessional.’

- (260) Im Sommer 2008 soll Kaczynski auf dem Flug in das von in summer 2008 shall Kaczynski on the flight to the by Russland bedrängte Georgien mit einem Wutanfall auf die Russia harried Georgia with a rage.attack on the Entscheidung des Piloten reagiert haben, aus decision the-GEN pilot react-PPP have-INF for Sicherheitsgründen im benachbarten Aserbaidshan zu landen. security.reasons in neighbouring Azerbaijan to land Später hatte er dem Piloten Feigheit vorgeworfen und soll after had he the pilot cowardice blame-PPP and shall seine Entlassung erwirkt haben.¹⁹⁷
his dismissal obtain-PPP have-INF

‘Reportedly, Kaczynski reacted during the flight to Georgia with a rage attack, having acknowledged the decision of the pilot to land in the neighbouring country Azerbaijan for security reason. It is further claimed that he accused the pilot of being a coward and has obtained his dismissal.’

194 DeReKo: NON10/FEB.11326 Niederösterreichische Nachrichten, 17/02/2010.

195 DeReKo: HMP09/JUN.01135 Hamburger Morgenpost, 14/06/2009.

196 DeReKo: A09/FEB.04884 St. Galler Tagblatt, 18/02/2009.

197 www.orf.at, accessed on 27th May 2010.

- (261) Die Schweizer Journalistin Klara Obermüller, bei der Guttenberg
The Swiss journalist Klara Obermüller, from the Guttenberg
in seiner Doktorarbeit abgeschrieben haben soll, findet dieses
in this thesis copy-PPP have-INF shall finds this
Verhalten „nicht sehr ehrenhaft und eigentlich auch nicht sehr
behavior NEG very honourable and actually also NEG very
klug”.¹⁹⁸
smart
'The Swiss journalist from whom Guttenberg copied some passages in his thesis con-
siders this behaviour "not very honourable and actually also not very smart".'
- (262) Nordwestlich von Pjöngjang sollen drei Wildgänse
northwest of Pyongyang shall three wild.goose
beobachtet worden sein, die ein Trauergeschrei von
observed-PPP PASS.AUX-PPP be-INF that a grief.howl from
sich gegeben hätten und dreimal über eine Statue
REFL give-PPP have-SBJV.PST and three.times above a statue
des verstorbenen Präsidenten geflogen seien.¹⁹⁹
the-GEN deceased-GEN president-GEN fly-PPP be-SBJV.PRS
'Reportedly, three wild geese have been observed in the northwest of Pyongyang that
were howling in grief and that were flying three times over the statue of the deceased
president.'
- (263) Der Thüringer Verfassungsschutz soll laut Medien
the Thuringian protection.of.constitution shall according Media
den Mitgliedern des Neonazi-Trios in Zwickau vor
the members the-GEN Neo-Nazi-Trio-GEN in Zwickau before
elf Jahren 2000 Mark zum Kauf gefälschter
eleven years 2000 Mark for.the purchase falsified-GEN
Pässe gegeben haben.²⁰⁰
passport-GEN give-PPP have-INF
'According to the media, the Thuringian Office for the Protection of the Constitution
has supported the members of the Neo-Nazi-Trio in Zwickau eleven years ago with
2000 Mark for the purchase of falsified passports.'

Example (262) is of particular interest, as it exhibits a remarkable interaction of a reportative modal modifier and other grammatical means to qualify a proposition as a claim that has been made by somebody other than the speaker, such as

¹⁹⁸ <http://www.orf.at/stories/2042591/2042574/>, 16th February 2011.

¹⁹⁹ <http://www.orf.at/stories/2096125/2096140/>, accessed on 22th December 2011.

²⁰⁰ <http://derstandard.at/1324170159908/Verfassungsschutz-soll-Nazi-Trio-finanziert-haben-19/12/2011>, accessed on 19th December 2011.

the subjunctive of the present *seien* ‘be-SBJV.PRS’ and the subjunctive of the past *hätten* ‘have-SBJV.PST’. On closer inspection, it turns out that this configuration involves some sort of ‘sequence of modality effect’ in analogy to the sequence of tense effect in languages such as English or French. The proposition of the superordinate clause is identified as a claim made by somebody else. According to this, the two embedded conjoined relative clauses appear to require a similar specification. For some reason, the author employs the subjunctive of the past *hätten* in the first conjunct and the subjunctive of the present *seien* in the second. If both finite verbs were specified as indicative of the present, the pattern would be significantly less acceptable.

It is important to stress that reportative *sollen* is not restricted to the modification of stative predicates, it is also documented with predicates that denote a process, such as (264).

- (264) Schnaps und Wein mit dem Konterfei Adolf Hitlers auf dem
schnapps and whine with the portrait Adolf Hitler-GEN on the
Etikett: Dafür soll ein Vorarlberger im Internet
label therefore soll a Vorarlbergian in.the Internet
werben.²⁰¹
advertise-INF

‘Reportedly, a Vorarlberger advertised schnapps and wine with a label exhibiting a portrait of Adolf Hitler on the Internet.’

Just as with reportative *wollen*, the reportative use of *sollen* is not subject to the CoDeC to the same extent as epistemic modal verbs are, as will be pointed out in more detail in Chapter 6. In opposition to epistemic modal verbs, the speaker can agree or disagree with the embedded proposition which is labelled as a claim of another referent. He may even know whether it is true or false. Similar observations have been made by Öhlschläger (1989: 235), Ehrich (2001: 157), Colomo (2011: 241), Faller (2011: 4, 2012: 289).

As has been already illustrated in Section 2.2.1, epistemic modal verbs can be characterised by means of the environments from which they are excluded. As shown by Reis (2001: 294, 296), *sollen* occurs more readily in contexts in which epistemic modal verbs are significantly less acceptable, such as questions or non-finite environments. However, reportative *sollen* turns out to be less flexible in its behaviour than reportative *wollen*. This may be due to the fact that the attitude holder is provided as an implicit argument of a raising verb in the case of *sollen*, whereas, in the case of *wollen*, the attitude holder is encoded in a more salient manner: It is realised as a subject argument.

²⁰¹ <http://vorarlberg.orf.at/news/stories/2512078/>, accessed on 6th December 2011.

Interestingly, *sollen* appears to involve a concessive resonance in some cases, just as with concessive epistemic *mögen* in Section 2.2.7.7, and with the instances of *wollen* (cf. 192–194) discussed in Section 2.2.3.8. The author of the utterance (265) makes the concession that the embedded proposition can be considered possible.

- (265) Dass Renyi bei einem Blatt arbeitet, das mit dem „Falter“
 that Renyi at a paper works that with the Falter
 vergleichbar ist und schon seit 1991, verstärkt dann ab
 comparable is and already since 1991 intensified then after
 1993, gegen „Fidesz“ kampagnisiert – soll sein, beweist aber
 1993 against Fidesz campaigns shall be-INF proves but
 eigentlich nur, dass es um die Pressefreiheit in Ungarn so
 actually only that it about the freedom.of.press in Hungary so
 schlecht nicht bestellt sein kann.²⁰²
 bad NEG tilted be-INF can

‘That Renyi works for a newspaper that could be compared to the “Falter” and that campaigns against “Fidesz” since 1991 and from 1993 onward in a more intensive manner may be right. But even if so, this just proves that the freedom of the press cannot be severely endangered in Hungary.’

Data such as (265) support the hypothesis that concessive semantics could be related to volitional meaning. All of the epistemic modal verbs that allow for a concessive interpretation *mögen*, *wollen* and *sollen* involve volitional semantics to some extent or another.

There are other Germanic languages in which reportative modal interpretations of the counterpart of *sollen* can be found, e.g. Danish *skal* (Palmer (1986: 72)) and Norwegian *skulle* (cf. Eide (2005) and Hetland and Vater (2008: 96)). Interestingly, these languages lack reportative interpretations of the counterpart of *wollen*, from which the interpretation of *sollen* is derived.

2.2.6.5 Raising infinitives with clause modification: epistemic

Apart from its reportative interpretation that refers to a claim attributed to another person, *sollen* can express an assumption made by the speaker if it bears subjunctive of the past morphology. This has been already observed by Becker (1836: 181), Bech (1949: 16), Glas (1984: 104), Öhlschläger (1989: 236 Fn. 223), Scholz (1991: 275 Fn. 114) and Fritz (1997: 107).

Whenever *sollte* selects a predicate that refers to a state that cannot be changed (cf. 266) or a predication that refers to an event in the past (cf. 267), it is

²⁰² Die Presse, 29/12/2011.

restricted to an epistemic interpretation. Once again, a circumstantial reading is not available in such configurations.

- (266) Das Software-Problem sollte aber mittlerweile behoben
 the software-problem shall-SBJ.PST but meanwhile resolve-PPP
 sein, wie SBB-Sprecher Jean-Louis Scherz sagte.²⁰³
 be-INF as SBB-spokesman Jean-Louis Scherz said
 ‘The software problem should be resolved by now, as indicated by the SBB-spokesman
 Jean Louis Scherz.’
- (267) Der jüngste Erfolg sollte auch das Nervenkostüm
 the youngest success shall-SBJ.PST also the nerve.costume
 seiner Mannschaft stabilisiert haben.²⁰⁴
 his-GEN team-GEN stabilise-PPP have-INF
 ‘The last success should have also rendered his team a bigger self assurance.’
- (268) Selbstbewusstsein sollte eigentlich auch bei der SG
 self.confidence shall-SBJ.PST actually also by the SG
 Unnertal in Massen vorhanden sein.²⁰⁵
 Unnertal in masses present be-INF
 ‘SG Unnertal should actually have plenty of self confidence.’
- (269) Denn in vierzehn Tagen sollte es mit Kälte und Frost
 since in fourteen days shall-SBJ.PST it with cold and freeze
 theoretisch vorbei sein.²⁰⁶
 theoretically over have-INF
 ‘Because, theoretically, in these fourteen days, the cold and the freeze should have
 already gone.’

Interestingly, epistemic *sollte* frequently occurs in the environment of two specific speech act adverbs: *eigentlich* ‘actually’, (cf. 268) and *theoretisch* ‘theoretically’, (cf. 269). These preferences could be helpful to identify the exact interpretation of epistemic *sollte*.

First of all, the question of what conditions cause the shift of the deictic centre deserves closer attention. Whereas reportative *sollen* identifies the deictic centre with an implicit argument, epistemic *sollen* links the deictic centre to the speaker referent. Obviously, a similar shift takes place with circumstantial *sollen*. Bearing subjunctive of the past morphology, the source of volition is more likely to be the

203 DeReKo: A09/DEZ.04148 St. Galler Tagblatt, 14/12/2009.

204 DeReKo: BRZ09/MAI.07459 Braunschweiger Zeitung, 16/05/2009.

205 DeReKo: RHZ99/AUG. 20012 Rhein-Zeitung, 28/08/1999.

206 DeReKo: O98/MAR.21556 Neue Kronen-Zeitung, 05/03/1998.

speaker in the case of *sollte*. In example (270) the referent to whom the volition is attributed is the speaker, identical to Lutz Greiner. Even if the context is changed, it is more difficult to obtain an interpretation in which the source of volition is identified with another referent.

- (270) Auch Lutz Greiner würde vor allem stören, wenn dort
 also Lutz Greiner would above all annoy if there
 etwas gebaut würde. „Man sollte nicht die ganze
 something built would one should NEG the whole
 Landschaft zubetonieren. [...]”²⁰⁷
 landscape to.concrete-INF

‘Lutz Greiner would also be annoyed if something was built there. “One should not cover the whole landscape with concrete”’

Moreover, epistemic *sollte* exhibits a semantic peculiarity. As observed by Copley (2006: 11), epistemic *should* in English is only acceptable if it refers to remote evidence. In a scenario in which the speaker sees that the lights are turned on in the guest’s house uttering the sentence (271) would not be appropriate, whereas *must* would be. Copley’s observation can neatly be extended to German epistemic *sollte*, as is illustrated in (272).

- (271) Our guests should be home by now.
 (272) Unsere Gäste sollten mittlerweile schon zuhause sein.
 Our guests should meanwhile already at.home be-INF
 ‘Our guests should be home by now.’

As Copley (2006: 5) has further pointed out, the speaker can be aware that the proposition embedded by *should* is false. Accordingly, the speaker can resume the discourse in a context as in example (271): ‘...but they aren’t’. Once again, this equally holds for *sollte* in German. A similar situation obtains for the other epistemic modal verbs that may bear subjunctive of the past morphology, *könnte* ‘can-SBJV.PST’ (cf. Section 2.2.1.5) and *müsste* ‘must-SBJV.PST’ (cf. Section 2.2.2.5). In contrast, the instances above are all subject to the CoDeC. Employing *sollte*, the speaker indicates that the embedded proposition is not part of his knowledge.

There are two essential properties of *sollte*. First, just as with the other subjunctive epistemic modal verbs *könnte* and *müsste*, *sollte* indicates that at least one of the premisses on which the conclusion is based is non-verified or even counterfactual (cf. Section 2.2.1.5 and 2.2.2.5). This is seen with the most acceptable examples, which involve an implicit antecedent of a conditional (cf. 273iii, 274i, 274ii, 275ii).

²⁰⁷ DeReKo: BRZ09/JAN.09361 Braunschweiger Zeitung, 23/01/2009.

- (273) Es sollte gerade regnen.
 it should now rain-INF
 ‘It should be raining now.’
- i. # I hear some sound of patter on the roof.
 - ii. # I see people with umbrellas coming in.
 - iii. If the weather forecast was right
 - iv. ? I saw some heavy clouds heading towards our house a couple of minutes ago.
- (274) Wir sollten in einer Stunde zuhause sein
 we should in a hour home be-INF
 ‘We should be home in an hour.’
- i. If we are going to take the next train.
 - ii. If there is not much traffic ahead of us
- (275) Sebastian sollte den Zug versäumt haben.
 Sebastian should the train miss-INF
 ‘Peter should have missed the train.’
- i. # He is not in his office.
 - ii. Unless he found his wallet which I hid on purpose.
- (276) [Es klingelt] Das sollte Zwentibold sein.
 it rings this should Zwentibold be-INF
 [The door bell rings] ‘This should be Zwentibold.’
- i. I saw him entering the staircase a minute ago.
 - ii. # I didn’t expect him. May be he left some thing here.

This indicates that epistemic *sollte* retains much of its counterfactual semantics indicated by its morphology. As the most prototypical examples of *sollte* involve an implicit conditional antecedent, one could consider epistemic *sollte* as truncated conditional. These antecedents often point at the stereotypical course of how things go. Likewise, similar antecedents can be found for the corpus examples discussed above. Example (266) could be complemented with an antecedent like *if everything went right*, examples (267) and with an antecedent like *if the players are not too unassured*, and finally (269) can be complemented with an antecedent like *if the model for the weather forecast was calculated correctly*.

The second requirement concerns the epistemic modal base or the type of premises on which the conclusion is drawn. Copley (2006: 11) pointed out that the evidence on which the epistemic judgement for *sollte* is made has to be remote evidence. Hinterwimmer’s (2014) observation according to which *sollen* asserts a previous intentional act seems to be related. Putting these two observations

together one could assume that epistemic *sollte* selects a modal base which only contains propositions which were added some critical time before Utterance Time.

This analysis is supported by the behaviour of *sollte* in the contexts illustrated in (273)–(ex:SollteZwentiboldSein). First of all, it is demonstrated here that an epistemic interpretation is only available in example (273) if all premisses on which the epistemic conclusion is based were known before Utterance Time: in a context like (273iii), example (273) is acceptable. In contexts (273i) and (273ii), where the premisses are added to the knowledge of the epistemic agent during utterance time, epistemic *sollte* is not acceptable. It is not so much what the senses (eyes, ears) report to you directly but the premisses have to be part of the episodic knowledge.

Another important characteristic of epistemic *sollte* is that the epistemic agent must have expectations that the prejacent would happen and that these expectations were already part of his episodic knowledge before utterance time, as demonstrated in (276): in the context (276ii) in which it hasn't already been an expectation before the epistemic evaluation that Zwentibold would come, epistemic *sollte* is not available.

Summing up, epistemic *sollte* seems to be the epistemic modal verb whose modal base exhibits the highest degree of episodic knowledge. It is not compatible with any visual or auditive evidence which does not convey propositional content such as written or spoken language and which is accessible at Utterance Time.

To some extent, *sollte* seems to behave in a manner parallel to *dürfte*: Both can only be interpreted in an epistemic way if they bear subjunctive morphology. Following the observations made by Bech (1949), one could argue that this could be due to the fact that both verbs involve a volitional resonance in their circumstantial interpretation. However, *sollte* and *dürfte* differ with respect to a crucial property. As has been illustrated in Section 2.2.5, epistemic *dürfte* behaves very opaquely. As a consequence, it cannot be compositionally derived from its circumstantial counterpart. Thus, it has to be considered as an independent lexical item.

Some authors, such as Diewald (1999: 202) claim that, in these instances of *sollte*, the speaker does not make an epistemic evaluation of the embedded proposition. Her conclusion is based on the evidence that *sollte* cannot be substituted with epistemic *dürfte* without affecting the interpretation of the entire sentence. It is doubtful whether the difference in the interpretation is really the right evidence to support her claim. As shown above, there are many properties of *sollte* which are much in favour of an analysis of *sollte* as an epistemic modifier and that would be left unaccounted for otherwise. It is not clear how Diewald would explain that *sollte* is subject to the CoDeC and becomes epistemic just in the same environments as all of the other remaining epistemic modal verbs.

2.2.7 mögen

As has been pointed out by Öhlschläger (1989: 176), *mögen* represents a special case in semantic respects. It involves a whole range of usages which are intricate to capture. First of all, it can be used as a transitive verb, which is the most frequent pattern. In this use it embeds finite *dass*-clauses and it licences *wenn*-clauses. Apart from that, it can be used as a volitional control verb, though in most varieties only as a negative polar item. Furthermore, a circumstantial raising pattern is hard to find for *mögen*, there are at best some highly idiosyncratic instances that could be considered raising verbs. Then, it always exhibits a concessive resonance whenever employed as an epistemic modal verb, and its “purely” epistemic possibility reading has almost been lost in the last centuries. Moreover, it has a defective morphological paradigm, as its synthetic subjunctive of the past *möchte* has emancipated and has become an independent lexical item, to be discussed in Section 2.2.8. Finally, it merits closer attention that *mögen* is by far the least frequent item among the traditional six modal verbs in contemporary spoken language, as Ruoff (1981) has pointed out and as was also shown in Section 2.1.4.

The peculiarities of *mögen* can be explained in terms of the diachronic development of the entire group of modal verbs. As has been illustrated by Bech (1951: 23), Fritz (1997: 9) and Diewald (1999: 392), *mögen* used to be the default possibility modal verb until the Early New High German period, when it came gradually to be replaced with the new possibility modal verb *können*. As a consequence, *mögen* acquired a semantic component: an emotive/volitional feature. As it seems, the uses with an infinitive erode and the more lexical uses with an accusative NP or with finite complement clauses become more important. So it would not be too surprising if *mögen* dropped out of group of modal verbs in the course of the next centuries.

2.2.7.1 Transitive uses

Among the traditional six modal verbs, *mögen* is the one with the most evident transitive use. It indicates an affection between an animate subject referent and the referent realised as the direct object in an active clause, as has been demonstrated by Becker (1836: 180), Öhlschläger (1989: 69), Diewald (1999: 192) and Eisenberg (2004: 96). Just like any other transitive verb, *mögen* can be found in passivisations, as is illustrated in (277)–(278).

- (277) Als verwöhnte Zicke wird sie später von niemandem
 as fastidious bitch PASS.AUX she later by nobody
 gemocht.²⁰⁸
 like-PPP

‘Being a fastidious bitch, she will not attract much affection later on.’

- (278) Als Schriftsteller wird er [Henry de Montherlant] von
 as writer PAS.AUX he-NOM Henry de Montherlant
 vielen nicht gemocht, weil er [...] am übersteigerten
 by many NEG like-PRT.PAS since he at overreaching
 Männlichkeitsgefühl, dem sogenannten Machismo, litt.²⁰⁹
 feeling.of.masculinity the so-called Machismo suffered
 ‘As a writer, Henry de Montherlant is not very popular because he suffered from a
 overreaching feeling of masculinity, the so-called Machismo.’

As Becker (1836: 180) has pointed out, this pattern already occurs in Luther’s works in the early 16th century. In comparison to the remaining five traditional modal verbs, *mögen* is the one that occurs most often in passives. Nevertheless, it exhibits a morphological anomaly. *Mögen* has lost its synthetic subjunctive of the past. Having developed independent semantics, its genuine form *möchte* is always construed with a volitional interpretation (cf. 280). It is not synonymous with the analytic subjunctive of the past in (cf. 281) anymore. Accordingly, the analytic pattern is the only one that is acceptable in counterfactual environments.

- (279) Chihiro mag Natto.
 Chihiro likes Natto
 ‘Chihiro likes Natto.’
- (280) # Lola möchte Natto, wenn Sie keine Katze wäre.
 Lola like-SBJV.PST Natto if she no cat be-SBJV.PST
 ‘Lola likes to have some Natto, if she was not a cat.’
- (281) Lola würde Natto mögen, wenn Sie keine Katze wäre.
 Lola would Natto like-INF if she no cat be-SBJV.PST
 ‘Lola would like Natto, if she was not a cat.’

By contrast, *möchte* cannot be interpreted as *mögen* in the scope of a counterfactual operator anymore; similar observations have been made by Lötscher (1991: 338, 354).

2.2.7.2 *dass*-clauses

Aside from its transitive use, emotive *mögen* can occur with finite *dass*-clause complements. The emotive use of *mögen* presupposes that the proposition expressed by the *dass*-clause is factual. Interestingly, the majority of occurrences of emotive

208 DeReKo: M06/FEB.15690 Mannheimer Morgen, 24/02/2006.

209 DeReKo: O97/APR.41025 Neue Kronen-Zeitung, 20/04/1997.

mögen found in the DeReKo corpus originates from newspapers from West Central and North Western regions.²¹⁰ There are almost no instances from Switzerland or Austria. As most of the occurrences involve 1st person subjects, it can be concluded that this pattern is primarily characteristic of the spoken language, as is illustrated in (282). However, there are rare cases in which the subject bears the feature 3rd person, as in (283). The situation for emotive *mögen* in the scope of negation is similar. Cases with 3rd person subjects, which are exemplified in examples (284)–(285) are rather rare.

- (282) Ich mag, dass im Frühling alles blüht.²¹¹
 I like that in.the Spring everything blossoms
 ‘I like the fact that in Spring everything is blossoming.’
- (283) Monika Pohl und Susanne Schnaidt mögen, dass Schmuckstücke
 Monika Pohl and Susanne Schnaidt like that trinkets
 flexibel sind, wie die Ohrhänger aus unbehandeltem,
 flexible are like the earring of untreated
 gewachsenen Türkis, die auch als Kreolen getragen
 grown Turkey.stone REL.PRN also as Creoles wear-PPP
 werden können.²¹²
 PASS.AUX-INF can
 ‘Monika Pohl and Susanne Schnaidt like the fact that trinkets are flexible such as the earring made out of untreated naturally grown Turkey stone which can also be worn as Creole.’
- (284) Michael Schumacher mag nicht, dass ein anderer dafür
 Michael Schumacher likes NEG that a other therefore
 bezahlt wird, so auszusehen wie er.²¹³
 pay-PPP PASS.AUX so to.outlook as he
 ‘Michael Schumacher does not like the fact that there is somebody who is paid just to look like him.’
- (285) Die Schlange war wohl ähnlich nervös wie heute, mochte
 the snake was maybe similarly nervous as today like
 nicht, dass ein Mitschüler sie am Schwanzende packte.²¹⁴
 NEG that a class.mate she at.the tail.end grasped
 ‘The snake had been obviously as nervous as it was today and did not like it that a class mate grasped it by its tail.’

²¹⁰ Survey carried out 21st May 2012.

²¹¹ DeReKo:BRZ07/JUN.01103 Braunschweiger Zeitung, 14/06/2007.

²¹² DeReKo: M08/MAI.35471 Mannheimer Morgen, 09/05/2008.

²¹³ DeReKo: N00/MAR.14463 Salzburger Nachrichten, 31/03/2000.

²¹⁴ DeReKo: BRZ06/AUG.04657 Braunschweiger Zeitung, 10/08/2006.

Crucially, in all of examples with emotive *mögen* the embedded proposition is presupposed to be factive (cf. 282–285). In order to felicitously utter example (282), it is required that everything be usually blossoming. These context conditions are very different from those of circumstantial modality. As Ziegeler (2006) has pointed out, in the most canonical case the proposition embedded by a circumstantial modal operator is not true at the Time of Utterance.

Apart from the emotive use of *mögen*, there is another one that can embed a finite *dass*-clause with a volitional interpretation. In contrast to the emotive pattern, the proposition of the embedded clause is not presupposed to be factive in the volitional interpretation. In example (286), it is not granted that Lang has yet been considered an intellectual. The counterfactual nature of the *dass*-clause in this example becomes obvious by shifting the attention to the consecutive clause: The use of the subjunctive of the past in the consecutive clause indicates that in the actual world Lang has not yet been called an intellectual.

In opposition to its emotive use, *mögen* in examples (286)–(288) aims at the realisation of the embedded predication, rather than evaluating an established fact. As can be seen, in most varieties the volitional use of *mögen* requires the presence of a negative operator in the clause. At least in Upper East German varieties, volitional *mögen* with *dass*-clauses is even found without negation, as exemplified in (288).

- (286) Lang mag nicht, dass man ihn einen Intellektuellen nennt. „Das Lang likes NEG that one him a intellectual calls that wäre eine Übertreibung, zu sehr Schublade“; wehrt er ab is-SBJV.PST a overstatement too much drawer wards he off und fordert, dass man weg kommt von der Unsitte der and demands that one away gets from the bad.habit the-GEN Show in der Politik.²¹⁵ show-GEN in the politics

‘Lang does not like that he is considered as intellectual. “This would be an overstatement, too much pigeonholing” he objects and demands that one should refrain from the bad habit of making too much show in politics.’

- (287) »Wirklich, du bist gar nicht findig, Roswitha. Und ich mag Truly you are INTN NEG resourceful Roswitha and I like nicht, daß du dich erkältest, und alles um nichts.«²¹⁶ NEG that you REFL catch.a.cold and everything for nothing.

‘Truly, you are not very resourceful, Roswitha. And I do not want that you catch a cold and all that would be for nothing.’

215 DeReKo: RHZ04/JUN.08194 Rhein-Zeitung, 08/06/2004.

216 Theodor Fontane, *Effi Briest* Chapter 21. (1896).

- (288) Verdammt, ich mag, dass du wieder in Wien bist! Komm vorbei
 Damn I like that you again in Vienna are come along
 – du bist bei uns herzlichst willkommen!!²¹⁷
 you are at us cordially welcome
 ‘I wish you were back in Vienna! Come along – you are always cordially welcome!’

As can be seen, the negative polarity of volitional *mögen* with *dass*-clause is tied to its particular volitional semantics. As will be shown in more detail below, volitional *mögen* with bare infinitive complement exhibits the same preference for negative environments.

2.2.7.3 *wenn*-clauses

Among the traditional six modal verbs, *mögen* is the only one that occurs with *wenn*-clauses. As Fabricius-Hansen (1980: 162) and Kaiaty (2010: 305) indicate, determining the syntactic status of these clauses is no trivial matter. They involve properties of both complement clauses and adverbial clauses. On the one hand, Fabricius-Hansen (1980: 164) and Kaiaty (2010: 288) illustrate that this precise type of *wenn*-clause is restricted to a particular class of matrix predicates. On the other hand, Fabricius-Hansen (1980: 163) and Kaiaty (2010: 289) show that these *wenn*-clauses require the presence of a correlate that saturates the relevant argument position of the matrix predicate in the canonical case. Being a preference predicate, emotive *mögen* is expected to occur with *wenn*-clauses, as Kaiaty (2010: 293) argues. It is indeed found in the DeReKo corpus.

- (289) ich kann nicht sagen, daß sie es nicht mochte, wenn Oskar
 I can NEG say-INF that she it-COR NEG liked if Oskar
 ihr darunter saß.²¹⁸
 her underneath sat
 ‘I cannot deny that she did not liked it when Oskar sat underneath her.’

Fabricius-Hansen (1980: 185) and Kaiaty (2010: 305) argue that the type of *wenn*-clause under discussion has to be considered an adverbial clause. The position of the theme argument provided by *mögen* is typically saturated by the correlate *es*, as in example (289). The function of the *wenn*-clause, in turn, is to make the state of affairs the correlate relates to explicit.

However, there are also instances of *mögen* with *wenn*-clauses that do not overtly select a correlate, cf. (290) and (291).

²¹⁷ de-de.facebook.com/MeinOlliSchulz/posts/10150584251049316, accessed on 21st May 2012.

²¹⁸ DeReKo: MK1/LGB.00000 Grass, Günter: Die Blechtrommel, (1962).

- (290) Menotti hat nie gemocht, wenn einer hohe Flanken
 Menotti had never liked when someone high crosses
 schlug.²¹⁹
 made
 'Menotti never liked it when someone played high crosses.'
- (291) Er mag, wenn es einem scheinbar Schwachen gelingt, sich
 he likes when it a putatively weak.one manages refl
 gegen Stärkere durchzusetzen.²²⁰
 against stronger prevail
 'He likes it when a putatively weak person manages to prevail against a stronger one.'

Essentially, there is one major difference between *wenn*-clauses and *dass*-clauses that are embedded under emotive *mögen*: While a *dass*-clause always refers to a factive proposition, the proposition expressed by a *wenn*-clause need not be factive, as Kaiaty (2010: 295) has pointed out. Rather, it receives a future oriented or conditional interpretation.

Under very restricted conditions, volitional verbs such as *wollen* can also select correlates that refer to a proposition which is made explicit by a *wenn*-clause.

- (292) Er will die inhaltliche Diskussion. Was er nicht will, ist,
 he wants the content-ADJ discussion what he NEG wants is
 wenn daraus sozusagen Seilschaften gebildet oder
 when out.of.it so.to.speak rope.teams form-PPP or
 Grabenkämpfe gemacht werden.²²¹
 trench.warfare make-PPP PASS.AUX-INF
 'He wants a discussion about the content. What he does not want is if this turns into insider relationships or partisanship.'

In example (292), *will* occurs in the scope of negation and it is part of a *wh*-cleft. Crucially, in all of the examples discussed above (289)–(291), *mögen* cannot be replaced with *wollen*.

2.2.7.4 Control infinitives with event modification

As has been pointed out by Welke (1965: 115), Öhlschläger (1989: 179) and Weinrich (1993: 307), *mögen* can be combined with a bare infinitive complement, yielding a volitional interpretation. Further, Bech (1949: 21), Welke (1965: 115), Weinrich (1993: 307), Diewald (1999: 288, 315–317) notice that the volitional interpretation

²¹⁹ DeReKo: E98/JUN.15928 Zürcher Tagesanzeiger, 29/06/1998.

²²⁰ DeReKo: HMP08/DEZ.00738 Hamburger Morgenpost, 08/12/2008.

²²¹ DeReKo: RHZ07/SEP.04038 Rhein-Zeitung, 05/09/2007.

seems to be restricted to environments in which *mögen* occurs in the scope of a negative operator, as examples (293)–(294) indicate. However, in some varieties it can be used without a negation, as shown in (295)–(296). The precise meaning of volitional *mögen* is difficult to capture, but it seems to be similar to the one of volitional *wollen*. In most of the examples below, *mögen* can be substituted with *wollen* without drastically affecting the overall meaning. In opposition to its volitional counterparts, volitional *mögen* with an infinitive occurs less frequently, by far, at least in written language.

- (293) Über Geld mag er nicht reden.²²²
 About money likes he NEG talk-INF
 ‘He does not want to talk about money.’
- (294) Stefan Müller, Abgeordneter aus Erlangen und einflussreicher
 Stefan Müller depute from Erlangen and influential
 Chef der Jungen Union, mag die Krise der CSU
 boss the-GEN Junge-GEN Union-GEN wants the crisis the-GEN CSU
 erst gar nicht kleinreden.²²³
 only INTN NEG play.down-INF
 ‘Stefan Müller, depute from Erlangen and influential boss of the Junge Union does not want to play down the crisis of the CSU.’
- (295) „Doch, er ist der erste Mann, mit dem ich richtig gerne
 yes he is the first man with that I truly willingly
 zusammenleben mag, eben weil wir uns Freiräume lassen“,
 together.live-INF like just because we us free.space leave
 sagt die schöne Habermann.²²⁴
 says the beautiful Habermann
 ‘Oh yes, he is the first Mann with whom I really would like to live together, just because we allow us room for ourselves.’
- (296) Zoë ist ihre kleine Cousine. „Ich mag den aber anziehen“, beharrt
 Zoë is her small cousin I like this but put.on-INF insists
 sie und schlüpft ruckzuck in das Teil.²²⁵
 she and like.a.shot in the piece
 ‘Zoë is her small cousin “But I want to put on this” she insists and slips into the piece.’

It merits closer attention that the behaviour of volitional *mögen* with an infinitive reflects the one of its volitional counterpart with *dass*-clauses: In Standard

222 DeReKo: HMP09/MAR.02623 Hamburger Morgenpost, 25/03/2009.

223 DeReKo: NUN09/JAN.01879 Nürnberger Nachrichten, 04/04/2008.

224 DeReKo: HMP09/AUG.01928 Hamburger Morgenpost, 19/08/2009.

225 DeReKo: RHZ06/NOV.17231 Rhein-Zeitung, 18/11/2006.

German, they are more readily acceptable if they occur in the scope of negation. This indicates that the negative polarity appears to be tied to the volitional semantics of *mögen*. Interestingly, negative polarity is a behaviour that occurs fairly frequently with so-called *modal verbs*. As has been shown by Fritz (1997: 54), there are at least three modal verbs in German that displayed a negative polar behaviour over the course of the last centuries. Volitional *mögen* and *brauchen*, which will be discussed in Section 2.2.9, can still be considered negative polarity items in contemporary Standard German. Moreover, Bech (1951: 14) observes that *dürfen* was a negative polarity item until the course of the 16th century. In addition to these instances, there is still a raising pattern of *wollen* that is negative polar, as is illustrated in Section 2.2.3.5.

Crucially, *mögen* with a bare infinitive complement ceased to express any type of circumstantial possibility, like it did until the Early New High German period: In Contemporary Standard German, it cannot refer to a physical ability or to a practical possibility anymore. Bech (1951: 23), Fritz (1997: 9) and Diewald (1999: 392) argue that this drastic shift in meaning was due to the rise of another possibility modal verb *können*, which was still used rather infrequently in the Middle High German period. As soon as *mögen* had acquired the volitional feature, all of the circumstantial possibility readings presumably ceased to exist.

Finally, Welke (1965: 114) has pointed out that *mögen* can be part of some idiomatic expressions, such as *leiden mögen* ‘like’.

2.2.7.5 Control directionals with event modification

Just like all of the other circumstantial modal verbs described in this section, volitional *mögen* can select verbless directional phrases, as exemplified in (297)–(298). The semantic behaviour is parallel to the one of *mögen* with a bare infinitive complement.

- (297) „Mein Sohn Julian mag nicht mehr in den Kindergarten”, sagt
 my son Julian likes NEG more in the kindergarten says
 etwa Nina Isplitzer²²⁶
 for.instance Nina Isplitzer
 ‘“My son Julian does not like to go to the kindergarten any more” says Nina Isplitzer
 for instance.’
- (298) Wer dann nicht mehr zurück in die Stadt mag: Es gibt
 who then NEG more back in the town wants it gives
 Hotelzimmer im „Eichbaum”.²²⁷
 hotel.rooms in.the Eichbaum

226 DeReKo: NON09/SEP.18165 Niederösterreichische Nachrichten, 29/09/2009.

‘Whoever does not want to return to the city, there are rooms available at the “Eichbaum” ’

Similarly to the other volitional uses of *mögen* with a bare infinitive complement and with *dass*-clause, *mögen* with a verbless directional phrase is restricted to negative polarity contexts in Standard German. In some varieties, *mögen* with a directional phrase can occur in positive environments as well though, e.g. in East Upper German.

2.2.7.6 Raising infinitives with event modification

In Contemporary German, raising patterns of *mögen* with a circumstantial interpretation appear to have died out. However, there are some archaic uses that are candidates for a raising analysis. Schoetensack (1856: 294) observes that *mögen* can refer to a volition attributed to a third party, as in is illustrated in (299).

- (299) Er möge hereinkommen.²²⁸
 he likes-SBJV.PRS enter-INF
 ‘May he enter!/I allow/want him to enter.’

Crucially, there is no thematic relation between *mögen* and its syntactic subject in example (299). Thus, *mögen* does not carry a subject argument in the example given above. Rather, *möge* expresses that the embedded proposition is consistent with the wishes of the speaker. In this respect, it is reminiscent of the raising use of *wollen* discussed in Section 2.2.3.5.

2.2.7.7 Raising infinitives with clause modification

The epistemic uses of *mögen* are fairly peculiar and very hard to analyse. Moreover, Öhlschläger (1989: 187) observes that they occur very rarely, and that they carry an interpretation that is very different from their circumstantial counterparts. As can be seen, a couple of different patterns have to be distinguished. As has been pointed out by Becker (1836: 180), Bech (1949: 23), Welke (1965: 110), Allard (1975: 88), Öhlschläger (1989: 187 Fn. 121), Fritz (1991: 48), Weinrich (1993: 314) and Diewald (1999: 236), epistemic *mögen* usually conveys a concessive resonance and behaves in a marked way.

Like all of the remaining modal verbs, *mögen* is restricted to an epistemic interpretation in two particular contexts: Whenever it embeds a predication consisting of an identified individual and a predicate that denotes a state that cannot be

²²⁷ DeReKo:HMP06/JUL.02708 Hamburger Morgenpost, 27/07/2006.

²²⁸ Example as quoted by Schoetensack (1856: 294).

changed (cf. 300–302), any circumstantial interpretation is excluded. Likewise, *mögen* can only be interpreted in an epistemic way whenever it embeds a predication that refers to an event in the past (cf. 303–306).

- (300) Mit 8 Milliarden Euro Kosten mag Nabucco teuer sein – sie
with 8 billion Euro costs may Nabucco expensive be she
wird sich bezahlt machen.²²⁹
will REFL pay-PPP make-INF
'With its costs of around 8 billion Euros, Nabucco may be expensive – nevertheless, it will pay off.'
- (301) Candye Kane mag hundert Kilo schwer sein, ist bei Gott keine
Candye Kane may hundert Kilo heavy be-INF is by God no
klassische Schönheit und spielt nostalgischen Blues. Dennoch
classical beauty and plays nostalgic blues nevertheless
verfällt man dieser Frau: Sie ist auf der Bühne, um
one addicts this woman she is on the stage in.order
musikalisch zu heilen.²³⁰
musically to heal-INF
'Candye Kane may weigh 100 kilos, she is by no means a classical beauty, and she plays nostalgic blues. Nevertheless, one addicts to this woman: she is on stage to heal with music.'
- (302) Das Mädchen mag erst drei Jahre alt sein. Doch aufmerksamer
the girl may just three years old be-INF but attentive-COMP
war wohl noch nie ein Buspassagier. Kaum wird
was maybe still never a bus.passenger as.soon.as namely
nämlich die Haltestelle »Singenberg« angesagt, da
PASS.AUX the stop Singenberg announce-PPP there
beginnt das Mädchen auch prompt zu singen: Singenberg,
begins the girl also immediately to sing-INF Singenberg,
Singenberg, Singenberg ... – angepasst der Melodie von Hänschen
Singenberg, Singenberg adapted the melody of Hänschen
klein.²³¹
klein
'The girl may be just three years old. But no passenger of the bus has ever been more attentive. As soon as the stop »Singenberg« is announced, the girls immediately starts to sing: Singenberg, Singenberg, Singenberg ... –' adapting the melody of Hänschen klein.'

229 DeReKo: NON09/JUL.05420 Niederösterreichische Nachrichten, 13/07/2009.

230 DeReKo: A07/OKT.07573 St. Galler Tagblatt, 17/10/2007.

231 DeReKo: A00/JAN.03266 St. Galler Tagblatt, 15/01/2000.

- (303) Feminismus mag in der modernen Gesellschaft wirklich
 Feminismus may in the modern society indeed
 etwas Wichtiges bewirkt haben, aber braucht man diese
 something important cause-PPP have-INF but needs one this
 Bewegung auch in der Kirche?²³²
 movement also in the church?
 ‘Even if Feminism may have caused important changes in the modern society, is it a
 necessary movement also in the church?’
- (304) Dieser Satz mag im Affekt gefallen sein, doch empfinde
 this sentence may in.the affect fall-PPP be-INF but perceive
 ich ihn als symptomatisch für unsere Zeit.²³³
 I it as symptomatic for our time
 ‘This sentence may have been uttered in the heat of the moment, nevertheless I con-
 sider it as symptomatic for our time.’
- (305) Das ist psychologisch einfach zu erklären. Diese Kreditvorlage,
 that is psychologically simply to explain this credit.approval
 so gut sie gemeint sein mag, kommt zum falschen
 so well it mean- be-INF may comes at.the false
 Zeitpunkt.²³⁴
 moment
 ‘This can be accounted for in terms of psychology. This credit approval arrives in the
 wrong moment, even if it was well meant.’
- (306) Sein Äußeres mag sich verändert haben, seinen Idealen ist
 his appearance may REFL change-PPP have-INF his ideals is
 Carlo Acquistapace treu geblieben.²³⁵
 Carlo Acquistapace loyal stay-PPP
 ‘His appearance may have changed, but as regards his ideals, Carlo Acquistapace
 remained true to them.’

The semantic contribution of concessive epistemic *mögen* is intricate. A speaker who utters a proposition *p* in the scope of a concessive epistemic *mögen* implicitly makes a whole range of statements about *p*: First of all, he indicates that there is another referent who believes *p* to be true. Secondly, the speaker himself did not believe *p* to be true. Thirdly, by uttering the sentence *mögen(p)*, he conveys that he changed his mind and considers *p* to be possible and consistent with his own

232 DeReKo: RHZ09/MAI.08761 Rhein-Zeitung, 11/05/2009.

233 DeReKo: HAZ08/AUG.05647 Hannoversche Allgemeine, 28/08/2008.

234 DeReKo: 00/AUG.51643 St. Galler Tagblatt, 04/08/2000.

235 DeReKo: RHZ09/AUG.18314 Rhein-Zeitung, 22/08/2009.

knowledge. Fourthly, the speaker stresses that the fact that *p* is possibly true is irrelevant to the surrounding discourse. At this point, it is not evident how these different aspects of the interpretation of concessive epistemic *mögen* can be described in a more systematic and principled manner.

Thus, the concessive epistemic use of *mögen* appears to make reference to an external referent to which an epistemic state is attributed. In this property, it very much resembles the quotative use of *sollen*, as well as the raising use of *wollen*, which ascribes a volition to a third referent, as was shown in Section 2.2.3.5. Interestingly, both *sollen* and *wollen* seem to occur with a concessive epistemic interpretation as well, as pointed out in the relevant sections.

It is not evident to what extent this concessive epistemic use is subject to the CoDeC. Assuming that the deictic centre is identified with the speaker, the modified proposition should not be part of the knowledge of the speaker. It is not completely ruled out that the author of the utterance in (306) is actually aware that Acquistapace's appearance has changed. Accordingly, the concessive use would drastically differ from the remaining epistemic modal verbs. For similar reasons, some authors, such as Öhlschläger (1989: 187), argue that it is questionable whether concessive *mögen* can be considered an epistemic modal at all. However, it is not entirely clear whether the speaker in example (306) is willing to fully accept that the modified proposition (*Acquistapace's appearance has changed*) is true. Certainly, this proposition is not part of the strongest conviction of the speaker. As a consequence, concessive epistemic *mögen* could act as an existential quantifier over possible worlds: There is at least one world in the modal base in which the proposition is true, and this world is a world that is not very favourable for the speaker; but it is favourable for a third party. This ranking could be expressed by an ordering source, in the manner of Kratzer (1981) and Kratzer (1991). Accordingly, concessive epistemic *mögen* could be considered as a specialised possibility verb.

Alternatively, one could apply the CoDeC to the external referent. In that case, the speaker would state that he would not attribute the modified proposition to the knowledge of the referent. Accordingly, he would claim that the external referent cannot really know that *p* is the case.

It merits closer attention that the English counterpart of *mögen* can occasionally be interpreted with a concessive epistemic interpretation. This was already observed by Leech (1971: 69), who gives the following example:

(307) She may not be pretty but at least she knows her job.²³⁶

²³⁶ Example as quoted in Leech (1971: 69).

Apart from the concessive epistemic interpretation, *mögen* occurs with an interpretation in which it conveys a more neutral stance. Welke (1965: 112), Allard (1975: 89) and Diewald (1999: 236) illustrate that it can sometimes be interpreted with a pure epistemic possibility interpretation. As Welke (1965: 112) observes in his corpus study, the concessive resonance of epistemic *mögen* is often absent from fictional texts. In these instances, it denotes a pure assumption. In the corpus composed by Allard (1975: 89), the pure possibility interpretation prevails. The frequencies of the different interpretations are as follows: 50.64 % possibility; 18.23 % concessive; 5.58 % transition between possibility and concessive interpretation – the remaining percentage covers the non-epistemic instances of *mögen*.

Once again, in certain environments, *mögen* cannot be interpreted in a circumstantial way. If it embeds a predication consisting of an identified individual and a state that cannot be changed, as shown in examples (308)–(309), *mögen* is restricted to an epistemic interpretation. Likewise, *mögen* can only be construed with an epistemic interpretation when it embeds a predication that refers to an event in the past (cf. 310). In the contexts below, the epistemic interpretation lacks the concessive resonance. Interestingly, ‘purely’ epistemic *mögen* is frequently found with the idiomatic expression *zu tun haben* ‘to have to do with, to be related to’.

- (308) Wann das Kapellchen eigentlich gebaut wurde, kann niemand
when the chapel actually built was can nobody
mehr so genau sagen, es mag an die 100 Jahre alt sein.²³⁷
more so precise tell-INF it may on the 100 years old be-INF
‘Nobody can tell anymore when the chapel has been built, it may be about 100 years old.’
- (309) Dass Mozart auf dem Programm steht, mag gewiss mit dem
that Mozart at the program stands may certainly with the
fast schon inflationär gefeierten 250. Geburtstag des
almost already inflationarily celebrated 250 birthday the-GEN
Komponisten zu tun haben.²³⁸
composer-GEN to do-INF have-INF
‘It may be certainly have something to do with Mozart’s 250th birthday, which is almost celebrated in an inflationary manner.’

237 DeReKo: RHZ09/AUG.12239 Rhein-Zeitung, 15/08/2009.

238 DeReKo: NUZ06/FEB.03098 Nürnberger Zeitung, 27/02/2006.

- (310) 10 Uhr: Die Funkerin Margarete Wolter erwachte nach
 10 o' clock the radio.operator Margarete Wolter awoke after
 totenähnlichem Schlaf am anderen Morgen – es mag so
 dead.like sleep at.the other morning it may so
 gegen zehn Uhr gewesen sein.²³⁹
 around ten o' clock be-INF be-INF

'10 o'clock: The radio operator Margarete Wolter awoke the other morning from a death-like sleep – it may have been around ten o' clock.'

The precise semantic contribution of the epistemic use of *mögen* illustrated above is not obvious: Whereas Welke (1965: 110) and Zifonun (1997: 1894, 1910) conclude that epistemic *mögen* is synonymous with epistemic *können* and thus to be treated as an epistemic possibility verb with equal rights, Fritz (1997: 94), on rather intuitive grounds, assumes that epistemic *mögen* refers to a possibility that is weaker than the one expressed by epistemic *können*.

However, a replacement test shows a different picture. In examples (308)–(310), the epistemic uses of *mag* can neither be substituted with epistemic *kann*, nor by epistemic *könnte* without affecting the interpretation. Interestingly, a replacement would decrease the degree of commitment to the truth, contradicting Fritz (1997: 94) and Zifonun (1997: 1894, 1910). Surprisingly, the most appropriate substitute would be *dürfte*, which has been identified as an epistemic modal verb that refers to an epistemic probability in Section 2.2.5. The assumption that epistemic *mögen* carry a modal force that is stronger than a possibility is further confirmed by the occurrence of the sentence adverb *gewiss* 'certain' in example (309), which is usually analysed as an epistemic necessity adverb.

It deserves to be mentioned that epistemic *mögen* behaves like *dürfte* in other respects as well. Most importantly, it cannot be classified as a well-behaved possibility modal verb, as it fails all of the relevant tests, just as has been shown with *dürfte* in Section 2.2.5.

According to Levinson (2000: 36), epistemic possibility operators induce scalar implicatures. A canonical epistemic possibility operator should thus not cause a contradiction in a configuration in which the possibility operator that takes scope over a proposition is conjoined with the possibility operator that selects the negated proposition such as: $(\diamond p) \& (\diamond \neg p)$. And indeed, the epistemic possibility verbs *kann* and *könnte* are acceptable in these patterns, see (311a)–(311b). Similar observations have been made by Papafragou (2006: 1693) and Kotin (2008: 382). In contrast, epistemic *mögen* yields a contradiction in this environment (311c):

²³⁹ DeReKo: BRZ05/OKT.19297 Braunschweiger Zeitung, 21/10/2005.

- (311) a. Anatol kann den Brief gelesen haben, aber er kann ihn
 Anatol can the letter read-PPP have-INF but he can it
 genauso gut auch || nicht gelesen haben.
 exactly.as well also NEG read-PPP have-INF
 ‘It could be that Anatol has read the letter but it could also be that he has not read it.’
- b. Anatol könnte den Brief gelesen haben, aber er
 Anatol can-SBJV.PST the letter read-PPP have-INF but he
 könnte ihn genauso gut auch || nicht gelesen haben.
 can-SBJV.PST it exactly.as well also NEG read-PPP have-INF
 ‘It could be that Anatol has read the letter but it could also be that he has not read it.’
- c. # Anatol mag den Brief gelesen haben, aber er mag ihn
 Anatol may the letter read-PPP have-INF but he may it
 genauso gut auch || nicht gelesen haben.
 exactly.as well also NEG read-PPP have-INF
 Intended reading: ‘It is possible that Anatol has read the letter but it is also more than possible that he has not read it.’

As it turns out, epistemic *mögen* does not seem to trigger scalar implicatures at all under the same prosodic pattern. For some reason, epistemic *mögen* (cf. 312c) is less acceptable in this configuration than the canonical epistemic possibility modal verbs *kann* (cf. 312a) and *könnte* (cf. 312b), which behave exactly in the way predicted by Levinson (2000: 36).

- (312) a. Anatol kann den Brief gelesen haben, aber er muss ihn
 Anatol can the letter read-PPP have-INF but he must it
 nicht gelesen haben.
 NEG read-PPP have-INF
 ‘It could be that Anatol has read the letter but it need not be that he has read it.’
- b. Anatol könnte den Brief gelesen haben, aber er muss
 Anatol can-SBJV.PST the letter read-PPP have-INF but he must
 ihn nicht gelesen haben.
 it NEG read-PPP have-INF
 ‘It could be that Anatol has read the letter but it need not be that he has read it.’
- c. # Anatol mag den Brief gelesen haben, aber er muss ihn
 Anatol may the letter read-PPP have-INF but he must it
 nicht gelesen haben.
 NEG read-PPP have-INF
 Intended reading: ‘It is possible that Anatol has read the letter but it need not be that he has read it.’

The contrasts are maintained even if the order of the conjuncts is swapped.

- (313) a. Anatol muss den Brief nicht gelesen haben, aber er kann
 Anatol must the letter NEG read-PPP have-INF but he can
 ihn gelesen haben.
 it read-PPP have-INF
 ‘It could be that Anatol has read the letter but it need not to be that he has read it.’
- b. Anatol muss den Brief nicht gelesen haben, aber er
 Anatol must the letter NEG read-PPP have-INF but he
könnte ihn gelesen haben.
 can-SBJV.PST it read-PPP have-INF
 ‘It could be that Anatol has read the letter but it need not to be that he has read it.’
- c. # Anatol muss den Brief nicht gelesen haben, aber er mag
 Anatol must the letter NEG read-PPP have-INF but he may
 ihn gelesen haben.
 it read-PPP have-INF
 ‘It is more than probable that Anatol has read the letter but it need not to be that he has read it.’

As these examples show, epistemic *mögen* cannot be considered as a well-behaved epistemic possibility modal verb anymore.

This insight is reflected in the way epistemic *mögen* interacts with quantifying NPs. In Section 4.20, it will be shown that typical epistemic possibility modal verbs such as *können* and *könnte* can occur in the scope of a universally quantifying subject NP, as is shown in (314a) and (314b). These configurations obtain an interpretation in which the culprit can be identified with any person. Such a reading is not available with *mögen* (314c): This pattern is restricted to the narrow scope interpretation, in which the culprit is everybody at the same time.

- (314) a. Dieses Schaufenster kann jeder eingeschlagen haben
 this shop.window can everybody break-PPP have-INF
 ‘Anybody could have broken this shop window.’
- b. Dieses Schaufenster könnte jeder eingeschlagen
 this shop.window can-SBJV.PST everybody break-PPP
 haben
 have-INF
 ‘Anybody could have broken this shop window.’
- c. # Dieses Schaufenster mag jeder eingeschlagen haben
 this shop.window may everybody break-PPP have-INF
 ‘Probably, everybody has broken this shop window.’

This equally holds for the examples like those provided by Huitink (2008) in (315) and the two corpus examples (317) and (319). In either case, a substitution by the epistemic modal verb *mögen* causes an interpretation that refers to a very unlikely state of affairs.

- (315) Mindestens drei Männer können der Vater meines Kindes sein.
at.least three men can the father of my child

be-INF

‘At least three men could be the father of my child.’

- (316) # Mindestens drei Männer mögen der Vater meines Kindes sein.
at.least three men may the father of my child

be-INF

Intended reading: ‘Perhaps, at least three men are the father of my child.’

- (317) Da die Schule den ganzen Tag und teilweise auch am späteren
as the school the whole day and partially also at later
Abend zugänglich ist, kann jeder die Kopien mitgenommen
evening accessible is can everyone the copies with.take-PPP
haben.²⁴⁰

have-INF

‘As the school is open during the whole day and sometimes until late in the evening, anyone could have taken the copies.’

- (318) # Da die Schule den ganzen Tag und teilweise auch am späteren
as the school the whole day and partially also at later
Abend zugänglich ist, mag jeder die Kopien mitgenommen
evening accessible is may everyone the copies with.take-PPP
haben.

have-INF

Intended reading: ‘As the school is open during the whole day and sometimes until late in the evening, everyone has perhaps taken the copies.’

- (319) „Diesen Brief könnte jeder geschrieben haben, es geht in
this letter could everyone write-PPP have-INF it goes in
keine politische Richtung”, so Werner Hosiner-Gradwohl.²⁴¹
no political direction so Werner Hosiner-Gradwohl

‘“Anyone could have written this letter, it does not indicate any political direction.”, according to Werner Hosiner-Gradwohl.’

240 DeReKo: A98/JUN.37190 St. Galler Tagblatt, 05/06/1998.

241 DeReKo: BVZ07/SEP.03009 Burgenländische Volkszeitung, 26/09/2007.

- (320) # „Diesen Brief mag jeder geschrieben haben, es geht in keine
 this letter may everyone write-PPP have-INF it goes in no
 politische Richtung”, so Werner Hosiner-Gradwohl.
 political direction so Werner Hosiner-Gradwohl
 ‘Intended reading: “Everyone could have written this letter, it does not indicate any
 political direction.”, according to Werner Hosiner-Gradwohl.’

Finally, examples in which a universally quantifying NP takes scope over epistemic *mögen* could not be found in the DeReKo corpus.²⁴²

What can be concluded from these observations? First of all, they indicate that epistemic *mögen* cannot be considered as a well-behaved possibility modal verb, similarly to epistemic *dürfte*. At this point the question arises why epistemic *mögen* behaves in a different way. On the one hand, one could assume that it is its concessive semantics that renders epistemic *mögen* unacceptable in all of the contexts that are typical of true possibility modal verbs. But as has been indicated above, epistemic *mögen* can occasionally occur with a more neutral interpretation that lacks any concessive resonance. In all of the examples above, there is nothing that suppresses that latter type of interpretation. In principle, these instances can always be interpreted with both readings. But even under the neutral epistemic interpretation, these examples do not seem to get any better. Thus, the concessive resonance does not appear to have any influence on the acceptability of epistemic *mögen* in the environments above.

But then, it could turn out that epistemic *mögen* involves a modal force that is stronger than possibility, in the case of epistemic *dürfte*. This assumption is supported by the observation that the most appropriate substitute for epistemic *mögen* is epistemic *dürfte* in a number of contexts. Furthermore, epistemic *mögen* can be combined with the sentence adverb *gewiss* ‘certain’ in (309), which is generally regarded as an adverb of epistemic necessity. Finally, it could be another semantic feature yet to be discovered that decreases the acceptability of *mögen* in the examples above. Maybe it qualifies the type of premises or evidence the epistemic conclusion is based upon, like in the case of epistemic modal verbs in the subjunctive of the past.

Summing up, it has been shown that epistemic *mögen* is very peculiar in many respects in Contemporary German. It cannot be considered as a prototypical possibility verb anymore, which is somewhat surprising, as Fritz (1997: 9) illustrated that it was the first of the traditional modal verbs that developed an epistemic in-

²⁴² The investigation of the DeReKo corpus was carried out on 22nd November 2012, exploiting the Corpus TAGGED-T based on the queries (jeder /+w3 mag) /s0 (MORPH(VRB pp) sein) and (jeder /+w3 mag) /s0 (MORPH(VRB pp) haben)

terpretation. Moreover, it was one of the most frequent modal verbs until the Early New High German period. At this point, the question arises to what extent these peculiarities already existed in earlier stages of German.

Firstly, there is good evidence that the concessive epistemic use of *mögen* is a rather late development. On the one hand, Fritz (1991: 48) has failed to find examples of it for the 16th century in his corpus. Yet, in a corpus study carried out in the course of the investigation presented here, a plausible candidate from 1537 could be identified, as example (1000) in Section 7.1 illustrates. In this period, the most typical epistemic possibility verb appears to be rather the subjunctive of the past form *moechte*. This could be an indication that epistemic concessive *mag* was not yet frequently used in this period. But then, Allard (1975: 69,70) concludes that *mögen* with concessive resonance is derived from the more neutral use. This corresponds to the scenario for *mögen* provided by Bech (1951: 23), Fritz (1997: 9) and Diewald (1999: 392), who have demonstrated that *mögen* used to be the default possibility modal verb until the Early New High German period, when it was gradually replaced by the new possibility modal verb *können*. In turn, *mögen* acquired new semantic features, and developed an emotive reading. In order to ensure the semantic integrity of the lexical entry, all of the readings of *mögen* were affected. This explains why *mögen* turned into a concessive epistemic modal verb, and why the neutral epistemic reading is about to disappear. This will be furthermore addressed in Chapter 7.

However, there is a second issue that cannot be solved that easily. It is not clear whether *mögen* occurred as a well-behaved epistemic possibility modal verb at all. It still remains to be verified whether there is any evidence that epistemic *mögen* was acceptable in the environments typical of possibility verb in any earlier stage of German.

2.2.8 *möchten*

As was illustrated in the preceding section, the morphological subjunctive of the past form of *mögen* has lost its original meaning and has emancipated from the lexical entry of its stem. Accordingly, *möchte* does not contribute any counterfactual resonance anymore, and it has developed into a volitional verb which resembles *wollen* in many respects. A similar observation can be found in Lötscher (1991: 338, 354). These facts have motivated a range of authors, such as Öhlschläger (1989: 7), Kiss (1995: 162), Fritz (1997: 103), Diewald (1999: 144), Wurmbrand (2001: 137, 183, 224) and Axel (2001: 40), to assume that *möchte* is to be seen as an independent lexical item. A similar view is held by Reis (2001: 286), but in a less explicit manner. The case of *möchte* is reminiscent of English *must*. As Curme (1931: 410) has

pointed out, it is a former subjunctive of the past form that has acquired present indicative meaning.

Nevertheless, there is no consensus to what extent *möchte* should be considered as an independent modal verb. This is partly due to the difficulties of finding a consistent definition for the so-called *modal verbs* in German, as was already shown in Section 2.1.

What reasons are there in favour of an analysis as an independent modal verb? First and foremost, the semantic interpretation of *möchte* cannot be compositionally derived from *mögen*. Rather, it acquired a meaning that is almost identical to the one of *wollen*. As Diewald (1999: 147) assumes, the only difference compared to *wollen* concerns the expectations of the subject referent. In the case of *möchte*, the subject referent does not insist that the state of affairs expressed by the infinitive will be realised, he leaves the option of giving up on his intention. In a similar vein, Welke (1965: 114) and Vater (2010: 104) observe that *möchte* sounds more formal and polite than its counterpart *wollen*. Due to its behaviour, which is almost identical to that of *wollen*, there is no plausible reason to exclude *möchte* from the group of modal verbs. If one considers *wollen* as a genuine modal verb, one has to consider *möchte* as such as well. Finally, the two volitional verbs share another striking property: both of them are not preterite-presents, but they originated in an old optative or subjunctive form and emancipated from this form.

However, there are also arguments against an approach that classifies *möchte* as a proper and independent modal verb. On the one hand, it is far from obvious to what extent *möchte* has indeed acquired a complete morphological paradigm, including non-finite and past forms. On the other hand, some authors argue that a proper modal verb has to involve an epistemic interpretation as well. Öhlschläger (1989: 8, 93) excludes *möchte* explicitly from the class of modal verbs, as he doubts that it can be interpreted in a (reportative) epistemic way. Following the same line of reasoning, Reis (2001: 310) does not appear to consider it as a clear member of that class, either.

As recent studies have revealed, however, non-finite uses of *möchten* are well documented in the spoken language, and partially in written texts. Furthermore, there are some instances of reportative *möchte* and possibly epistemic *möchte* as well. Vater (2010: 103) illustrates that *möchte* had already developed a proper infinitive of its own in the 19th century: The example (321) provided by Vater is taken from a fictional text that reflects the spoken language in Austria. Furthermore, such uses can be easily found on the Internet (322)–(323).

- (321) daß der Muckerl kein' andere will, wie dich und, selbst, wenn
 that the Muckerl no other as desires you and even if
 er eine möchten tat, mich schon af d'allerletz, das
 he a want-INF do-SBJV.PST me already on the.last that
 weißt...²⁴³
 know
 'That Muckerl desires no other one than you and even if he wanted one, I would be
 the last one, you know that.'
- (322) Wenn Sie sich bereits entschieden haben, bei uns eintreten zu
 if you REFL already decide have at us join-INF to
 möchten, sollten Sie folgenden Ablauf beachten:²⁴⁴
 want-INF should you following procedure notice-INF
 'In case you have already decided to (want to) join us, you should consider the follow-
 ing procedure.'
- (323) Ohne moralisch werten zu möchten, kann der Monotheismus
 without morally judge-INF to want-INF can the monotheism
 nicht mit dem Polytheismus verglichen werden²⁴⁵
 NEG with the polytheism compare-PPP PASS.AUX-INF
 'Without having the intention to judge in a moral way, monotheism cannot be com-
 pared to polytheism.'

Moreover, the infinitive form *möchten* can be frequently heard in spoken language by attentive listeners. Similar observations have been made by Eisenberg et al. (2005: 566).

It appears, then, that *möchte* has undergone the same development as *wollen* and the other modal verbs. It used to be a form of a particular verb that emancipated and became an independent verb on its own. Thus, they all started out with a defective morphological paradigm that lacked, in particular, non-finite forms, and forms for the past. Step by step, they developed the missing forms. Recall that Ebert et al. (1993: 413–414) have demonstrated that none of the traditional six modal verbs had developed a proper past participle until the 13th century.

Secondly, as will be shown below in Sections 2.2.8.7 and 2.2.8.8, there are a couple of instances that could be considered as reportative or possibly epistemic usages as well. This indicates that there are good arguments to analyse *möchte* along the lines of *wollen*. There are a couple of environments in which *möchte*

²⁴³ Ludwig Anzengruber, *Sternsteinhof*, p. 42, (1890)

²⁴⁴ <http://www.thw-nuernberg.de/mitmachen/> accessed on 1st December 2011.

²⁴⁵ <http://www.religionsforum-woegeichhin.de/t2163f16-Ellinai-Zurueck-zu-Goettervater-Zeus.html> accessed on 1st December 2011.

could not be found. It is not obvious why this is the case. This behaviour could be accounted for on the basis of the assumption that *möchte* is less developed, or less modal, than *wollen*. Alternatively, it could be explained in terms of frequency. Firstly, volitional *möchte* occurs far less frequently than volitional *wollen*. And all of the environments where *möchte* could not be found turn out to be environments in which *wollen* is fairly rare as well.

The volitional verb *möchte* behaves in a way almost identical to the one of *wollen*. All of the exceptional properties that had been observed for *wollen* appear to hold for *möchte* as well. There does not appear to be any spectacular behaviour that is particular to *möchte*. To avoid any unnecessary redundancy, the comments made on this matter in this section will be rather short. To understand the nature of volitional verbs such as *möchte* and *wollen* in more detail, the reader is referred to Section 2.2.3, which is devoted *wollen*.

2.2.8.1 Transitive uses

Analogous to *wollen*, it is expected that *möchte* used without infinitive should be possible as a transitive verb as well. As it has not developed a proper past participle yet, it is not possible to apply the passive test. Given these observations, it will only be shown here that instances without an infinitive complement exist. It is not possible to directly prove that these occurrences indeed involve transitive patterns; it can just be concluded from the nature of *wollen*, which is arguably the prototype for volitional *möchte*. Some authors, such as Raynaud (1977: 5) and Eisenberg (2004: 96), explicitly assume that *möchten* can occur with NP objects. Instances like (324) or (325) are frequently found in corpora.

- (324) 94,6 Prozent der Deutschen möchten eine deutlich bessere
 96,4 percent the-GEN German want a clearly better
 Kennzeichnung von gentechnisch veränderten Lebensmitteln.²⁴⁶
 labelling of genetically manipulated food
 ‘96.4 percent of the German population want a clearly better labelling of genetically
 manipulated food.’
- (325) Kinder sind am besten bei Mann und Frau aufgehoben. Eine
 children are at best at man and woman stored a
 völlige Gleichstellung möchten wir nicht.²⁴⁷
 complete equalisation want we NEG
 ‘Kids should preferably be raised by man and woman. We do not want an entirely
 equal treatment.’

246 DeReKo: HMP09/APR.01329 Hamburger Morgenpost, 16/04/2009

247 DeReKo: M09/JUL.58113 Mannheimer Morgen, 25/07/2009

In both cases, passivisation is plausible if *möchte* is replaced with *wollen*.

2.2.8.2 *dass*-clauses

A whole range of authors, e.g. Welke (1965: 114), Raynaud (1977: 6), Öhlschläger (1989: 70), Reis (2001: 304) and Vater (2010: 105), already observed that *möchte* can select finite *dass*-clauses, just as *wollen* does. Such examples frequently occur in corpora, as is exemplified in (326) and (327):

- (326) Es ist egal, was Suri machen möchte, Tom möchte, dass sie es
it is equal what Suri make-INF wants Tom wants that she it
besser kann als alle anderen.²⁴⁸
better can than all others
'No matter what Suri wants to do, Tom wants that she does it better than any one else.'
- (327) So möchten 91 Prozent der Frauen, dass ein neuer
so want 91 percent the-GEN women-GEN that a new
Verehrer ihnen bereits bei der ersten Verabredung einen Kuss
admirer them already at the first date a kiss
gibt.²⁴⁹
give
'Accordingly, 91 percent of the women want that new admirers kiss them already on their first date.'
- (328) Hier bleibt ihr bitte stehen, weil hier möchte ich nicht,
here stay you please stand because here-FOC want I NEG
dass ihr alleine rübergeht.²⁵⁰
that you alone over.go
'Here you have to stop, as I do not want you to cross the street alone here.'

The spoken example (328) provides an interesting case, as it contains an extraction of the locative adverb *hier* 'here', which bears focus across the boundary of the *dass*-clause. It is remarkable that the extracted VP-adverb *hier* 'here' bears contrastive focus accent. Accordingly, it could be considered as an instance of *A'*-movement, just as *wh*-movement. As a consequence, it is reminiscent of extractions out of *wh*-clauses, which is acceptable at least in some southern varieties of German.

248 DeReKo: HAZ09/APR.01834 Hannoversche Allgemeine, 11/04/2009.

249 DeReKo: M08/FEB.12973 Mannheimer Morgen, 19/02/2008.

250 Mother to her children, Berlin Charlottenburg 2th June. 2012.

2.2.8.3 Control infinitives with event modification

Most notably, *möchte* occurs with a bare infinitive complement displaying a volitional interpretation. Just as its volitional relative *wollen*, it is generally held to be a control verb involving a proper subject argument of its own, as demonstrated by Öhlschläger (1989: 119), Kiss (1995: 162), Diewald (1999: 140), Axel (2001: 40), Erb (2001: 78), Reis (2001: 302) and Wurmbrand (2001: 170). Such patterns are very frequently attested in corpora, cf. (329)–(330):

- (329) Kinder oder Ehepartner können nichts dagegen unternehmen,
 children or spouse can nothing against undertake-INF
 wenn ihr Verwandter seinen Körper plastinieren lassen
 if their relative his body plastinate-INF let-
 möchte²⁵¹
 wants

‘Children or spouses cannot prevent their relatives from getting plastinated if they want to become plastinated.’

- (330) Ich möchte Sprengmeister werden.²⁵²
 I want blaster become-INF
 ‘I want to become a blaster.’

Once again, *möchte* with bare infinitive is almost synonymous with its counterpart *wollen* in these examples.

2.2.8.4 Control directionals with event modification

As Szumlakowski-Morodo (2006: 330) already pointed out, *möchte* also takes verbless directional phrase complements. Patterns such as (331) and (332) can be found in the DeReKo corpus:

- (331) Die 15-Jährige möchte gern zur Polizei.²⁵³
 the 15.year.old wants gladly to.the police
 ‘The 15 year old would like to join the police.’

- (332) Ein Umzug dürfte notwendig werden, doch kaum jemand
 a relocation might necessary become-INF but hardly any
 der verbliebenen Mieter möchte raus aus dem Haus.²⁵⁴
 the-GEN remaining-GEN tenants-GEN wants out of the house

251 DeReKo: M09/JAN.02729 Mannheimer Morgen, 13/01/2009.

252 DeReKo: M06/JUL.58784 Mannheimer Morgen, 26/07/2006.

253 DeReKo: HAZ09/JAN.04281 Hannoversche Allgemeine, 27/01/2009.

‘might become possible, but hardly any of the remaining tenants want to quit the house.’

Szumlakowski-Morodo (2006) indicates that verbless directional phrases such as the ones illustrated above do not involve ellipsis of the infinitive.

2.2.8.5 Raising infinitives with event modification

As has been suggested by Wurmbrand (2001: 170), *wollen* is not the only volitional verb that can be used with weather verbs. Apart from *wollen*, *möchte* can also occur in these configurations, which are usually held to imply raising. Similarly to the case of *wollen*, a couple of different patterns have to be distinguished.

First of all, there is the negative polar raising pattern of *möchte*, as illustrated in examples (333) and (334):

- (333) Der Frosch verwandelt sich trotz Mundspray und liebevollem
the frog changes REFL despite mouth.spray and loving
Kuss nicht in den ersehnten Prinzen. Auch bei der Kröte und der
kiss NEG in the longed.for Prince also with the toad and the
Ratte möchte das Vorhaben nicht gelingen.²⁵⁵
rat wants the enterprise NEG succeed-INF

‘The frog does not change into the longed for Prince, despite a mouth spray and a tender kiss. The enterprise simply does not happen to succeed with the toad and the rat either.’

- (334) „[...]So erschöpft und kaputt ist man während einer Etappe,
so exhausted and broken is one during a stage
wenn der Anstieg einfach nicht aufhören möchte oder der
when the climb simply NEG end-INF wants or the
Schneesturm unbarmherzig tobt”, beschreibt der Hundesportler
snowstorm mercilessly blusters describes the dog.sportsman
schwache Momente auf dem Schlitten und fährt fort.²⁵⁶
weak moments on the sledge and goes on

‘“One is that much exhausted and beat-up at some a stage if the climb simply does not happen to end or the snowstorm is mercilessly blustering” the dog sledge pilot describes weak moments on the sledge and continues.’

Just like the typical cases of negative polar raising *wollen*, the utterance in (334) contains the adverb *einfach*.

²⁵⁴ DeReKo: BRZ08/OKT.15219 Braunschweiger Zeitung, 30/10/2008.

²⁵⁵ DeReKo: A00/FEB.13085 St. Galler Tagblatt, 21/02/2000.

²⁵⁶ DeReKo:NON09/FEB.10904 Niederösterreichische Nachrichten, 23/02/2009.

Apart from this usage, *möchte* occurs as a raising verb in an environment in which it is almost synonymous with the necessity modal verb *müssen*, just like the respective raising pattern of *wollen*, which has been discussed by Helbig and Buscha (2001: 121).

- (335) Da möchte das Geschriebene erst recht und lückenlos
 there wants the written yet right and completely
 entschlüsselt sein.²⁵⁷
 decode-PPP be-INF
 ‘In this case, the writings have to be even more completely decoded.’
- (336) Den Klassenerhalt als Ziel ausgegeben haben die TSG Rheingau
 the class.sustain as goal defined have the TSG Rheingau
 und der SC Rot-Weiß Rheingau II, der aber früher gesichert
 and the SC Red-White Rheingau II the but earlier assure-PPP
 sein möchte als in der vergangenen Runde.²⁵⁸
 be-INF want as in the previous round
 ‘TSG Rheingau and SC Red-White Rheingau II have defined as their goal to say in the same league, but this has to be assured earlier than in the previous playing time.’

Finally, there are rare instances of *möchte* that exhibit the old meaning of a possibility modal verb. In the example given below, *möchte* is more appropriately substituted with *könnte*, rather than *will*.

- (337) und ehe ich das Licht auslöschte, versuchte ich, ob es mir
 and before I the light out.put tried I if it me
 wohl gelingen möchte, die scharfe Spitze ein paar Zoll
 possibly succeed-INF wants the sharp point a some inch
 tief in die Brust zu senken. da dieses aber niemals gelingen
 deep in the chest to sink as this but never succeed-INF
 wollte, so lachte ich mich zuletzt selbst aus, warf alle
 want so laughed I REFL finally self out threw all
 hypochondrische Fratzen hinweg, und beschloß zu leben²⁵⁹
 hypochondriac grimaces away and decided to live
 ‘and before I put out the light, I tried if it could succeed to sink the sharp point a couple of inches deep into the chest. But, as this never happened to succeed, I laughed out loudly and threw away all of the hypochondriac grimaces and decided to live.’

257 DeReKo: A99/AUG.59080 St. Galler Tagblatt, 28/08/1999.

258 DeReKo: M09/AUG.64710 Mannheimer Morgen, 19/08/2009.

259 DeReKo: GOE/AGD.00000 Goethe: Dichtung und Wahrheit.

2.2.8.6 Raising directionals with event modification

In opposition to *wollen*, the raising pattern of *möchte* could not be found in the DeReKo corpus. However, it is not evident whether this is due to a lower degree of grammaticalisation of *möchte*, or rather to the fact that *möchte* is by far less frequent than *wollen*.

2.2.8.7 Control infinitives with clause modification

Whereas Öhlschläger (1989: 93) assumes that *möchte* cannot be interpreted in a reportative way, Vater (2010: 107) provides the interesting example (338), where *möchte* appears to exhibit a reportative interpretation. An analogous example could also be found in the DeReKO corpus (cf. 339) and in another text (cf. 340).

- (338) Niemand aus der Nachbarschaft will etwas bemerkt
nobody from the neighbourhood wants something notice-PPP
haben, keiner möchte auch nur Verdacht geschöpft haben.²⁶⁰
have-INF nobody wants also only suspicion scoop-PPP have-INF
'All of the neighbours claim that they had not noticed anything, all of them claim that they did not have any suspicion.'
- (339) Keine Bedenken gegen das neue Einkaufszentrum zu haben
no objections against the new shopping.mall to have-INF
möchte Gerda Stecker jedoch nicht gesagt haben.²⁶¹
wants Gerda Stecker yet NEG say-PPP have-INF
'Gerda Stecker claims that she has not said, she has any objections against the new shopping mall.'
- (340) Wie die Milizen im einzelnen zusammengesetzt waren, ist
if the militia in.the only composed were is
umstritten, weil keine der bekannten Gruppierungen
contested because none the-GEN known-GEN groups-GEN
dabeigewesen sein möchte.²⁶²
be.present-PPP be-INF wants
'It is contested how the militias were composed because all of the known groups claim to not have been involved.'

All of the instances of *möchte* in the examples above embed a predication that refers to a past event. Accordingly, they behave like canonical reportative modal verbs. Even if they do so, it deserves closer attention that all of them occur with

²⁶⁰ Kölner Stadtanzeiger, 30/08/2006, as quoted in Vater (2010: 107).

²⁶¹ DeReKo: V99/NOV.52643 Vorarlberger Nachrichten, 04/11/1999.

²⁶² Noam Chomsky *Offene Wunde Nahost*, translated by Michael Haupt, Europa Verlag, p. 167.

negation. As illustrated in Section 2.2.3 and 2.2.6, it is not easy to determine the scope of negation with a volitional modal verb.

Likewise, the negation behaves in a somewhat peculiar way in the examples given above that involve a negative quantifier in subject position (cf. 338 and 340). Ehrich (2001: 167) assumes that reportative modal verbs in German always bear scope over a negative operator, as such configurations provide the more plausible interpretation for reportative modals: *x claims that not (p)* rather than *x does not claim that p*. In a similar manner, Öhlschläger (1989: 93) concludes that the narrow scope interpretation for reportative modal verbs is by far the more natural one. However, he does not want to exclude configurations in which the negation takes scope over the reportative modal verb. Examples (338) and (340), in which *möchte* involves a negative subject quantifier, are essential challenges for both approaches. Being a control verb, *möchte* requires a subject referent. Accordingly, the subject NP cannot have entirely raised from the infinitival clause. Hence, there are three options for how the interpretation comes about. Firstly, one could assume that the negative subject NP has not raised at all. Accordingly, the negation should be interpreted in the subject position, and the corresponding gloss would be as shown in (341). This does not seem to be the case. Alternatively, one could argue that only the negative particle has been raised into the subject position, where it has attached to the subject NP. Given that the decomposition of the negative quantifier *niemand* ‘nobody’ and *keiner* ‘no’ results in the combination of operators $\neg\exists$ rather than $\forall\neg$, the expected translation should be as in (342). Once again, this is not the case. The most appropriate gloss is the last one (cf. 343).

- (341) # Nobody claims to have had a suspicion.
 (342) # Somebody claims not to have had any suspicion.
 (343) Everybody claims not to have had any suspicion.

Finally, one could argue that the reportative uses of *wollen* and *möchte* cover a broader range of interpretation than is usually assumed. Besides its reference to a claim, it could possibly denote a confession as well. This would be appropriate in the examples given above. Yet, it remains to be explained why this shift occurs only if a negation is present. Apart from that, it appears to be plausible that the strange interaction is a result of an implicature, just as in the case of *sollen*, as was pointed out in Section 2.2.6.2. Unless *möchte* is not found in environments without negation, we should not jump to the conclusion that it can be considered as a reportative modal verb without any restriction.

2.2.8.8 Raising infinitives with clause modification

Finally, there are a couple of instances which appear to be interpreted in an epistemic way. According to Vater (2010: 107), epistemic instances of *möchte* can be observed in Saxonian dialects, cf. (344).

- (344) a. A: Kommt Paul morgen?
comes Paul tomorrow
- b. B: Das möchte schon sein.
That might PAR be-INF
A: ‘Does Paul come tomorrow?’
B: ‘It could be.’

In example (344) provided by Vater (2010: 107), it is not obvious to what extent the instance of *möchte* is indeed derived from its volitional use. If this is the case, it should be possible to substitute it by its volitional relative *wollen* without changing the communicative effect. Alternatively, this occurrence of *möchte* reflects the old use as a possibility verb. In this case, its appropriate substitute would be *könnte*.

Occasionally, instances of epistemic *möchte* can be found where this verb is more adequately replaced with *könnte*, as in the pattern in (345) given by Zifonun (1997: 1270), and in example from the DeReKo corpus (346).

- (345) Nicht so sehr von dem Gedanken, daß Eduard unter
NEG so much by the thought that Eduard under
Umständen für ihre Ehre sein junges Leben möchte in die
circumstances for her honour his young live wants in the
Schanze zu schlagen haben,– die romantische Vorstellung
entrenchment to beat-INF have-INF the romantic image
obgleich sie darüber geweint hatte, ließ ihr Herz eher höher
even.if she there cried had let her heard rather higher
schlagen.²⁶³
beat-INF

‘It was not so much this thought that Eduard possibly would risk his life to defend her honour, it was rather the romantic image that made her heart beat faster – even if she had cried about it.’

263 Thomas Mann, *Erzählungen* volume 8, as cited in Zifonun (1997: 1270).

- (346) Erbrochenes, Schweiß, Kot und Sperma ziehen sich durch
 vomit sweat faeces and sperm draw REFL through
 das Werk, als wär's ein neuer Megaseller von Charlotte
 the act if is-SBJV.PST a new bestseller by Charlotte
 Roche. Ist es aber nicht. Gottlob, möchte man meinen.²⁶⁴
 Roche is it but NEG thank.god could one opine-INF

'The book is full of vomit, sweat, faeces and sperm, as if it was a new bestseller by Charlotte Roche. But it is not. "Thank God", the readers could opine.'

Epistemic *möchte* does not occur very frequently with a possibility interpretation anymore in German. It is mostly restricted to idiomatic collocations such as *möchte meinen* 'could believe' (cf. 346). The context of this example is rather opaque. A similar occurrence of *möchte* is discussed by Welke (1965: 116).

2.2.9 *brauchen*

In contrast to the items discussed so far, *brauchen* 'need' has a very different origin with respect to its morphological paradigm. It is neither a preterite-present, nor did it develop from a former optative form, as in the case of *wollen*. Nevertheless, it exhibits a whole range of properties which are typical of the six traditional modal verbs. However, its precise status is contested. On the one hand, grammarians such as Engel (1996: 463), Weinrich (1993: 300) and Szumlakowski (2010: 79) regard *brauchen* as a fully developed modal verb, while others, such as Brinkmann (1962: 363) and Öhlschläger (1989: 8), explicitly exclude *brauchen* from the class of modal verbs. Less clearly, the latest edition of the popular *Duden* grammar edited by Eisenberg et al. (2005: 562) appears to be inclined to consider *brauchen* as a modal verb: "*brauchen* ist seiner Verwendung nach den Modalverben zuzurechnen" ('Regarding its uses, *brauchen* has to be considered as modal verb').

What arguments are there in favour of the view that *brauchen* should be considered as a modal verb? There are at least six reasons. Firstly, it shares an essential morphological peculiarity with the traditional six modal verbs: (i) In perfect tense, the past participle selected by the tense auxiliary *haben* 'have' is formally identical to the infinitive. This phenomenon is referred to as *infinitivus pro participio*; the (IPP)-effect and was discussed at length in Section 2.1.1.2. (ii) Kolb (1964: 74) has shown that *brauchen* unexpectedly acquired the irregular subjunctive of the past form *bräuchte* 'need-SBJV.PST', which carries an *Umlaut*. Originally, *brauchen* is a regular verb, which do not carry an *Umlaut* in their past subjunctive forms. Moreover, there are syntactic similarities. Folsom (1968: 322–323) and

²⁶⁴ DeReKo: HAZ09/JAN.02665 Hannoversche Allgemeine, 19/01/2009.

Szumlakowski (2010) have pointed out that *brauchen* can sometimes occur with (iii) a bare infinitive complement and (iv) verbless directional phrases, just as the traditional six modal verbs do. Apart from that, (v) *brauchen* is restricted to negative environments. In this respect it behaves like a whole range of other modal auxiliaries, such as raising *wollen* (cf. Section 2.2.3.5) and volitional *mögen* (cf. Section 2.2.7). Furthermore, Bech (1951: 14), Kolb (1964: 73) and Lenz (1996: 399) have shown that *brauchen* is just as negative polar as its predecessor *dürfen* (cf. Section 2.2.4). Finally, there are also semantic reasons that speak for an analysis of *brauchen* as a modal verb. As Kolb (1964: 74), Lenz (1996: 402) and Askedal (1997a: 61) illustrate, (vi) *nicht brauchen* ‘not need’ denotes a negated circumstantial necessity, just like *nicht müssen*. In addition, (vii) Takahaši (1984), Askedal (1997a: 62) and Reis (2005a: 112) point out that there are instances of *brauchen* that appear to involve an epistemic interpretation.

By contrast, there are a couple of considerations that led other authors to the conclusion that *brauchen* should not be fully considered as a modal verb in German. Some authors, such as Brinkmann (1962: 363) and Maitz and Tronka (2009: 189), argue that *brauchen* differs crucially from the traditional modal verbs in various respects: (i) It selects *zu*-infinitive complements rather than bare infinitive complements, and (ii) it is restricted to negative polarity environments. However, as has been illustrated above, negative polarity is a property that occurs with three out of six members of the traditional modal verb class: volitional *mögen*, the raising use of *wollen* and *dürfen* up to the 16th century. Furthermore, Paul (1897: 79) demonstrates that *brauchen* has replaced *dürfen* in its original meaning. This indicates that negative polarity is rather a property typical of modal verbs. Apart from that, other authors, such as Folsom (1968: 328) and Öhlschläger (1989: 8), challenge the existence of an epistemic interpretation. Yet, these authors have not taken the corpus examples provided by Takahaši (1984) into account. As will be shown below, it is far from evident whether or not *brauchen* has a well established epistemic interpretation.

As it turns out, most of the remaining Germanic languages have an equivalent verb that reflects the situation in German almost exactly. Mortelmans, Boye and Auwera (2009: 17) illustrate that in Dutch *hoeven* ‘need’ usually selects *te* infinitive complements. Sometimes, it can be found with bare infinitive complements. Just like its German counterpart *brauchen* it is restricted to negative polarity environments. As Scaffidi-Abbate (1973: 14) points out, Afrikaans *bruik* exhibits almost the same property. Yet, he considers German influence fairly unlikely. As Kolb (1964: 76) and Scaffidi-Abbate (1973: 30) indicate, the verb *need* in English is a negative polarity item as soon as it selects infinitive complements. Similarly to *brauchen*, it was originally restricted to *to*-infinitive complements, rather than bare infinitive complements. In the course of history, bare infinitives became

possible as well. These observations can be extended to Northern Germanic languages as well. Eide (2005: 77) has demonstrated that *behøve* ‘need’ and *trengje* ‘need’ in Norwegian can be used to express a necessity. In this use, these verbs are negative polarity items and alternate between *å*-infinitive complements and bare infinitive complements. In a similar fashion, Mortelmans, Boye and Auwera (2009: 42) show that Danish *behøve* ‘need’ originally only selected *at* infinitive complements. At some later period, bare infinitive complements became possible as well. As Paulina Tovo (pers. commun.) has pointed out, it is restricted to negative environments in this use. As it turns out, all of these languages, which are genetically related to each other, have developed analogous patterns. Yet, the most astonishing fact is that almost each language has chosen a verb with a different etymological origin to adopt the role of *brauchen*. As Scaffidi-Abbate (1973: 20) remarks, this behaviour is parallel to Latin *uti*, which originally used to be restricted to negative environments.

This discussion about the precise status of *brauchen* with respect to the modal/auxiliary verbs has existed since the 19th century. As was illustrated in Section 2.1.1.2, Grimm (1837: 168, 949) is reluctant to consider *brauchen* as an auxiliary verb. According to him, verbs that select *zu*-infinitive complements are generally incompatible with the IPP-effect and must not be used in this way. In a note on page 949, he discusses an example of *brauchen* with *zu*-infinitive complement that exhibits the IPP-effect. By contrast, Becker (1836: 177 §91, 1842: 220 §91, 224 §93) explicitly classifies *brauchen* with an infinitive complement as a *Huelfs-verb des Modus* ‘auxiliary of mood’. He only considers cases in which *brauchen* selects *zu*-infinitive complements. And the fact that this configuration differs from more canonical modal verbs such as *müssen* does not appear to bother him. Decades later, Sanders (1908: 101), who is another normative grammarian, considers *brauchen* with the IPP-effect as fully grammatical and observes that the infinitive particle *zu* can be dropped under certain conditions even in formal language.

In the remainder of this section, the multitude of the different uses of *brauchen* will be discussed. Above of all, *brauchen* is used as a transitive verb that selects an accusative NP. In this use, it is not restricted to negative polarity environments. Moreover, it is occasionally found with finite *dass*-clauses. Furthermore, it can be used in an impersonal pattern with a non-referential subject NP. Most notably, it is used with a raising infinitive complement that exhibits a circumstantial interpretation. Next to a practical necessity reading, it can be used as a quantificational modal verb as well, just like *können* and *nicht müssen*. In the most canonical cases, it involves a subject-to-subject raising configuration, in some varieties a subject-to-object (AcI/ECM) pattern seems to be possible as well. Moreover, it can be combined with verbless directional phrases. Finally, it is very rarely recor-

ded with an epistemic interpretation. As it turns out, *brauchen* behaves, in many respects, like the most prominent members of the traditional six modal verbs.

2.2.9.1 Transitive uses

As is well known, *brauchen* is a transitive verb. Paul (1897: 79), Kolb (1964: 65), Scaffidi-Abbate (1973: 11, 19) illustrate that *brühhan/brühhen* in Old High German originally referred to the enjoyment or the consumption of something just as the English verbs ‘to enjoy/consume’ can be. In this period, it selected a genitive NP. Gradually, *brühhan/brühhen* developed a new meaning expressing the usage of an object. At the same time, it can be found with an accusative NP for the first time. Paul (1897: 79) and Scaffidi-Abbate (1973: 19) further demonstrate that *brauchen* acquired a new meaning in the 17th century. In texts from that period, it occasionally expresses a need or requirement. It merits closer attention that the new meaning of transitive *brauchen* was initially restricted to negative contexts, as Paul (1897: 79), Scaffidi-Abbate (1973: 19) and Kluge (2011: 147) have pointed out. In the course of time, transitive *brauchen* became acceptable in non-negative environments as well. With the latter meaning, it can frequently be found. Interestingly, the transitive use with an accusative NP drastically outweighs the uses with an infinitive. The examples in (347)–(351) reflect the range of different uses and morphological peculiarities.

- (347) 1,5 Kilogramm brauchte der arbeitslose Drogenabhängige für
1.5 kilo.gramme needed the unemployed drug.addict for
den Eigenbedarf.²⁶⁵
the personal.need

‘The unemployed drug addict needed 1.5 kilogramme for personal need.’

- (348) Dass der Mann Geld gebraucht hat, wissen wir, sonst
that the man money need-PPP(ge) has know we otherwise
hätte er den letzten Banküberfall nicht begangen.²⁶⁶
had he the last bank.robbery NEG committed

‘We know that the man needed money. Had the man not needed money he would not have committed the last bank robbery otherwise.’

²⁶⁵ DeReKo: E99/OKT.27727 Zürcher Tagesanzeiger, 22/10/1999.

²⁶⁶ DeReKo: N00/JUN.25283 Salzburger Nachrichten, 03/06/2000.

- (349) „Aber wollte Mannheim von der Industrialisierung nicht
but want-SBJV.PST Mannheim from the industrialisation NEG
abgehängt werden und zurückfallen, brauchte es
outdistance-PPP PASS.AUX-INF and fall.back-INF need-SBJV.PST it
neue Flächen“, verdeutlichte Probst.²⁶⁷
new surface clarified Propst
' "If Mannheim did not want to be outdistanced from the Industrialisation and fall
back, it would need new surfaces" Probst clarified.'
- (350) Ein Personenzug bräuchte für die rund elf
a passenger.train need-SBJV.PST for the about eleven
Bahnkilometer nach Innsbruck hingegen nur elf Minuten.²⁶⁸
train.kilometres to Innsbruck however only eleven minutes
'However, it takes a passenger train only eleven minutes to get the eleven kilometres
to Innsbruck.'
- (351) Zwölf Jahre braucht er, um die Sonne einmal zu
twelve years need he in.order the sun once to
umrunden.²⁶⁹
orbit-INF
'It takes it twelve years to orbit the sun once.'

Crucially, the past participle of transitive *brauchen* is realised as a canonical *ge*-participle in example (348). In this environment, it cannot be substituted with the IPP *brauchen*. As indicated above, there are two alternatives of realising the subjunctive past form. The regular form illustrated in (349) is identical to the indicative past tense form *brauchte*. As the conditional configuration given in (349) requires the subjunctive of the past, it becomes obvious that *brauchte* is interpreted as a subjunctive of the past, rather than the indicative of the past. Apart from that, there is also the irregular form *bräuchte*, which differs from the weak form in that it carries an *Umlaut*, as is demonstrated in example (350).

This illustrates that the two morphological peculiarities of *brauchen* behave in a different way: While the IPP is restricted to the uses of *brauchen* with infinitive complements, the strong form of the past subjunctive is also available for the transitive uses of *brauchen*.

Finally, there is a related use of *brauchen* in which it selects an NP, a PP or a AP, and where expresses a time interval or other measures that are necessary

267 DeReKo: M04/JUL.45250 Mannheimer Morgen, 07/07/2004.

268 DeReKo: I97/MAI.16915 Tiroler Tageszeitung, 03/05/1997.

269 DeReKo: HAZ09/AUG.04419 Hannoversche Allgemeine, 28/08/2009.

to achieve a certain goal.²⁷⁰ While the measure can be realised as an accusative NP, the goal can be either realised as a PP (cf. *nach Innsbruck* ‘to Innsbruck’ in example 350) or as an adverbial *um zu*-infinitive (cf. 351). But the measure phrase can also be realised as an adverb such as *lange* ‘long’. Furthermore, Stefan Müller (pers. commun.) has observed that the NP which expresses the measure does not agree with the passive auxiliary if *brauchen* is passivised. Rather, the passive auxiliary always exhibits the default morphology, which is 3rd pers. singular.

- (352) [...] weil dafür mehrere Tage gebraucht
 because therefore several days-ACC need-PPP
 wurde/*wurden.
 PASS.AUX-SG/ PASS.AUX-PL
 ‘[...] because it took several days for that.’

These facts indicate that this use of *brauchen* has to be considered as an independent syntactic pattern.

2.2.9.2 Impersonal *brauchen*

Brauchen can be used as an impersonal verb that lacks a referential subject argument. This use was already mentioned by Adelung (1793: 1162), Grimm and Grimm (1860: 318) and Paul (1897: 79). Their observation is mainly based on evidence from writers of the 18th century. *Brauchen* is only found with the new interpretation, in which it refers to a need. In contrast to the transitive use, it selects the non-referential pronoun *es* ‘it’ as a subject argument and an accusative NP. Accordingly, the need is not attributed to the subject referent. Rather, the bearer of the need remains unspecified. In all of the examples (353)–(355), the subject NP *es* is not a referential pronoun: first, it does not identify the bearer of the need and second, it does not refer to a neuter noun that has been mentioned in prior discourse. In example (353), there is no salient antecedent NP specified for neuter in the preceding context. The referent to which the need is attributed is anybody who has to wait for a longer period. Accordingly, the impersonal variant of *brauchen* was chosen, in order to leave the bearer of the need as unspecified and generic as possible.

- (353) Werner Ignaz Jans ist ein ungeduldiger Mensch. Und Geduld
 Werner Ignaz Jans is a impatient man and patience
 bräuchte es eigentlich, um ein guter Warter zu sein.²⁷¹
 need-SBJV.PST it actually in.order a good waiter to be-INF

²⁷⁰ That this use should be considered as an independent use rather than a variant of the transitive use was pointed out to me by Stefan Müller (pers. commun.).

‘Werner Ignaz Jans is an impatient man. And it is patience that would be actually necessary in order to wait a long time.’

- (354) Es sieht nicht gut aus für den Frieden in Nahost.
 it sees NEG good out for the piece in middle.east
 Wahrscheinlich braucht es ein viertes Wunder, damit er eine
 probably need it a fourth wonder in.order.to he a
 neue Chance erhält.²⁷²
 new chance gets

‘There is not much hope for the peace in the Middle East. Probably, a fourth wonder is necessary in order to give it a new chance.’

- (355) Was braucht es außer dem, als daß sie selbst dich liebt?²⁷³
 what needs it apart that as that she self you loves?
 ‘What else is necessary as the circumstance that she loves you?’

Interestingly, the impersonal variant of *brauchen* found in DeReKo primarily occurs in Swiss newspapers. This high frequency of this pattern in Swiss German could be due to language contact: There is a similar pattern in French that corresponds almost one-to-one to its German counterpart: *il faut* ‘it necessitates’. Yet, the use of impersonal *brauchen* is not restricted to texts from Switzerland. Occasionally, it can be found in newspapers from other regions as well, as an occurrence taken from a news paper from Lower Saxony indicates (cf. 354). Moreover, this pattern can already be found in the early 18th century, in a poem written by Gottsched (cf. 355). According to Grimm and Grimm (1860: 318), Kluempers (1997: 87) provides an example exhibiting the impersonal use. It is attributed to Johann Balthasar Schupp, who lived from 1610–1661.²⁷⁴

- (356) derowegen braucht es mühe (kostet es m.) dasz du wahre
 therefore need it effort (cost it effort) that you true
 freund erwehlest.²⁷⁵
 friend chose
 ‘Therefore, effort is required to chose true friends’

²⁷¹ DeReKo: A01/NOV.42609 St. Galler Tagblatt, 13/11/2001.

²⁷² DeReKo: BRZ06/JAN.09059 Braunschweiger Zeitung, 19/01/2006.

²⁷³ Johann Joachim Schwaben *Herrn Johann Christoph Gottscheds Gedichte XVI. Schreiben an Hrn. D. Gottfr. Thomas Ludewig, bey seiner Verheirathung 1732*. Leipzig, Breitkopf (1751), p. 408.

²⁷⁴ Kluempers (1997: 87) erroneously ascribes the example to Hans Jakob Christoffel von Grimmelshausen, the author of *Der Abentheuerliche Simplicissimus Teutsch* (1668) – but this is a result of a misinterpretation of Grimm’s system of labelling the sources.

²⁷⁵ Schuppianus, 756 (around 1650), as quoted in Grimm and Grimm (1860: 318).

This is in accordance with the hypothesis that this pattern emerged due to French influence. As Bloch and Wartburg (1986: 252) demonstrate, the verb *faillir* ‘need’ developed the impersonal pattern *il faut* in the 14th century. At that time it spread consecutively and became a dominant item to express a need. In turn, the existence of impersonal *brauchen* possibly had an impact on the development of *brauchen* with an infinitive. As will be shown below, *brauchen* with an infinitive involves a raising pattern which is characterised by the lack of the subject argument. It could turn out that the impersonal use of *brauchen* was a prerequisite for the development of the pattern with a raising infinitive. Yet, it is fairly likely that *brauchen* was not directly influenced by the French verb *faillir*. Scaffidi-Abbate (1973: 27) has pointed out that its predecessor *dürfen* in its old interpretation (‘need’) had already developed an analogous impersonal pattern in the early 16th century. In this pattern, the object of *dürfen* is realised as a genitive NP. One of the crucial examples provided by the DWB is given in (199) on p. 115 in Section 2.2.4. Only in a subsequent period was the impersonal use of *dürfen* replaced with its prefixed counterpart *bedürfen*. Finally, after *brauchen* adopted the old patterns of *dürfen*, it acquired an impersonal use as well. It is quite likely that it initially selected a genitive NP in that configuration, which were replaced with an accusative NP in the course of history.

2.2.9.3 *dass*-clauses

Brauchen can occasionally select finite *dass*-clauses. It appears that this use is restricted to certain registers, as it could not be found in the DeReKo corpus.²⁷⁶ By contrast, it can be frequently found on the web, as is exemplified in (357).

- (357) Ich brauche nicht, dass meine Fingerabdrücke irgendwo
 I need NEG that my fingerprints somewhere
 abgespeichert sind, solange das nicht von der Polizei
 store-PPP are, as.long.as that NEG by the police
 zwangsweise aufgenommen wurde.²⁷⁷
 compulsorily record-PPP PASS.AUX.PST
 ‘I do not need that my fingerprints are recorded unless this has been requested by the police.’

It merits closer attention that utterances such as (357) are significantly more acceptable if they involve a negative operator. It seems, then, that *brauchen* with

²⁷⁶ The research was carried out on 20th June 2012 and it was based on the query &brauchen ‘nicht’ dass.

²⁷⁷ <http://www.computerbase.de/forum/archive/index.php/t-842737.html>, accessed on 23th May 2012.

finite *dass*-clause is a negative polarity item, just like its cognate which takes infinitive complements. This illustrates that there is a strong link between the use that embeds non-finite clauses and the one that embeds finite clauses. This is reminiscent of the volitional uses of *mögen*: both uses that embed a finite *dass*-clause or a control infinitive are negative polar.

Interestingly, *dürfen*, in its old interpretation ('need'), is documented in such a configuration as well, as Scaffidi-Abbate (1973: 27) has demonstrated.

2.2.9.4 Raising infinitives with event modification

The most thoroughly discussed use of *brauchen* is the one with an infinitival complement. A whole range of authors have pointed out that it exhibits numerous parallels with the six traditional modal verbs in morphological, syntactic and semantic respect. Becker (1836: 177 §91) is the first one to explicitly consider *brauchen* with *zu*-infinitive as a 'mood auxiliary'. In the first edition of his grammar, Grimm (1837: 949) observed that *brauchen* with *zu*-infinitive can exhibit the IPP-effect. As one of the first scholars, Paul (1897: 79) associates *brauchen* with an infinitive complement with the class of preterite presents/traditional modal verbs. As he states, *brauchen* has replaced *dürfen* in its original use, which referred to a need or requirement.²⁷⁸ In the same period, Sanders (1908: 101) advised using *brauchen* with a bare infinitive complement. In its first small description, Bech (1955: 210–212) notices that *brauchen* is semantically equivalent to *müssen* and furthermore provides some corpus examples from standard written language. The two studies by Kolb (1964) and Folsom (1968) have pointed out even more parallels with the traditional modal verbs in syntactic and semantic respects. More recent studies, such as Takahaši (1984), Askedal (1997a) and Reis (2005a), deal with the extent to which *brauchen* allows for an epistemic interpretation. They will be taken into consideration in the remainder of this section.

The uses of *brauchen* with an infinitive turn out to be fairly heterogeneous. This is due to the process of grammaticalisation by which this verb is affected. In order to capture the uses of *brauchen* in the most efficient way, it becomes necessary to consider its development as well. Thus, the following section will take a diachronic perspective at places.

Circumstantial *brauchen* with a raising infinitive complement occurs in the DeReKo corpus far less frequently than its transitive counterpart. A similar observation was made by Pfeffer (1973: 90) for both written and spoken language. As pointed out by Kolb (1964: 64), Folsom (1968: 328), Scaffidi-Abbate (1973: 31), Askedal (1997a: 53) and Reis (2005a: 104), normative grammarians do not toler-

²⁷⁸ Original quotation: *In dieser Verwendung ist brauchen an die Stelle von dürfen getreten.*

ate the use of *brauchen* with a bare infinitive complement, they only consider the use with *zu*-infinitive complement acceptable. A similar view is held by Jäger (1968: 332). In the course of the 20th century, *brauchen* with a bare infinitive complement was stigmatised as inferior German. Accordingly, *brauchen* is predominantly used with *zu*-infinitives in written language. Likewise, Pfeffer (1973: 91) could not find *brauchen* with bare infinitive complements in his corpus of written language.

- (358) Glücklicherweise brauchte niemand evakuiert zu werden,
 Luckily needed nobody evacuate-PPP to PASS.AUX-INF
 denn in die Zimmer der Bewohner war der Rauch nicht
 because in the room the-GEN tenants-GEN was the smoke NEG
 gelangt.²⁷⁹
 get-PPP
 ‘Luckily, nobody needed to be evacuated as the smoke did not get into the rooms of the tenants.’
- (359) Der kostbare Schatz bräuchte nur gehoben zu werden.²⁸⁰
 the precious treasure need-SBJV.PST only heave-PPP to PASS.AUX
 ‘The precious treasure would just need to be heaved.’
- (360) Man braucht nicht weit zu sehn, viel Jammer und Gefahr.²⁸¹
 one need NEG far to see-INF much misery and danger
 ‘One does not need to look far for much misery and danger.’
- (361) Man siehet aber auch dabey, daß die Schmoschen nicht enge zu
 one sees but also there that the loop NEG tight to
 seyn brauchen.²⁸²
 be-INF need
 ‘One can see here, that the loops do not need to be tight.’
- (362) Ein Frauenzimmer braucht nicht gelehrt zu seyn.²⁸³
 a woman.room need NEG adept to be-INF
 ‘A woman does not need to be adept.’
- (363) Wir brauchen ja nicht zu lieben²⁸⁴
 we need PART NEG to love-INF

²⁷⁹ DeReKo: RHZ09/DEZ.06729 Rhein-Zeitung, 07/12/2009.

²⁸⁰ DeReKo: P97/APR.13472 Die Presse, 08/04/1997.

²⁸¹ Johann Christian Günther *Ode an Herrn Marckard von Riedenhause Ivris Vtrivsqve Cvltor* (1720) in *Johann Christian Günther Werke* edited by Reiner Bölhoff, Frankfurt: Deutscher Klassiker Verlag, p.620.

²⁸² Kurtzer doch gruendlicher Begriff der Edlen Jaegererey. Nordhausen: Groß (1730), p. 498.

²⁸³ Christian Fürchtgott Gellert, *Die Betschwester*, II. Aufzug 3 Aufzug (1745).

‘We do not need to love.’

- (364) Wir brauchen nur verstellt zu weinen: So thun sie ihre
we need only feignedly to cry-INF so do they their
Schuldigkeit.²⁸⁵
guiltiness

‘We only need to cry feignedly and they will do their part.’

- (365) Man braucht nur in dem großen Buche der Welt lesen zu
one need only in the big book the-GEN world read-INF to
können, und man wird auf den meisten Seiten desselben so viel
can and one will at the first pages of.it so much
Anschweifung finden, daß man fast nur ein glücklicher
inspiration find-INF that one almost only a happy
Abschreiber zu seyn braucht,²⁸⁶
copyist to be-INF needs

‘One only needs to be able to read in the big book of the world and one will find so much inspiration in these pages that one almost only needs to be a lucky copyist.’

- (366) ATTINGHAUSEN: [...] Unter der Erde schon liegt meine Zeit /
under the earth already lies my time
Wohl dem, der mit der neuen nicht mehr / braucht zu leben!²⁸⁷
well him who with the new NEG more needs to live-INF
‘ATTINGHAUSEN: [...] My age has long been laid beneath the sod / Happy the man,
who may not live to see / What shall be done by those that follow me!’

As examples (360) and (361) indicate, *brauchen* with an infinitive can already be observed from the early 18th century onwards. Further early examples are provided by Adelung (1793: 1162) and the DWB in Grimm and Grimm (1860: 318), see (362)–(364). Moreover, *brauchen* occurs fairly often in works written by Lessing (1729–1781).

Moreover, there are early instances of prefixed *gebrauchen* ‘use’ + *zu* infinitive with the same interpretation like *brauchen*, as is illustrated in (367). This is interesting, as *gebrauchen* has retained its original meaning ‘to use’.

²⁸⁴ Christian Fürchtegott Gellert, *Die Zärtlichen Schwestern*, I. Aufzug. 6. Auftritt (1747).

²⁸⁵ Christian Fürchtegott Gellert, *Das Orakel* 1. Aufzug 4. Auftritt, (1747).

²⁸⁶ Johann Andreas Cramer, *Der Nordische Aufseher* Kopenhagen und Leipzig: Johann Benjamin Ackermann, (1758) sechstes Stueck, p. 57.

²⁸⁷ Friedrich von Schiller, *Wilhelm Tell* II.1 (1805).

- (367) An den beyden Seiten g g ist dieses Behaeltnis leer geblieben,
 at the both sides g g is this container empty stay
 damit man neben dem Lohbeete etwas hoehere
 in.order.to one next the greenhouse something high-COMP
 Baeume stellen koenne; denn da ein solches Caldarium nicht hoch
 trees put can since as a such caldarium NEG high
 zu seyn gebraucht, so ist es auch oben durch eine besondere
 to be-INF needs so is it also up by a particular
 brette, hinten abfallende und auf der Mauer c ruhende Decke
 wooden back gradient and at the wall c resting ceiling
 abgeschoren worden.²⁸⁸
 shave-PPP PASS.AUX

‘This container remains empty at both sides g g, so we can set the trees next to the underground greenhouse higher. Since such a caldarium does not need to be high, it has been covered by a particular gradient wooden ceiling that rests on the wall c.’

Sanders (1908: 101) and Wustmann (1908: 354) recommend refraining from using (transitive) *gebrauchen* in order to refer to a need for something. According to them, the correct use of *gebrauchen* expresses, rather, a usage of something.

A small corpus study investigating ancient Greek and Latin epic poetry translated by Johann Heinrich Voß, comprising Homer’s *Odysee* and *Illias*, Ovid’s *Metamorphoses* and Vergil’s *Äneide*, indicates that all of the occurrences of *brauchen* with an infinitival complement found in these texts select a *zu*-infinitive, and they are negative polarity items. In sum, four instances of *brauchen* could be found. Surprisingly, it did not occur in the *Äneide*.

- (368) Jetzo, Telemachos, brauchst du dich keineswegs zu scheuen!²⁸⁹
 now Telemachos need you REFL by.no.means to dread-INF
 ‘Now, Telemachos you do not need by no means to dread.’
- (369) Aber das wißt ihr selber; was brauch’ ich die Mutter zu
 but that know you yourself what need I the mother to
 loben?²⁹⁰
 praise-INF
 ‘But you know it yourself; what urges me to praise my mother?’

288 Freiherr von Otto Münchhausen, *Monatliche Beschaeftigungen fuer einen Baum- und Plantagen=Gaertner*, Hannover (1771), p. 202.

289 *Odysee*, III, 14 translated by Johann Heinrich Voß, (1781).

290 *Odysee*, XXI, 110 translated by Johann Heinrich Voß, 1781.

- (370) Alter sie weiß es schon; du brauchst dich nicht zu
 old.man she knows it already you need REFL NEG to
 bemühen.²⁹¹
 seek-INF
 ‘Old man, she already knows it, you do not need to make an effort.’
- (371) Deine Tapferkeit kenn’ ich; was brauchtest du dieses zu sagen?²⁹²
 your courage know I what needed you this to say-INF
 ‘I know your courage, what urged you to speak these words?’
- (372) Woll’ auch diesen verzeihn! – Für uns nicht brauchst du zu
 want also them forgive-INF for us NEG need you to
 beten!²⁹³
 pray-INF
 ‘Forgive them, too – You do not need to pray for us.’
- (373) O ihr Himmlischen alle gemeinsam / Rief er aus, unwissend,
 oh you divine all together shouted he out unaware
 nicht alle sie brauch’ er zu bitten.²⁹⁴
 NEG all them need-Ø he to beg-INF
 ‘Oh you all of you divines together, shouted he out, unaware that he did need not to beg
 all of them.’
- (374) Doch nicht brauch’ ich mein Thun vor euch zu erzählen,
 but NEG need I my deeds in.front.of you to tell-INF
 Pelasger,/ Mein’ ich; ihr sahet es ja.²⁹⁵
 Pelasger think I you saw it PART
 ‘But I do not need to tell you about my deeds, Pelasger, as I think, because you have
 already seen them.’
- (375) Nicht, daß den Pöantiden verweilt die vulkanische
 NEG that the-DAT Poeantides-DAT stays the vulcanic
 Lemnos,/ Brauch’ ich Rede zu stehn;²⁹⁶
 Lemnos need I speech to stand-INF

²⁹¹ *Odyssee*, XXIV, 406 translated by Johann Heinrich Voß, (1781).

²⁹² *Illias*, XIII, 275, translated by Johann Heinrich Voß, (1793).

²⁹³ *Verwandlungen, Third book – Pentheus*, I, 192.104, translated by Johann Heinrich Voß, Berlin: Friedrich Vieweg der Ältere (1798).

²⁹⁴ *Verwandlungen, Sixth book – Niobe*, I, 330.116, translated by Johann Heinrich Voß, Berlin: Friedrich Vieweg der Ältere (1798).

²⁹⁵ *Verwandlungen, Thirteenth book – Ajax and Ulysses*, II.284.29, translated by Johann Heinrich Voß, Berlin: Friedrich Vieweg der Ältere (1798).

'I do not need to justify why the Poeantides maintain the vulcanic Lemnos.'

The pattern in (373) deserves closer attention, as it exhibits a 3rd person singular form which lacks the *t*-suffix, just like preterite presents do. Yet, given the AcI-pattern in (376) taken from Ovid's Latin original, it is fairly likely that the elided form *brauch'* employed by Johann Heinrich Voß has actually to be considered as a syncope of an underlying subjunctive of the present form, which is spelled out as *brauche*. In this type of configuration, it is much more plausible to derive a form as the one given in Voß' verse.

(376) *dixerat ignarus* [aci non omens esse rogandos]²⁹⁷
 said-3PS unaware-NOM NEG all-ACC be-INF ask-GER.ACC
 'Unawerly, he said that not all of them are to ask.'

As pointed out by Till Kulawik (pers. commun.), the interpretation of the form *brauch'* as a subjunctive of the present is fairly plausible, as this grammatical mood is uniquely used to mark reported speech, just as the AcI-complement does in the Latin original. At any rate, for some mysterious reason the form *brauch'* is only used in the first editions of the translation provided by Voß, and is replaced with the less marked form *braucht* in later editions. The 3rd person singular pattern *brauch'* will be discussed in more detail below.

As this tendency is reflected by the other examples as well, it appears that *brauchen* was already restricted to the *zu*-infinitive in the 18th century. The very rare instances of positive *brauchen* with an infinitive that are found in that period will be discussed below.

The examples in (369) and (371) merit closer inspection, as they involve a recurrent pattern. Both of the instances of *brauchen* occur in questions that contain a causal use of the interrogative pronoun *was* 'what'. As Holler (2009) observes, *was* is occasionally interpreted as a causal *wh*-pronoun, much in the way of *why*. As can be seen, early instances of *brauchen* with *zu*-infinitives can often be found in this configuration. Accordingly, it is plausible that this pattern had an impact on the development of *brauchen*.

In the early 18th century, the use of *brauchen* with an infinitive complement was not addressed in the respective entry of the main dictionaries, cf. Kramer (1702a: 142). This is further confirmed by Scaffidi-Abbate (1973: 4), who provides a comprehensive overview of the main grammars from the 17th and the 18th centuries. Adelung (1793: 1162) is the first one to mention *brauchen* with *zu* in a very brief

²⁹⁶ *Verwandlungen, Thirteenth book – Ajax and Ulysses*, II.309.329, translated by Johann Heinrich Voß, Berlin: Friedrich Vieweg der Ältere (1798).

²⁹⁷ I am indebted to Till Kulawik, who helped me to find and properly analyse the corresponding original Latin example taken from Ovid.

remark. His observations are supported by evidence from two writers from the 18th century: Gellert and Wieland. Becker (1836: 177 §91) has pointed out that *brauchen* with *zu*-infinitive belongs to the field of modal verbs. Likewise, Grimm (1837: 949) provides an example exhibiting the IPP. Subsequent grammarians, such as Schotensack (1856: 295, 297) begin to stress the close relation between *brauchen* and auxiliaries (*Hilfsverb*).

In what follows, it will be investigated to what extent *brauchen* shares the essential properties of the traditional six modal verbs. What properties speak in favour of an analysis of *brauchen* as a modal verb? Three different types of properties will be taken into consideration: morphological features, syntactic features and semantic features. As far as morphological aspects are concerned, *brauchen* is optionally realised as an irregular form when used in the subjunctive of the past that carries an *Umlaut*, as is illustrated in (359). However, this irregular form is not restricted to uses of *brauchen* with an infinitive complement. Kolb (1964: 74), Scaffidi-Abbate (1973: 32) and Girnth (2000: 120) argue that this development is an approximation towards the morphological paradigm of the six traditional modal verbs. They assume that it is an essential characteristic of these verbs that they form the subjunctive of the past with a form containing the *Umlaut*. Accordingly, they conclude that it is this fact that causes *brauchen* to chose this unexpected form. However, this is not entirely correct. Firstly, almost every irregular verb in German forms its subjunctive of the past form with an *Umlaut*. In the canonical case, the indicative past tense form of an irregular verb serves as the base for the subjunctive of the past form in which the stem vowel is altered by an *Umlaut*, cf. *war* ‘be-PST’ – *wäre* ‘be-SBJV.PST’, *kam* ‘come-PST’ – *käme* ‘come-SBJV.PST’ or *wußte* ‘know-PST’ – *wüßte* ‘know-SBJV.PST’. Crucially, this does not hold for two of the core members of the traditional six modal verbs: The indicative past form and the subjunctive past form of *wollen* and *sollen* are in each case identical and do not carry any *Umlaut*: *wollte* and *sollte*. Furthermore, the two verbs do not fulfil all of the morphological criteria typical of preterite presents, as illustrated in Section 2.1.1. Alternatively, one could assume that the development of the irregular form of *brauchen* has pragmatic reasons. Being a regular verb, *brauchen* does not have distinct forms for the indicative past and the subjunctive of the past form. Any verb in German can alternatively be realised as an analytic subjunctive of the past based on the subjunctive auxiliary *würde* ‘would’, as was demonstrated in Section 2.2.7. As *brauchen* already selects an infinitive complement, a further auxiliary would increase the degree of syntactic complexity and processability. For this reason, the development of a proper synthetic subjunctive of the past form for *brauchen* turns out to be a way which facilitates communication. According to this assumption, the irregular form *bräuchte* should first have emerged with *brauchen* with an infinitive complement. Thus, there has to be a period in which *bräuchte* occurred more

often with infinitives than with accusative NPs. In any case, it remains to be seen to what extent the transitive use of *brauchen* and its use with a raising pattern have the same preference for the morphological realisation of the subjunctive of the past. It could turn out that one pattern exhibits a significantly stronger preference to be realised in the past subjunctive as the strong form, rather than the weak form. An alternative explanation is based on the observation that the stem *brauch-* could yield an umlaut in other derivations, such as the plural of the nominalisation *Bräuche* ‘costums’, or the adjective *bräuchlich* ‘in use’, ‘usual’. As these forms were very common at this period, speakers may have been inclined to adopt the umlaut for the subjunctive of the past as well.

Finally, this morphological peculiarity might have a different reason. Due to a lack of recorded preterite forms, it is not obvious at all to what extent *brūhhan* in Old High German belonged to the regular *-jan* or irregular *-an* verbs, as has been illustrated by Kolb (1964: 68) and Scaffidi-Abbate (1973: 15ff.).

The earliest attested occurrences of *bräuchte* originate from the 18th century, approximately the same period when *brauchen* started to select infinitive complements. In both instances, it selects an accusative NP rather than an infinitive complement. This is not surprising, as the transitive use of *brauchen* has always been the dominant one. Moreover, it already reflects the new interpretation in which it expresses a need for something rather than the use of something.

- (377) Bräuchte man hier nicht einen Oedip?²⁹⁸
 need-sbjv.pst one here NEG a Oedip
 ‘Do we not need an Oedip here?’
- (378) Ein Fürst bräuchte keine Tugend, wenn er seyn will,
 a sovereign need-SBJV.PST no virtue if he be-INF wants
 was er soll, ein Vater des Vaterlandes²⁹⁹
 what he should a father the-GEN fatherland-GEN
 ‘A sovereign would not need any virtue if he wants to be what he ought to be: A father of the fatherland.’
- (379) Wo er darüber grieffe / vnnd mehr Ackers
 where he over touch-SBJV.PST and more acre
 bräuchte / zu solchem seinem sondern nutz / darfür
 need-SBJV.PST to such his particular use therefore

²⁹⁸ Johann Jakob Hemmer, *Abhandlung über die deutsche Sprache zum Nutzen der Pfalz*, Mannheim (1769), p. 221 §111.

²⁹⁹ Franz Berg, *Predigten über die Pflichten der höheren und aufgekärten Stände bey den bürgerlichen Unruhen unserer Zeit*. Wirzburg: Stahel (1793), p. 54.

soll er mir als vil frucht in der Schewer geben vnnnd bezalen
 shall he me as much fruit in the barn give-INF and pay-INF
 / als die selben Ecker vngefehrlich trügen.³⁰⁰
 as the same acres approximately bear-SBJV.PST

'If he uses more acres for his personal purpose, he should give and pay me approximately as much fruit into the barn as the same acres bore.'

Even if these examples do not involve infinitive complements, both occurrences exhibit some parallels to the patterns with infinitive complements. On the one hand, they originate from the same period when *brauchen* started to take infinitive complements, as will be illustrated below in more detail. On the other hand, both of them occur in a negative environment. As it turns out, the subjunctive form *bräuchte* can already be found without infinitive complements in the 18th century. According to the earliest occurrences found in the investigation discussed here (cf. 377–378), it is very likely that *bräuchte* developed independently from the infinitive complement. This is in strict contrast to the development of the IPP-effect: until the present day the IPP is excluded from transitive uses, even in East Bavarian dialects, which are known to be rather generous in the use of the IPP-effect, as has been shown by Aldenhoff (1962: 199) and Ørnes (2007: 131). This indicates that the morphological peculiarities of *brauchen* with an infinitive developed in distinct stages. As will be shown below, *brauchen* can be found with IPP-effect only around 1830. This is also the same period in which the first instances with bare infinitive complements occur. In brief, these facts cast further doubt on the assumption that the exceptional subjunctive form *bräuchte* has anything to do with the morphological peculiarities of the preterite presents, as has been suggested by Kolb (1964: 74), Scaffidi-Abbate (1973: 32) and Girth (2000: 120). Their explanation would become even less plausible if example (379) from the 16th century turned out to be valid. As far as the context is concerned, the example is perfect, all of the other lexical verbs bear the subjunctive of the past endings as well: *grieffe* touch-SBJV.PST and *trügen* 'bear-SBJV.PST'. For some mysterious reason, the irregular form *bräuchte* has been replaced with the regular one *brauchte* in the subsequent editions of this book from 1574 and 1577. An analogous case can be found in Moscherosch's *Alamodischer Politicus* from 1647. Once again, the *umlaut* is absent from the preceding edition from 1640.³⁰¹

300 Johann Peter Zwengel, *New Groß Formular und vollkommlich Cantzlei Buch von den besten und außserlesenen Formularien aller deren Schrifften/ so in Chur und Fürstlichen / auch der Grauen / Herren unnd anderen fürnemen Cantzleyen / Auch sonst in den Ampten unnd Ampts händeln / Deßgleichen under dem gemeinen Man / allerley fürfallendert geschäft halben / bräuchlich seindt – Reuerßbrieff vber bestandnen Bawhofe/sampt deren Güter* Frankfurt: Egenolffs Erben (1568), p. 158a.

As long as the status of the Umlaut of these examples is not confirmed, they will not be taken into further consideration. Yet, it deserves attention that the irregular form *bräuchte* is subject to criticism: According to Grebe et al. (1966: 114), the irregular subjunctive of the past *bräuchte* is not correct and has its origins in South German varieties. Similar judgements are found in the Duden dictionary for orthography edited by Scholze-Stubenrecht (2000: 245), in which it is mentioned that *bräuchte* is characteristic of colloquial language. Finally, the language purist Johannes Dornseiff in his book published in 2011 and entitled *Sprache wohin?* pleads for replacing the irregular subjunctive of the past *bräuchte* with the regular form *brauchte*.

One of the main morphological characteristics of preterite present verbs is that they do not carry a suffix in the present tense forms of the 1st and the 3rd person singular, as shown in Section 2.1.1. As Kiaulehn (1965: 52) notices, *brauchen* has lost its *t*-suffix in the 3rd person singular whenever it takes a (bare) infinitive complement in spoken German in Berlin. Likewise, Folsom (1968: 328 Fn. 84), Wurzel (1984: 117 & 149) and Birkmann (1987: 5) observe that the *t*-suffix in the 3rd person singular is about to disappear in other spoken varieties as well. Furthermore, Scaffidi-Abbate (1973: 32) shows that the omission of the *t*-suffix in the 3rd person singular indicative can be found in the spoken varieties in former Prussia, Rhineland and Palatine. As Girth (2000) illustrates, the *t* suffix of the 3rd person singular *braucht* has also disappeared in many dialects from Rhineland. Furthermore, he argues that this loss of the suffix is due to a morphological process of approximation which *brauchen* undergoes. Exhibiting modal meaning, it is about to adopt a morphological form for the 3rd person singular that corresponds to that of the six traditional modal verbs and which is spelled out as ‘*brauch*’. By contrast, Maitz and Tronka (2009: 192) point out that this loss has an independent phonological motivation, as the loss of a dental plosive is also recorded after a velar fricative in other words such as *nicht* ‘not’ → *nich*. As Maitz and Tronka (2009: 201) further illustrate, it is not excluded that this process may have been amplified by the morphological factors discussed by Girth (2000). In any case, the loss of the suffix *-t* in the third person singular is restricted to the spoken language of particular varieties.

The case of *need* in English exhibits a striking parallel. It was already shown by Sweet (1891: 421) that *need* optionally drops the suffix *-s* in the 3rd person singular indicative, preferably when used with an infinitive complement. Murray (1933: 71) could find this pattern in texts from the 16th century onwards. This leads

301 Johann Michael Moscherosch, *Alamodischer Politicus*, Cölln: Andreas Bingen (1640), p. 64. Johann Michael Moscherosch, *Alamodischer Politicus*, Cölln: Andreas Bingen (1647), p. 56.

Scaffidi-Abbate (1973: 32) to assume explicitly that the loss of the *t*-suffix in the case of *brauchen* is to be considered as a process of morphological approximation toward the paradigm of preterite present verbs.

Another essential morphological characteristic of the six traditional modal verbs is the so-called *infinitivus pro participio* (IPP)-effect, which was discussed in great detail in Section 2.1.1.2. As was shown, there is only a small group of verbs to which the IPP has to apply obligatorily, among them the traditional six modal verbs. As Kolb (1964: 76) and Schmid (2000: 331) point out, *brauchen* exhibits an obligatory IPP whenever it is used with an infinitive complement. In the corpus examples (380)–(381), the IPP form *brauchen* cannot be substituted with the *ge*-participle *gebraucht*.

- (380) Faust hätte die beiden ja auch einfach gar nicht zu
 Faust have-SBJV.PST the both PART also just INTN NEG to
 erwähnen brauchen.³⁰²
 mention-INF need-PPP(ipp)
 ‘It was not necessary that Faust mentioned both of them.’
- (381) Da habe Blaich nur zuzugreifen brauchen.³⁰³
 there have-SBJV.PRS Blaich only to.take-INF need-PPP(ipp)
 ‘In this situation, Blaich just needed to take it.’
- (382) die Regierung hätte das Buch gar nicht zu verbieten
 the government have-SBJV.PST the book INTN NEG to prohibit-INF
 brauchen, es wäre dennoch gelesen worden.³⁰⁴
 need-PPP(ipp) it is-SBJV.PST nevertheless read-PPP PASS.AUX-INF
 ‘It was not necessary that the government prohibited the book, it would have been read nevertheless.’
- (383) Nun eine solche hätte es auch gerade nicht zu seyn
 so a such have-SBJV.PST it also just NEG to be-INF
 brauchen,³⁰⁵
 need-PPP(ipp)
 ‘So, it was not necessary’

302 DeReKo: RHZ09/MAI.19683 Rhein-Zeitung, 23/05/2009.

303 DeReKo: BRZ07/MAI.18723 Braunschweiger Zeitung, 18/05/2007.

304 Heinrich Heine, *Reise nach Italien*, Abschnitt IV, in *Morgenblatt für Gebildete Stände*, N° 20, *Mittwoch 3. December 1828*, (1828) p. 1157.

305 Carl Ullmann, *Theologische Studien und Kritiken*, volume II (1) Hamburg: Friedrich Perthes (1829), p. 176.

- (384) dem Soldaten hätt ich nicht einmal brauchen einen
 the soldier have-SBJV.PST I NEG once need-INF a
 Schlaftrunk zu geben, er wäre doch nicht aufgewacht.³⁰⁶
 sleeping.draught to give-INF he SBJV-PST yet NEG wake.up-PPP
 ‘It was not necessary to give the soldier a sleeping draught, he would not have woken
 up anyway.’

The earliest attested examples of *brauchen* exhibiting an IPP are from the early 19th century (cf. 382 and 383), the former from Sanders (1908: 101). At the same time, Grimm (1837: 949) acknowledges that *brauchen* with *zu*-infinitive is found with the IPP-effect. His example is discussed in Section 2.1.1.2. In the section on the IPP, Grimm (1837: 168) declares that any verb that selects a *zu*-infinitive complement must not be combined with IPP-morphology. Interestingly, the Grimm brothers nevertheless employ *brauchen* with an IPP in their collection of fairy tales (cf. 384). By contrast, the normative philologist Wustmann (1908: 61) argues that *brauchen* with *ge*-participle is *fehlerhaft* ‘wrong’ and *ungeschickt* ‘awkward’ as soon as it selects a *zu*-infinitive complement. Aldenhoff (1962: 196) and Kolb (1964: 77) report that a whole range of grammarians in the 18th century share Grimm’s opinion. As they furthermore argue, this view is almost correct; however, there is one verb that does not conform to this tendency: *brauchen*, which is frequently found with *zu*-infinitives in this pattern. Likewise, Askedal (1997a: 55) demonstrates that *brauchen* with *zu*-infinitive does not fulfil all of the criteria required by the configuration in which the IPP usually occurs.

Today, it is generally acknowledged that *brauchen* can occur with the IPP despite its unexpected type of infinitive complement. How does this strange situation come about? As is evident, the driving force behind it are the fact that *brauchen* gradually adopted the semantic properties *müssen* and the existence of the ancient pattern of *dürfen*. Interestingly, the IPP was not the only option for *brauchen* with *zu*-infinitive. Numerous instances of *brauchen* with *zu*-infinitives can be found that are realised as *ge*-participles. The earliest dates back to the late 18th century (cf. 385), the latest originates from the late 19th century (cf. 389). Similar examples have been discussed by Sanders (1908: 101).

306 Jacob Grimm and Wilhelm Grimm, *Die zertanzten Schuhe in Kinder und Hausmärchen. Große Ausgabe*, (1837), p.553.

- (385) So unsäglich reich, daß er gleich 200.000 fl
 so inexpressibly rich that he immediately 200.000 fl
 wegschenken kann, hätte vielleicht Herr Ifler auch nicht
 away.give-INF can have-SBJV.PST maybe Mister Ifler also NEG
 zu seyn gebraucht.³⁰⁷
 to be-INF need-PPP(ge)
 'Mister Ifler did not need to be that inexpressibly rich that he could give away 200.000 fl at once.'
- (386) So hätte z. B. die Beschreibung des Zimmers in der
 so have-SBJV.PST e. g. the description the-GEN room-GEN in the
 Abtey, in welches Cordelia gebracht wird, für den Zweck
 abbey in which Cordelia bring-PPP PASS.AUX for the purpose
 des Dichters weit weniger umständlich zu seyn
 the-GEN poet-GEN far less cumbersome to be-INF
 gebraucht.³⁰⁸
 need-PPP(ge)
 'For example, the description of the room in the abbey into which Cordelia was brought did not need to be as cumbersome for the purpose of the poet.'
- (387) Man sieht sehr oft diese Pflicht ganz unrichtig an; als ob man
 one sees very often these duties very incorrect on as if one
 verbunden sein könnte, dieses oder jenes, was man außerdem
 obliged be-INF could this or that what one besides
 nicht zu tun gebraucht hätte (etwa in die Kirche,
 NEG to do-INF need-PPP(ge) have-SBJV.PST about in the church
 zum Abendmahle gehen u. dgl.), um des bloßen
 to.the supper go and the.like for the-GEN mere-GEN
 guten Beispieles zu tun.³⁰⁹
 good-GEN example-GEN to do
 'One very often deliberates about this duty in a wrong manner, as if one could be obliged to do something which was not necessary besides to do (e.g. to go to church or the supper) just for the sake of being a good example.'
- (388) er hätte nur die Regungen der eigenen Brust zu
 he have-SBJV.PST only the emotions the-GEN own chest to
 besingen gebraucht³¹⁰
 sing need-PPP(ipp)

307 Allgemeine Literatur Zeitung 57 20. Februar 1789, p. 456.

308 *Neue Bibliothek der schönen Wissenschaften und der freyen Künste* volume 53/1: *Adalbert der Wilde* by Friedrich August Müller. Leipzig Dyckische Buchhandlung (1794), p. 281.

309 Johann Gottlieb Fichte, *Das System der Sittenlehre* volume II, Leipzig Meiner (1798), p. 716.

‘He only needed to sing about the emotions in his chest.’

- (389) Eine blendende Art der Darstellung wäre mir
 a splendid kind the-GEN description-GEN be-SBJV.PST me
 wahrscheinlich gelungen, wenn nur nichts hinter derselben zu
 probably succeed-PPP if only nothing after it to
 seyn gebraucht hätte,³¹¹
 be-INF need-PPP(ge) have-SBJV.PST

‘I would have managed to deliver a splendid kind of description if it had not been necessary to write something after it.’

All of the occurrences listed above involve circumstantial modality. This does not seem to be obvious. The first two examples (385) and (386) are taken both from a review of a theatre play or novel, in which the reviewer criticises certain details of the work. In the investigation discussed here, *brauchen* with an infinitive complement was found with a *ge*-participle in 1789, whereas the earliest occurrence of the variant with an IPP-effect dates back no earlier than 1829. This could lead us to the conclusion that the *ge*-participle was the original form which was replaced with the IPP in the course of the 19th century. Furthermore, it appears that *brauchen* with an infinitive complement was initially restricted to *zu*-infinitives. The first example of *brauchen* with a bare infinitive complement was mentioned by Sanders (1908: 101) in the late 19th century (cf. 390):

- (390) ich hätt’ mich bloß nicht einmischen brauchen³¹²
 I have-SCJV.PST REFL only NEG barge.in-INF need-PPP(ipp)

‘It was not necessary that I barged in.’

His example is taken from a novella written by Paul Heyse, which talks about the life in the mountains around the Watzmann in Southern Bavaria. This occurrence of *brauchen* is part of a longer report told by the character Sepp, which is intended to reflect the spoken language of the local people. However, it certainly does not correspond to the actual language use in this region. Nevertheless, this example indicates that *brauchen* with bare infinitive complement was considered as a feature of spoken language.

The use of *brauchen* with a bare infinitive complement is not mentioned in grammars until the late 19th century. On the one hand, Wustmann (1896: 57), in

³¹⁰ Heine 2, 307, [as cited in Sanders (1908, 101)].

³¹¹ Edmund Jörg und Franz Binder, *Historisch-politische Blätter für das katholische Deutschland* volume 26, München (1870), p. 237.

³¹² Paul Heyse, *Auf der Alm* in: *Neue Novellen* volume 4, (pp.385–455) Berlin: Wilhelm Hertz (1862), p. 447.

a derogatory way, considers *brauchen* without *zu* as *gemeines Berliner Zeitungsdeutsch* ‘Common Newspaper German of Berlin’. In a later edition, Wustmann (1908: 61) chooses an even more drastic terminology: *Gassendeutsch* ‘Street-German’. On the other hand, Sanders (1908: 101) observes in a less subjective way that *brauchen* is occasionally used with a bare infinitive. Based on data from the late 19th century, he notices that *brauchen* can occur with a bare infinitive complement, in particular in spoken language. Interestingly, the example given above (390) involves an IPP which according to some grammarians at that period should only be used with verbs that take bare infinitive complements. Until today, the IPP is a property which predominantly occurs with verbs that select a bare infinitive complement. According to the scarce data presented here, the suspicion arises that the emergence of bare infinitive complements with *brauchen* is a consequence of the increasing use of the IPP. Obviously, the ability to realise an IPP acts as a threshold between auxiliary-like verbs and lesser grammaticalised verbs: once a verb with *zu*-infinitive develops a meaning that is close to the core-class of IPP verbs, as defined by Schmid (2000: 328), it is likely to acquire the IPP-effect as well. As soon as it has adopted this new property, there are two options. Either it drops the infinitival particle *zu* and begins to subcategorise bare infinitive complements, such as *brauchen*, or it loses the ability to realise its participle as IPP, as is exemplified in the case of many other verbs that used to exhibit the IPP for a certain period such as *wissen* or *pflügen*. A more comprehensive collection of verbs which are observed with the IPP-effect is provided by Sanders (1908: 222) and Aldenhoff (1962), as is illustrated in Section 2.1.1.2.

In any case, all of these speculations require a systematic survey of a significant amount of data from the 18th and the 19th centuries. The absence of *brauchen* with bare infinitives in the data discussed could be due to the selection of texts. It may turn out that it was already used much earlier, or that it was only used in the spoken language. Moreover, it is conceivable that grammarians prior to Sanders (1908: 101) and Wustmann (1908: 61) ignored *brauchen* with bare infinitive because it was considered non-standard language. Yet, the latter conclusion is not very plausible, as Langer (2001) has demonstrated that grammarians of the 18th and the 19th centuries had a particular interest to fight against “bad language”. Accordingly, they were well informed about recurring non-conform uses of language.

Turning to the syntactic characteristics, it has been mentioned that the six traditional modal verbs take bare infinitive complements. Some grammarians, such as Jäger (1968: 332), only consider the use of *brauchen* with *zu*-infinitive complements acceptable. By contrast, Folsom (1968: 328) argues that *brauchen* without *zu* is fully acceptable. Other grammarians, such as Sanders (1908: 101) recommend dropping the infinitive particle *zu* in certain environments: (i) whenever

the infinitive complement is topicalised, and (ii) in cases in which *brauchen* itself is realised as a *zu*-infinitive, it is sufficient to use one single infinitive particle *zu*. This recommendation corresponds roughly to the one made by the popular Duden grammar edited by Drosdowski et al. (1995: 395 Fn.1), which is based on the claim made by the same author in an earlier study, cf. Gelhaus (1969: 320).³¹³

Likewise, the highly respected Austrian writer Karl Kraus argued in the early 20th century that *brauchen* without *zu* should not be considered as incorrect. Furthermore, he notices that this option is even more appropriate in environments with more than one infinitive particle *zu*.³¹⁴

Turning to the investigation of the DeReKo corpus, it turns out that *brauchen* occurs with bare infinitives even in written language. Further instances have been found in works of fiction of high renown, such as the pattern (398) taken from Franz Kafka's *Verwandlung* ('The Metamorphosis'). Note that none of the examples (391)–(401) refers to spoken language or reported speech, except example (392) taken from Götzke and Mitka (1939: 411). The occurrences can be divided into four classes, according to the type of environments in which they occur. First of all, (i) *brauchen* with bare infinitive complements can be used if its infinitive complement is topicalised (cf. 391–394). Secondly, (ii) the particle *zu* is occasionally omitted in contexts in which the phonetic string *zu* occurs adjacent to the infinitive complement such as *allzu* 'too' (cf. 394) or *zur* 'to.the' (cf. 396) or *zugeben* 'admit' (cf. 401). Furthermore, (iii) *brauchen* without *zu* can be found in verb clusters that consist of at least three verbs (cf. 395–398). And finally, (iv) there are instances of *brauchen* with bare infinitive complements that exhibit the IPP (cf. 398–401). In some cases, these factors bundle: Topicalisation and multiple

313 An extract from the original quotation:

Aus gründen des Wohlklangs (...*zu tun haben* statt ...*zu tun zu haben*) und in der Emphase (*Wundern braucht man sich nicht!* wird *brauchen* auch standardsprachlich ohne *zu* vorgezogen)

English translation [J.M.]: *brauchen* is preferred in standard language without *zu* for reasons of euphony (...*zu tun haben* instead of ...*zu tun zu haben*) and in topicalisations (*Wundern braucht man sich nicht!* instead of *brauchen*).

314 Karl Kraus *Die Fackel, März 1925* München: Kösel Verlag 2nd edition, p.265–266. The full quotation is as follows:

An und für sich ist *brauchen* ohne *zu* keineswegs falsch – das wurde nie behauptet –, es gibt Fälle, in denen es sogar vorzuziehen ist, eben wenn sich die *zu* häufen oder wo eine mehr mundartliche Färbung oder Veranschaulichung des abgekürzten Vorgangs intendiert ist.

zu (cf. 394), clusters of verbs and IPP (cf. 398 and 400), multiple *zu* and IPP (cf. 401). As most of these examples involve a certain degree of morphological and syntactic complexity, most native speakers would not realise that these patterns do not correspond to the rules of normative grammars. In order to identify the influence of these four environments, they should be investigated with respect to other verbs that select *zu* infinitive complements. It appears that such verbs do not drop the *zu*-particle that easily.

- (391) Wandern braucht ihr nicht zum Süden, weil ihn ihr
wander-INF need you NEG to.the south because him her
Gesang euch bringt.³¹⁵
song you brings
'You do not need to wander to the South, as her song will bring it to you.'
- (392) Ja, totschlagen brauch' ich ihn nicht, er verdient's gar
yes strike.dead-INF need I him NEG he merits.it INTN
nicht³¹⁶
NEG
'Yes, I do not need to strike him dead, he does not merit it.'
- (393) Politiker müssen sich Kritik gefallen lassen, beschimpfen
politicians must REFL criticism please-INF let-INF insult-INF
oder beleidigen lassen brauchen sie sich nicht.³¹⁷
or offend-INF let-INF need they REFL NEG
'Politicians have to be able to deal with criticism, but they do not need to acquiesce to insults and offenses.'
- (394) Allzu sehr grämen brauchen sich die Viertäler angesichts der
all.too much worry-INF need REFL the Viertäler regarding the
Tabellenlage allerdings nicht.³¹⁸
table.position however NEG
'However, the team from Viertel do not need to worry regarding their position in the table.'

³¹⁵ Friedrich Rückert, *Nachklang* in *Gedichte* (1841), p. 299. First published in *Morgenblatt für gebildete Stände* N° 243, Mittwoch 10. October 1821 (1821).

³¹⁶ Willibald Alexis, *Der Werwolf* Berlin: Otto Janke, (1894) part I, chapter 9, p.89. First published in 1848.

³¹⁷ DeReKo: RHZ07/FEB.00452 Rhein-Zeitung, 01/02/2007.

³¹⁸ DeReKo: RHZ08/MAR.20777 Rhein-Zeitung, 25/03/2008.

- (395) Sei großmütig, da die Strafe in Deiner Hand liegt und
 be-IMP noble as the punishment in your hand lies and
 Du nur mich lange auf einen Antwortsbrief warten lassen
 you only me long for a answer.letter wait-INF let-INF
 brauchst.³¹⁹
 need
 ‘Be noble, as the punishment lies in your hands and you only need to keep me waiting
 a long time for an answer.’
- (396) Aber was sicherlich nicht zur Diskussion gestellt werden
 but what certainly NEG to.the discussion put-PPP PASS.AUX-INF
 braucht, ist die Tatsache, daß viele Dichter und Schriftsteller
 needs is the fact that many poets and writers
 vom 19. Jahrhundert bis zum heutigen Tag das Verb
 from.the 19 century until to.the present day the verb
 ‘brauchen’ mit reinem Infinitiv anwenden.³²⁰
 need with bare infinitive use
 ‘Yet, what certainly does not need to be discussed is the fact that many poets and
 writer from the 19th century until the present day use the verb ‘brauchen’ with a bare
 infinitive complement.’
- (397) Die Erkundungen ergaben, dass zwei Stollen nicht verfüllt
 the explorations yielded that two adits NEG fill-PPP
 werden brauchten.³²¹
 PASS.AUX-INF needed
 ‘The explorations have yielded that two adits did not need to be closed.’
- (398) [...] so hätte noch keineswegs die Mutter
 so have-SBJV.PST still by.no.means the mother for
 für sie eintreten müssen und Gregor
 her advocate-INF must-PPP(ipp) and Gregor have-SBJV.PST
 hätte doch nicht vernachlässigt werden brauchen.³²²
 PART NEG neglect-PPP PASS.AUX-INF need-PPP(ipp)
 ‘Accordingly, the mother would not have by no means to have advocate her and Gregor
 would not have needed to be neglected.’
- (399) Dabei hätte es soweit nicht kommen brauchen.³²³
 though have-SBJV.PST it so.far NEG come-INF need-PPP(ipp)

319 Droysen’s letter to Heydemann 20th June 1840, as cited in Götzke and Mitka (1939: 411).

320 August Scaffidi-Abbate ‘*Brauchen*’ mit folgendem Infinitiv, in: Muttersprache 83 (1973), p. 5

321 DeReKo: BRZ07/JAN.17470 Braunschweiger Zeitung, 03/01/2007.

322 Franz Kafka, *Die Verwandlung*, (1916) p. 179 l. 3.

'Though, it was not necessary that this happened.'

- (400) Eigentlich hätten die Aachener Bosch gar nicht gehen
 actually have-SBJV.PST the Aachenian Bosch INTN NEG go-INF
 lassen brauchen, denn sein dortiger Vertrag sah eine
 let-INF need-PPP(ipp) as his local contract envisage a
 Auflösungsklausel frühestens für 2014 vor.³²⁴
 cancellation earliest for 2014 before

'Actually, there was no need for the Aachenians to let Bosch go as his local contract did not envisage a cancellation before the year 2014.'

- (401) Dass er seine Bütt' erst am Vortag geschrieben hat,
 that he his vat.speech only at.the previous.day written has
 hätte er nicht offen zugeben brauchen.³²⁵
 have-SBJV.PST he NEG publicly admit-INF need-PPP(ipp)

'It was not necessary that he admitted that he only wrote his polemic on the previous day.'

Interestingly, most of the occurrences were found in newspapers from Eastern Austria and Rhineland. Pfeffer (1973: 92) already noticed that *brauchen* with bare infinitives is frequent in the spoken language of Austria and absent from the one in Switzerland. Based on some earlier data collected by Pfeffer, Kluempers (1997) comes to a similar conclusion. While these uses can be easily found for the 20th century, it is not obvious when this pattern emerged. Sanders (1908: 101), Götzke and Mitka (1939: 411) and Scaffidi-Abbate (1973: 5) provide a couple of occurrences taken from literature of the 19th century. However, a number of them are taken from direct speech or dialogues that should reflect the use of the spoken language, such as (392). The earliest examples of *brauchen* in genuine written language that select bare infinitive complements are from the early 19th century. In the *Trübners Deutsches Wörterbuch*, Götzke and Mitka (1939: 411) provide two interesting occurrences: one involving a topicalisation (cf. 391) of 1821 and another one that contains a verb cluster (cf. 395) of 1840. The claim put forth by Götzke and Mitka (1939: 411) that *brauchen* without *zu* can be already found in the collection of tales edited by the Brothers Grimm could not be confirmed with the support of electronic corpora: such forms could neither be found in the version provided by the DeReKo corpus nor in the version accessible in the *Digitale Bibliothek Deutscher Klassiker*.³²⁶

323 DeReKo: RHZ10/APR.12082 Rhein-Zeitung, 22/04/2010.

324 DeReKo: NUN10/JUN.01746 Nürnberger Nachrichten, 18/06/2010

325 DeReKo: NON10/JAN.05921 Niederösterreichische Nachrichten, 18/01/2010

326 <http://klassiker.chadwyck.co.uk/deutsch/home/home>, last access 9th July 2012.

These examples show that there are environments in which a native speaker would not notice that *brauchen* is used without the infinitive particle *zu*. By contrast, a number of speakers would not consider *brauchen* with a bare infinitive complement as prestige Standard German, as soon as it occurs in other environments than those four discussed above.

As has been illustrated on various occasions, *brauchen* has mostly adopted patterns that its predecessor *dürfen* had already established. In this respect, it is fairly astonishing that *dürfen* can be found with *zu*-infinitives in its old interpretation in the early 16th century, as Scaffidi-Abbate (1973: 26) demonstrated, referring to examples provided by the DWB (p. 1722), (cf. 402). This is fairly unexpected, as all of the preterite present verbs already selected bare infinitive complements for several centuries. Does this mean that there are independent semantic reasons that prescribe the selection of the *zu*-infinitive?

- (402) nun sprichstu waz darf ich das zu biten, so ich doch daz on
 now talk.you what need I that to beg-INF as I yet that and
 daz hab, dan ich bin reich³²⁷
 that have since I am rich

‘Now you talk, what necessitates me to beg for that? As I have this and that, as I am rich.’

‘Now you talk, why do I need to beg for that? As I have this and that, as I am rich.’

Note that the configuration in example (402) is reminiscent of the ones in (369) and (371): It contains a causal use of the *wh*-pronoun *waz* and a verb that expresses a need. Similar examples with causal *was* and *thurfan* are already documented for the Old High German Tatian, as the example provided by Scaffidi-Abbate (1973: 25) illustrates.

- (403) Uuaz thurfun uuir noh nu urcundono³²⁸
 what need we yet now witnesses

‘Why do we now yet need witnesses?’

This observation could be the crucial hint for an alternative explanation for the fact that *dürfen* could occur next to *zu*-infinitives.

Apart from the selection of bare infinitive complements, *brauchen* exhibits a further characteristic typical of the six traditional modal verbs. Just like volitional *mögen*, raising *wollen* and *dürfen* in the Early New High German period, *brauchen* with an infinitive is restricted to negative environments. This has often been observed. Crucially, as Paul (1897: 79) already pointed out, this property also affected

³²⁷ Geiler Keiserberg *sünden des munds*, 84a (1518), as cited in the DWB.

³²⁸ Tatian, 191,2 (830) as cited in Scaffidi-Abbate (1973: 25).

the new transitive uses of *brauchen*. As soon as transitive *brauchen* referred to a need rather than a usage, it was restricted to negative polar contexts. This is of particular interest, as the transitive use of the need related interpretation lost this property in the course of time, whereas *brauchen* with an infinitive complement continues to avoid positive environments. Bech (1951: 14), Kolb (1964: 73) and Lenz (1996: 399) have demonstrated that *brauchen* in most respect adopted the function of the original need verb *dürfen*, including its negative polar orientation. Folsom (1968: 325) provides a comprehensive list of items that license a suitable negative polar environment for *brauchen*: explicit negation, particles that imply some sort of negation *nur* ‘only’, *kaum* ‘hardly’ and *erst* ‘(temporal) only’, subordinative conjunctions *ohne dass* ‘without that’ and polarity and *wh*-questions.

However, there are rare instances of *brauchen* that do not occur in negative polar environments. First of all, the negative polarity of *brauchen* poses a particular challenge for language learners. Due to overgeneralisation, they sometimes assume that *brauchen* can also be used in positive contexts, as the examples produced by a L1-learner (404) and by the Turkish L2-learner Sevinc (405) provided by Vainikka and Young-Scholten (1994: 289) illustrate. Kürschner (1983: 193) discusses more positive examples of *brauchen* from L1-acquisition.

(404) doch Papa das brauchst Du kaufen.³²⁹
 PART daddy that need you buy-INF
 ‘Oh yes, daddy you need to buy this.’

(405) Jetzt brau Wohnungsamt fragen.³³⁰
 Now need housing.authority ask-INF
 ‘Now, I need to ask the housing authority.’

Folsom (1968: 326) and Pfeffer (1973: 88) have moreover collected relevant instances produced by native speakers of German. Whereas Folsom provides examples from the 19th century, Pfeffer discusses an example from Contemporary Spoken German (cf. 406). As Roland Schäfer (pers. commun.) has pointed out to me, *brauchen* is occasionally used in positive environments (cf. 407–408). According to his evaluation, this appears to be a regional phenomenon of the spoken language in North Rhine-Westphalia.

(406) Es brauchen immer so die sehr schwierigen Sachen zu sein³³¹
 it need always so the very difficult things to be-INF
 ‘It always has to be the very difficult things.’

329 Utterance heard in a bookstore in Berlin in the year 2000, when a small child argued with his father.

330 As quoted in Vainikka and Young-Scholten (1994: 289).

331 As quoted in Pfeffer (1973: 88).

- (407) Jeder Kinositzer braucht ein eigenes Bild berechnet zu
 each cinema.sitter needs a proper picture calculate-PPP to
 bekommen, da die Abstände vom Bild der einzelnen
 get-INF as the distances from.the picture the-GEN single-GEN
 Besucher viel zu gravierend sind.³³²
 visitor-GEN much too serious are

'It is necessary that each cinema goer gets an individually calculated picture as the distances from the picture of each visitor are too varied.'

- (408) Jetzt brauch ich meine Pillen nehmen, und dann geh ich ins
 now need I my pills take and then go I in.the
 Büro.³³³
 office

'Now, I just need to take my pills and than I'll go to the office.'

There is evidence that related patterns were already common in the 18th century. However, as this pattern is acceptable for speakers who do not consider examples (ex: BrauchenSachenZuSein)–(ex: BrauchPillenNehmen) as grammatical, it appears that the environment obviously still has properties of an negative polarity context in German, possibly due to the presence of the *wh*-pronoun in the zero relative clause.

- (409) so weiß der Patriach, was er zu wissen braucht, mehr als er
 so knows the patriarch what he to know needs more than he
 braucht.³³⁴
 needs

'As a consequence, the patriarch knows what he needs to know, even more than he needs.'

Since Folsom and Pfeffer published their investigations, *brauchen* does not seem to have undergone any dramatic change in Standard German. Even if there was evidence that *brauchen* could spread to positive environments as well, it remained confined to negative polar distribution until the present day. And this is one of the big mysteries: Why did the new transitive use of *brauchen* lose its negative polar behaviour, whereas *brauchen* with an infinitive is still confined to negative environments after two hundred years?

332 Eternal thanks to Roland Schäfer, who provided me this example found on 26th of January 2011 on the web:

<http://forum.golem.de/kommentare/audio-video/roger-ebert-us-filmkritiker-erklaert-den-3d-film-fuer-tot/was-3d-vor-alle-m-fehlt/48624,2629841,2629841,read.html#msg-2629841>

333 Eternal thanks to Roland Schäfer, who supplied me with this example produced by a 70 year old speaker from Southwestern Phalia. on 28th of March 2011.

334 Gotthold Ephraim Lessing, *Nathan der Weise*, 1. Aufzug, 5. Auftritt (1779).

Apart from the selection of bare infinitives and the preference for negative polar environments, *brauchen* has another property that is typical of the six traditional modal verbs. As Folsom (1968: 324) and Askedal (1997a: 57) have demonstrated, *brauchen* can select VP-anaphora that refer to infinitives which are embedded by a traditional modal verb. Such patterns are well documented in the DeReKo corpus (cf. 410–411).

- (410) Das heißt, man kann eine direkte Patenschaft übernehmen,
that means one can a direct sponsorship overtake-INF
braucht es aber nicht?³³⁵
need VPANA but NEG

‘Does this mean that one can adopt a sponsorship, but one does not need to?’

- (411) Dass Chelseas Spieler-Trainer Gianluca Vialli seinem Captain
that Chelsea-GEN player-manager Gianluca Vialli his Captain
selbst diesmal Nachsicht versprochen hat, müsste eigentlich
even this.time clemency promised have should actually
verwundern. Braucht es aber nicht. Vialli und Wise sind
surprise-INF need VPAN but NEG Vialli and Wise are
Freunde.³³⁶
friends

‘It should actually surprise us that the playing manager Gianluca Vialli was even lenient towards his captain this time. However, it doesn’t need to. Vialli and Wise are friends.’

As it turns out, circumstantial *brauchen* behaves exactly like *müssen* with respect to negation. Accordingly, it exhibits all of the essential raising diagnostics that were introduced in Section 2.2.1.3 and 2.2.2.3. In the corpus, it is found with the non-referential subject *es* ‘it’ (cf. 412–413) and with *de dicto* interpretations of quantifying NPs (cf. 414). It should not be relevant here whether *eines* is used as an indefinite pronoun or as a numerical determiner, as Carpenter (1998: 87) has pointed out that numerical determiners behave like ordinary existential quantifiers. Finally, the subject referent in example (415) is not the target on which the obligation is imposed, as we would expect for a control pattern.

- (412) Es braucht nicht überall Weisswürste und Bier oder
it need NEG everywhere white.sausage and beer or
«Züri-Gschnätzlets» zu geben.³³⁷
Züri-Gschnätzlets to give-INF

335 DeReKo: M00/DEZ.79640 Mannheimer Morgen, 20/12/2000.

336 DeReKo: 99/FEB.03243 Zürcher Tagesanzeiger, 05/02/1999.

'It isn't necessary that Weisswurst, beer or Züri-Gschnätzlets is available everywhere.'

- (413) Vor dem Winter braucht es den Eichhörnchen nicht bang
before the winter need it the-DAT squirrel-DAT NEG afraid
zu werden.³³⁸
to become-INF

'Before winter, the squirrel doesn't need to be afraid.'

- (414) Von jeweils zwei Geschwistern braucht nur eines Eintritt zu
of each two siblings need only one entrance.fee to
bezahlen.³³⁹
pay-INF

'Only one out of two siblings has to pay the entrance fee.'

- (415) Bei Grippe muss unter allen Umständen das Bett gehütet
with influenza must under all circumstances the bed tend-PPP
werden – es braucht nicht das eigene zu sein.³⁴⁰
PASS.AUX-INF it need NEG the own to be-INF

'In case of influenza, it is necessary to stay in bed under any circumstance – it does not need to be the own one.'

Finally, raising predicates are transparent with respect to voice. If *brauchen* was a control verb, the target of the obligation would be expected to always be the subject referent, as any control verb determines the main semantic relations by means of assigning thematic roles. Involving different subjects, the sentences (416a) and (416b) should accordingly refer to different states of affairs. However, they differ: In the active example (416a) the subject is the underlying agent argument *der Reinhold*, whereas the subject is identified with the underlying theme argument *der Nanga Parbat* in the passivised instances. If *brauchen* involved a proper subject argument, the obligation should be imposed on *Reinhold* in (416a) and on the *Nanga Parbat* in the passivised example (416b). This is not the case, so *brauchen* must involve a raising pattern.

- (416) a. Der Reinhold braucht den Nanga Parbat nicht ohne
the Reinhold must the-ACC Nanga Parbat NEG without
Sauerstoffgerät (zu) bezwingen.
oxygen.apparatus to conquer

'Reinhold has to conquer the Nanga Parbat without oxygen mask.'

337 DeReKo: E00/JAN.01750 Zürcher Tagesanzeiger, 20/01/2000.

338 DeReKo: RHZ96/NOV.14124 Rhein-Zeitung, 22/11/1996.

339 DeReKo: NON09/MAR.11321 Niederösterreichische Nachrichten, 18/03/2009.

340 DeReKo: NUZ06/FEB.03100 Nürnberger Zeitung, 27/02/2006.

- b. Der Nanga Parbat braucht vom Reinhold nicht ohne
 the-NOM Nanga Parbat must by.the Reinhold NEG without
 Sauerstoffgerät bezwungen (zu) werden.
 oxygen.apparatus conquer-PPP to PASS.AUX-INF
 'The Nanga Parbat has to be conquered by Reinhold without oxygen mask.'

Just as *müssen* in the scope of negation, negative polar *brauchen* can act as a quantifier over individuals, yielding a quantificational interpretation in the sense of Carlson (1977: 119) and Brennan (1993: 96). In example (417), *nicht müssen* serves as a negated universal quantifier over individuals ($\neg\forall$). It expresses that in the set of people with cancer there is at least one person whose fate is not hopeless. The following examples (418)–(423) behave in parallel way.

- (417) Ein Leben mit Krebs braucht nicht hoffnungslos zu sein.³⁴¹
 a life with cancer need NEG hopeless to be-INF
 'A life with cancer does not need to be hopeless.'
- (418) Was umweltfreundlich ist, braucht noch lange nicht
 what eco.friendly is need still long NEG
 menschenfreundlich zu sein.³⁴²
 charitable to be-INF
 'What is ecologically friendly, does not need to be charitable.'
- (419) Und der Prager Komponist Petr Eben hat vorgeführt, daß Musik
 and the Prager composer Petr Eben has demonstrated that music
 im Riesenraum nicht zwangsläufig plakativ zu sein
 in.the giant.space NEG inevitably blatant to be-INF
 braucht.³⁴³
 needs
 'And Prague's Composer Petr Eben has demonstrated that music in the giant space does not need to be blatant.'
- (420) Nicht jeder, der vielleicht ein guter Lebenshelfer ist, braucht
 NEG everyone who maybe a good life.helper is needs
 auch ein guter Schriftsteller zu sein.³⁴⁴
 also a good writer to be-INF
 'Not everybody who is maybe good at giving advise need to be a good writer.'

341 DeReKo: A98/MAR.13892 St. Galler Tagblatt, 06/03/1998.

342 DeReKo: N93/MAR.07932 Salzburger Nachrichten, 03/03/1993.

343 DeReKo:N93/OKT.39664 Salzburger Nachrichten, 30/10/1993.

344 A00/APR.27086 St. Galler Tagblatt, 20/04/2000.

- (421) Teurere Produkte brauchen nicht zwangsläufig besser zu sein,
 expensive products need NEG inevitably better to be-INF
 aber oft ist der höhere Preis auch ein Zeichen grösserer
 but often is the higher price also a sign bigger-GEN
 Qualität und eines besseren Services.³⁴⁵
 quality-GEN and a-GEN better-GEN service-GEN
 ‘Expensive products do not need to be inevitably better, yet, a higher price often indicates a higher quality and a better service.’
- (422) bei dieser Gelegenheit hatte er, sowohl mit sich selbst als mit
 at this occasion had he both with REFL self as with
 Serlo und Aurelien, die Frage oft abgehandelt, welch ein
 Serlo and Aurelia-DAT the question often dealt which a
 Unterschied sich zwischen einem edlen und vornehmen
 circumstance REFL between a noble and distinguished
 Betragen zeige, und inwiefern jenes in diesem, dieses aber
 conduct shows and to.what.extent this in that that yet
 nicht in jenem enthalten zu sein brauche.³⁴⁶
 NEG in this contain-PPP to be-INF need-SBJV.PRS
 ‘On this occasion, he had often discussed the question with himself on the one side and Serlo and Aurelien on the other side to what extent there is a difference.’
- (423) In der Sprache der Kinder und der
 in the language the- children-GEN and the-GEN
 Geisteskranken erscheint ein Inf., der nicht
 mentally.ill.persons-GEN appears an infinitive that NEG
 elliptisch zu sein braucht, als allgemeine Form, die die
 elliptically to be-INF needs as general form that the
 anstrengende Ausprägung bestimmter logischer Beziehungen
 exhausting specification certain-GEN logical-GEN relation-GEN
 nicht erfordert.³⁴⁷
 NEG requires.
 ‘In the language of children and mentally ill persons, an infinitive appears that does not need to involve an ellipsis, being a general form that does not require the exhausting specification of certain logical relations.’

³⁴⁵ DeReKo:97/JUN.09921 St. Galler Tagblatt, 17/06/1997.

³⁴⁶ DeReKo: GOE/AGM.00000 Goethe: Wilhelm Meisters Lehrjahre, [Roman], (Erstv. 1795–1796), p. 352.

³⁴⁷ Behaghel, Otto *Deutsche Syntax II*, (1924) p. 364.

As example (422), taken from the 18th century, shows, the quantificational interpretations of *brauchen* seem to have already been available right after the period when it had acquired the infinitive complement.

2.2.9.5 Raising directionals with event modification

As was shown by Welke (1965: 15), Folsom (1968: 323), Kürschner (1983: 194), Aske-dal (1997a: 57) and Szumlakowski (2010), *brauchen* is also found with verbless directional phrases. In this respect, it behaves exactly like *müssen*. As both examples involve inanimate subjects, an analysis in terms of ellipsis does not seem to be very likely, as was illustrated in Section 2.2.1.

- (424) Das Fahrrad braucht nicht zum TÜV.³⁴⁸
 the bike need NEG to.the TÜV
 ‘The bike does not need to be sent to the Technical Control Board’
- (425) Dieser Wagen paßt auf Anhieb, er braucht nicht in die
 the car fit at first.go he need NEG in the
 Änderungsschneiderei.³⁴⁹
 alteration.tailor
 ‘This car fits at first go, it doesn’t need to be send to the alteration tailor.’

Like its counter part with an infinitive complement, *brauchen* continues to be a negative polarity item in this use. In this regard, it very much resembles the negative polar uses of the raising pattern of *wollen* and the volitional use of *mögen*, which continue to be negative polar whenever they are employed with a verbless directional phrase complement.

2.2.9.6 Subject-to-object raising infinitives

At least in some varieties such as Viennese, *brauchen* can be used as a subject-to-object raising verb. In this use it imposes strict selectional restrictions on the infinitive, which has to be a stative locative verb such as *liegen* ‘lie’, *sitzen* ‘sit’ or *stehen* ‘stand’. In that respect, it is very similar to other subject-to-object raising verbs such as *haben* and the relinquative use *lassen*, and the subject-to-subject raising verb *bleiben*, as has been illustrated by Maché and Abraham (2011: 260):

- (426) I brauch di da jetzt net deppat umanand sitzn.
 I need you-ACC there now NEG stupid around sit-INF
 ‘It doesn’t help me if you sit around here now.’

348 DeReKo: RHZ09/JAN.18261 Rhein-Zeitung, 24/01/2009.

349 DeReKo: RHZ97/AUG.13358 Rhein-Zeitung, 23/08/1997.

Interestingly, the subject-to-object raising pattern is negative polar just like the subject-to-subject raising pattern with *zu*-infinitive is.

2.2.9.7 Raising infinitives with clause modification

It is a matter of debate to what extent *brauchen* can exhibit an epistemic interpretation. On the one hand, some authors, e.g. Folsom (1968: 328), Kürschner (1983: 192) and Öhlschläger (1989: 8), contest that this type of interpretation is acceptable. On the other hand, Ehlich and Rehbein (1972: 340), Raynaud (1977: 22), Takahaši (1984: 21), Zifonun (1997: 1278), Askedal (1997a: 62) and Kluempers (1997: 101) provide examples from corpora which they consider to be epistemic. At the same time, most of them concede that this type of interpretation occurs fairly rarely with *brauchen*, unlike Takahaši (1984: 21).

In the past decades, a couple of instances of *brauchen* with an infinitive complement have been collected that are candidates for an epistemic interpretation. Takahaši (1984: 21) discusses (427), Vater (2010: 108) considers *brauchen* in (428) as epistemic and Folsom (1968: 323) provides (429) and (430). Interestingly, he does not notice that they can plausibly be interpreted in an epistemic way. It was only Takahaši (1984: 21) who noticed that they can be interpreted epistemically. Likewise, Askedal (1997a: 62) remarks that Folsom's example (429) is most likely to be an epistemic instance of *brauchen*.

- (427) Das braucht nicht der Fall zu sein.³⁵⁰
 that need PART NEG the case to be-INF
 'That doesn't really have to be the case.'
- (428) Das braucht nicht zu stimmen.
 this need NEG to be.right-INF
 'That doesn't have to be correct.'
- (429) Es braucht nicht unbedingt ein Irrtum des Computers
 it need NEG necessarily a error the-GEN computer-GEN
 gewesen zu sein.
 be-PPP to be-INF
 'It does not need to have been an error by the computer.'
- (430) Ebenso braucht nicht unbedingt sie die Eintrittskarte in Iesolo
 likewise need NEG necessarily she the ticket in Iesolo
 verloren zu haben.
 lose-PPP to have-INF
 'Likewise, it does not need to be her who has lost the ticket in Iesolo.'

350 H. Gipper, *Sprachwissenschaftliche Grundbegriffe und Forschungsrichtungen*, 1978.

Do the instances given above indeed involve epistemic modal operators? As far as their distribution is concerned, these examples behave like typical epistemic modal verbs. Such instances of *brauchen* embed predicates that refer to states that cannot be changed (cf. 427–428) and predicates that refer to events in the past (cf. 429–430), just as genuine epistemic modal verbs do. Moreover, *brauchen* in the examples above is subject to the CoDeC: The speaker labels the embedded proposition as a proposition that is not part of his confirmed knowledge. Thus, they are not compatible with the assertion of the same proposition.

As the investigation of the DeReKo corpus has revealed, the number of corpus examples for epistemic *brauchen* is fairly limited. The retrieval strategy used is as follows. In her own small corpus study investigating 6000 modal verbs, Raynaud (1977: 22) found out that 90 % of the epistemic modal verbs embed the stative predicate *sein*. Furthermore, Heine (1995: 23) demonstrates that infinitive perfect complements strongly favour an epistemic interpretation. According to the frequencies documented by Ruoff (1981), the stative predicates *sein* and *haben* make up together almost 50 % of the verbs used in his corpus. Thus, if *brauchen* does not occur in an epistemic interpretation with any of these stative predicates, it is not very likely that it will occur as an epistemic modal verb at all.³⁵¹ The study presented here has focused on instances of *brauchen* that co-occur with the negation *nicht* and the verbs *sein* or *haben*. Both verbs can either occur as stative predicates or perfect tense auxiliaries which is of course part of the infinitive perfect.

The first query for *brauchen* that selects the complement *zu haben* yielded 768 hits. Far more than 80 % of these occurrences were variations of the pattern *nicht Angst zu haben brauchen* ‘it is not necessary to be afraid’, in which the noun *Angst* can be replaced with a semantically related noun such as *Sorge* ‘worry’, *Befürchtungen* ‘fear’, *Respekt* ‘respect’, *Ekel* ‘disgust’, *Scheu* ‘timidity’, *schlechtes Gewissen* ‘bad conscience’. Of course, all of these examples do not come into consideration for an epistemic interpretation. In the most typical case, they are employed as direct or indirect advise.

Surprisingly, there are only two occurrences out of 768 that display a clear epistemic interpretation: (431) and (432). Apart from them, there are just a couple of cases that could turn out to be epistemic as well. Yet, the contexts are too ambiguous to determine the precise interpretation.

³⁵¹ The investigation has been carried out on April 22nd 2010. The first query `&brauchen /s0 "nicht" /s0 zu haben` yielded valid 768 results and the second query `&brauchen /s0 "nicht" /s0 zu sein` yielded valid 1683 results.

Of course, this query does not extract all of the negative polar interpretations of *brauchen*. But as *nicht* is by far the most frequent negative operator, this study has ignored the lesser frequent ones for the sake of simplicity.

- (431) Was den Ort Xanten als Ort der Sage betrifft, so ist
 what the village Xanten as location the-GEN myth concerns so is
 Norbert Lönnendonker der Auffassung, dass das Santen
 Norbert Lönnendonker the-GEN opinion that the Santen
 des Nibelungenliedes nicht am Niederrhein gelegen zu
 the-GEN Nibelungenlied-GEN NEG at.the Lower.Rhine lie-PPP to
 haben braucht³⁵²
 have-INF needs

‘As for Xanten as the location of the myth, Norbert Lönnendonker believes that the village Santen appearing in the Nibelungenlied was not necessarily located at the Lower Rhine.’

- (432) Wir haben die Telekom längst gebeten, vor Ort
 We have the Telekom long.ago asked at place
 nachzusehen. Das braucht Herr Kunz gar nicht gemerkt zu
 after.to.look-INF this need Mister Kunz INTN NEG notice-PPP to
 haben, weil der Techniker dafür nicht unbedingt
 have-INF because the technician therefore NEG necessarily
 ins Haus muss³⁵³
 into.the house must

‘We already asked the Telekom company to check his connection long ago. Mister Kunz may not necessarily noticed it because the technician does not need to enter the house to do so.’

As regards the other predicate that was investigated, *sein*, the situation is not much different. As the study has revealed, there are only a couple of occurrences out of 1683 that can be taken into consideration for epistemic interpretation. And in a number of instances, it is hard to determine whether *brauchen* exhibits an epistemic or quantificational reading.

- (433) gäbe es keine im weiten Sinn wirtschaftlichen,
 give-SBJV.PST it no in.the broader sense economically
 international verträglichen, umweltverträglichen und
 internationally reconcilable biocompatible and
 sozialverträglichen Technologien, so wäre die
 social.compatible technologies so be-SBJV.PST the
 industriegesellschaftliche Entwicklung in eine Sackgasse
 industry.social development into a blind.alley

³⁵² DeReKo:WPD/SSS.10575, Wikipedia – URL:<http://de.wikipedia.org>; Wikipedia, 2005.

³⁵³ DeReKo:NUN06/NOV.02580 Nürnberger Nachrichten, 23/11/2006.

geraten. Dies aber braucht unseres Erachtens nicht der Fall zu
 got this but need our consideration NEG the case to
 sein.³⁵⁴

be-INF

'If there were no technologies that were economically and internationally reconcil-
 able, biocompatible and socially compatible in the broader sense, the development
 of the industrial society would have reached a blind alley. According to our estima-
 tion, this does not need to be the case.'

- (434) Der „Outer“, wie man klar erblickt, ist nunmehr regelrecht
 the outer as one clearly sees is now downright
 verrückt. Denn was er sagt, gesteht er ein, braucht überhaupt
 crazy as what he says confesses he in need at.all
 nicht wahr zu sein³⁵⁵

NEG true to be-INF

'The outer has gone downright crazy, as one can clearly see. Since what he says
 doesn't need to be true at all anymore; as he confesses.'

It is fairly surprising that epistemic *brauchen* almost never occurs in environments in which epistemic modal verbs are usually more frequent than circumstantial modal verbs. This unexpected behaviour calls for an explanation. The instances of epistemic *brauchen* here differ from canonical epistemic modal verbs in two respects: (i) they select *zu*-infinitive complements rather than bare infinitive complements, and (ii) they are restricted to negative environments. According to Reis (2001: 307, 312 Fn. 39, 2005: 112), the canonical type of infinitive complements for epistemic verbs in German is the bare infinitive. Thus, she would expect that *zu*-infinitives inhibit an epistemic interpretation. This could explain why so few occurrences could only be found in the corpus. Accordingly, another investigation needs to be conducted in which *brauchen* selects bare infinitive complements. As they do not occur in written language so frequently, this is not a simple task.

Alternatively, the low frequency of an epistemic interpretation could be caused by the presence of a negation. As will be discussed in more detail in Section 4.10, a number of authors consider the scope of negation an environment in which an epistemic operator cannot occur. In a similar manner Askedal (1991: 9, 1997: 62), argues that this context is not a suitable context in which *brauchen* can develop an epistemic interpretation without restrictions.

In order to determine which of these approaches is the correct one, it is fruitful to take a look at *müssen* in the scope of negation. In this section, it was seen

354 DeReKo:H86/UZ3. 20139 Die Zeit, 28.03.1986.

355 DeReKo:O95/SEP.86494 Neue Kronen-Zeitung, In den Wind gereimt, 02/09/1995.

that the two necessity verbs with negation behave almost identically in semantic terms.

In case it should turn out that epistemic *müssen* in the scope of negation is equally rare with the stative complements *sein* and *haben*, the suspicion arises that it is the negation that inhibits the occurrence of epistemic interpretations. In case epistemic *nicht müssen* occurs considerably more frequently under these conditions, the infinitival particle *zu* can be held responsible for the low frequency of epistemic (*nicht*) *brauchen*.

Summing up, the position defended by Takahaši (1984), Askedal (1997a) and Reis (2001) can, by and large, be confirmed: *brauchen* is documented with an epistemic interpretation. However, the number of occurrences is much smaller than is expected. Accordingly, *brauchen* can be considered a verb with a marginally developed epistemic interpretation.

Finally, it will be shown that the epistemic reading of *brauchen* is not a recent development. There are occurrences as early as the late 19th century, as is indicated in (435):

- (435) Aber es wird nun ein Mahl als ausgemacht angenommen, das
 But it PASS.AUX now a time as agreed assumed the
 Ganze, woraus die sogenannten Fragmente sind,
 ensemble where.from the so-called fragments are
 habe nur ein einziges Buch betragen, und zwar
 have-SBJV.PRS only a single book amount and indeed
 habe es kein Größeres zu seyn gebraucht, als das
 have-SBJV.PRS it no bigger to INF need-PPP(ge) as the
 zweyte Buch von Gajus.³⁵⁶
 second book by Gajus

'It is taken for granted that the ensemble from which the so-called fragments originate only made up a single book and it does not need to have been more voluminous than Gajus' second book.'

There is yet another candidate for an epistemic interpretation which occurs in the 18th century. Despite the fact that this sentence could have been ambiguous for speakers at that period, the more likely interpretation of *brauchen* in example (436) is a teleological one: In order to survive the cold climate, the tree did not have to be too contrarious. In an epistemic interpretation, the author would rather express an assumption about the nature of the tree.

³⁵⁶ Gustav Hugo *Beyträge zur civilistischen Bücherkenntnis der letzten vierzig Jahre* Berlin: August Mylius (1829), p. 646.

- (436) Es läßt sich als ausgemacht annehmen, daß die edleren
 it let REFL as agreed assume-INF that the precious
 Obstsorten, welche niemals wild wachsend gefunden, sondern
 fruits which never wild growing found but
 allezeit unter menschlicher Wartung und Pflege erzeugt werden
 always under human attention and care produced are
 von einer gemeinen und wilden Mutter herkommen, welche
 from a common and feral mother stem which
 nachmals durch die Länge der Zeit, mit Hülfe
 later through the length the-GEN time-GEN with help
 menschlichen Nachdenkens, Kunst und Fleißes, ihre Zucht
 human-GEN reasoning-GEN, art-GEN and effort-GEN their growth
 veredelt und an Figur, Farbe, Geschmack, Geruch und Größe
 cultivated and on shape colour taste smell and size
 verändert hat. Dieser Mutterbaum, obgleich wild, hat doch, wenn
 changed has this mother.tree, even.if feral has yet if
 er unter einem milden Luftstriche stand, nicht so herbe und
 he under a mild air.flow stood NEG so harsh and
 widrig zu seyn gebraucht, wie die Aepfel, welche unsre
 contrarious to be-INF need-PPP(ge) as the apples which our
 nordischen Waelder erzeugen.³⁵⁷
 Nordic forests produce

'It is commonly assumed that the fruit trees which have never been found feral in nature but which were always produced under human attention and care originate from a common and feral mother. Consecutively, they have been cultivated their growth supported by human reasoning, art and effort. Thus, they changed their shape, colour, taste, smell and size. This mother tree didn't need to be as harsh and contrarious as the apples that grow in our Nordic forests (EPISTEMIC: This mother tree needn't have been as harsh and contrarious as the apples that grow in our Nordic forests).'

These occurrences merit closer attention for various reasons: Firstly, they involve an epistemic modal verb that is realised as a past participle. As will be shown in Section 4.2, such environments for an epistemic modal verb may seem awkward from the perspective of a contemporary native speaker of German. Most authors do not accept such patterns. However, in Spanish and French this pattern is the most natural one. Accordingly, we could assume that epistemic past participles were possible in earlier stages of German as well. And, indeed, it will be shown in Section 4.2 that there are other verbs that could be employed in an analogous way.

³⁵⁷ Peter Jonas Bergius *Von Obstgärten und deren Beförderung in Schweden* Leipzig: Gräffische Buchhandlung (1794), p. 40.

Secondly, the past participle is still realised as a *ge*-infinitive, rather than an IPP. This illustrates that the form does not play the major role in the development of an epistemic interpretation. Finally, it is interesting that *brauchen* had developed an epistemic variant as early as two centuries ago, and that its frequency has not increased until the present day.

2.2.9.8 Brief sketch of the development of *brauchen*

Based on the scarce evidence that could be found for the present investigation, the following scenario is the most likely one for the historical development of *brauchen*. The development can be divided into four phases.

Phase I: until 1650. As has been illustrated by Adelung (1793: 1162), Paul (1897: 79), Kolb (1964: 65) and Scaffidi-Abbate (1973: 5), the transitive verb *brauchen* used to refer to the usage of something until the 17th century. Then, it acquired a new interpretation and could express a need for something. In both variants, the verb selected either a genitive NP or an accusative NP. Crucially, the new variant of transitive *brauchen* started out as a negative polarity item, as has been illustrated by Paul (1897: 79). According to Scaffidi-Abbate (1973: 5) and Reis (2005a: 106), the new meaning of *brauchen* was the crucial condition that facilitated the selection of infinitive complements.

Phase II: 1650–1700. *brauchen* acquires an impersonal pattern. It is likely that this development was caused by language contact with the French pattern *il faut* ‘it is necessary ...’. Furthermore, it is plausible to assume that the availability of a variant without referential subject argument facilitated the development of a raising pattern. Grimm and Grimm (1860: 318) provide an example in the DWB that could reveal the precise development of *brauchen* (cf. 437).

- (437) es braucht nun gezeigt zu werden, dasz dieser prinz einer
 it needs now show-PPP to PASS.AUX-INF that this prince a
 solchen abscheulichkeit fähig war.³⁵⁸
 such hideousness able was
 ‘It is only necessary to demonstrate that this Prince was capable of committing such a hideousness.’

It is worth mentioning that *brauchen* in the example given above is not a negative polarity item. Furthermore, it subcategorises the non-referential subject *es*. These facts indicate that this example most probably involves the impersonal pattern of *brauchen*. Whereas the object argument is usually realised by a genitive or accus-

³⁵⁸ Friedrich von Schiller: Werke II 54 Band Geschichte des dreissigjährigen kriegs, zweyter teil, Carlsruhe Bureau deutscher Klassiker (first edition 1792) 1823), p 137.

ative NP, it possibly surfaces here as an infinitive complement. This assumption receives additional support, as Grimm and Grimm (1860: 318) give another example of impersonal *brauchen* that selects a finite *clause* as its object argument instead of a NP. Likewise, Kluempers (1997: 21, 87) considers the impersonal use of *brauchen* as the starting point of its grammaticalisation, even if he assumes that this use is already an instance of subjectification.

Phase III: 1700–1800. In the early 18th century, *brauchen* can be found for the first time with a *zu*-infinitive complement. In this phase, *brauchen* with an infinitive realises its past participle as a *ge*-participle. In the same period, the irregular subjunctive of the past form *bräuchte* can already be found. As can be seen, *brauchen* had already developed the full range of functions by the end of the 18th century: It could be used as a quantificational modal verb and as an epistemic modal verb. It is at the end of phase III that *brauchen* with *zu*-infinitive was mentioned by a grammarian for the first time, namely Adelung (1793: 1162). As Kolb (1964: 75), Welke (1965: 75) and Scaffidi-Abbate (1973: 24) point out, *müssen* is not frequently used with a matrix negation – accordingly, another element became necessary that was suitable to fill the gap left by *müssen*. This observation is in conflict with the corpus study conducted by Brünner (1979: 82). In her corpus of spoken language, she found 525 occurrences of *müssen* without a negation, and 20 occurrences in the scope of negation. As regards *nicht brauchen*, it was found 27 times. According to her point of view, negated *müssen* occurs most commonly in relation with *können* or *müssen* without negation.

Phase IV: 1800 – present. Finally, *brauchen* started to realise its past participle as an IPP. At this point, *brauchen* cannot be found with a bare infinitive yet. Grimm (1837: 168, 949) notices that the IPP is a property that is restricted to verbs that take bare infinitives. This should thus apply to *brauchen*, which selected *zu*-infinitives. At this time, the first uses of *brauchen* with a bare infinitive occur. In the late 19th century, the normative philologist Wustmann (1908: 61) rejects this as incorrect German. Moreover, it is found in the 3rd person singular without a suffix, which could potentially be interpreted as a present indicative (rather than subjunctive) form, cf. the discussion of example (373).

As there were similar verbs in neighbouring languages that were already more grammaticalised before *brauchen* started its development, it is likely that the development of *brauchen* is a result of language contact. Murray (1933: 71) illustrates that *need*, the English counterpart of *brauchen*, developed into an modal auxiliary-like verb much earlier. First of all, it could be used in an impersonal pattern as early as the 14th century. Moreover, *need* is already documented from the late 14th century on with *to*-infinitives, and from the late 15th century with bare infinitive complements. In the 16th century, it started to lose the *s*-suffix in the 3rd person

singular. Some of these developments are illustrated by the examples taken from Murray (1933: 71). A similar observation has been made by Denison (1993: 296).

- (438) How prejudicial such proceedings are . . . need not be defined.³⁵⁹
 (439) My stooping need not to have disturbed you.
 footnotemark

The emergence of negative polar *need* in late Middle English appears to be related to the development of the necessity modal verb *must*. This contemporary use of that latter verb merits attention for two reasons: In morphological respect, *must* is the former past form of the possibility verb *mote*, which acquired a present meaning, subsequently developing a paradigm of its own. In this respect, it has undergone a development that is fairly similar to the one of the preterite presents and the former subjunctive of the past *möchte*. Secondly, it has changed its modal force in the course of its development. Whereas *mote* originally referred to a possibility, the new form *must* can only be employed as a necessity modal verb in Modern English. Thirdly, it displays an idiosyncratic behaviour with respect to the scope of negation. In contrast to the other modal verbs of English, a negated form *must not* is interpreted with a narrow scope interpretation ($\square\text{-}p$). Accordingly, the negation of a necessity ($\neg\square p$) cannot be expressed by a modal auxiliary in English. This, finally, explains why there is a gap in the paradigm for a new specialised modal verb: *need not*, which is used to negate a necessity.

This scenario is supported by the data provided by Murray (1933: 791). The new modal auxiliary *must* with present meaning can be found from the 14th century onwards. The old possibility readings of *mote* were in use until the 15th century, whereas the first necessity readings developed in the 11th century. The narrow scope interpretation of *must not* is at least documented until the 16th century. A similar view is held by Kaita (2012: 394).

The role of influence of foreign languages is, once again, highlighted by a pattern familiar from French. The verb *faillir* ‘need’ is found with an impersonal pattern from the 14th century onwards. This makes an influence from foreign languages very plausible.

Kluempers (1997) provides an alternative path of development, but as he only grounds his theory on a couple of examples taken from the DWB, his account lacks empirical justification.

359 Richard Morris *An essay in defence of ancient architecture* p. 90, (1728), as cited in Murray (1933: 71).

359 Thomas Hull *The story of Sir William Harrington II*, 9 (1771), as cited in Murray (1933: 71).

2.2.10 *werden*

The first author to suggest a modal analysis for *werden* is Vater (1975), although Bauer (1870: 157 §164 Fn.) already argued in a footnote that future tense can have modal meanings as well, illustrating this claim with an epistemic use of *werden*. He is inclined to consider *werden* as marker for a (future) probability. In contrast, Vater (1975: 110) has noticed that *werden* exhibits an epistemic interpretation that is analogous to the one that is typical of the traditional modal verbs. Likewise, the English counterpart *will* exhibits an epistemic reading as well. Accordingly, Brennan (1993: 97) and Enç (1996: 356) have adopted a modal account for the English future auxiliary, which can be analysed as a necessity modal. As Bres and Labeau (2012) illustrate, this holds for the French future auxiliary *aller* ‘go’ with bare infinitive complement as well.

In contrast to the six traditional modal verbs, *werden* does not exhibit any interpretation that could be considered as a circumstantial modal one. Accordingly, Öhlschläger (1989: 8) and Reis (2001: 312) do not regard it as a full member of the class of modal verbs. Instead, *werden* involves two other auxiliary-like functions. First of all, it can be used as a copula with an ingressive or inchoative interpretation taking predicative complements. Moreover, it functions as a passive auxiliary that selects past participle complements. Furthermore, it is used as future auxiliary with bare infinitive complements. Finally, it can be employed as an epistemic modal verb that selects bare infinitive complements as well.

2.2.10.1 Predicative phrases

As Steinitz (1999: 145) and Eisenberg (2004: 85) illustrate, *werden* ‘get’, ‘become’ is used as a copula verb which is similar to *sein* ‘be’, but specified for an ingressive or inchoative meaning. It takes a predicative complement that is typically realised as an adjective such as *kühl* ‘cool’ (cf. 440), or as a NP such as *ein echter Test* ‘a true test’ (cf. 441). Moreover, it can be realised as a directional phrase such as *aus dem Einbrecher* ‘out of the burglar’ or *zum Paradies* or ‘into the paradise’ (cf. 444) – this relativises Maienborn’s (1994: 232) generalisation, according to which directional phrases are generally no licit complement for copulas. Apart from that, it turns out that the copula *werden* can select non-referential subject NPs. This indicates that it is a raising predicate. Similar observations for other copula constructions have been made by Pollard and Sag (1994: 147) and Müller (2002: 72, 2009: 217, 2013: 7):

- (440) In der kommenden Nacht wird es mit 11 bis 9 Grad
 in the upcoming night gets it with 11 to 9 degrees
 empfindlich kühl.³⁶⁰
 sensitively cool
 ‘In the next night, the temperatures will decrease to a level of 11 or 9 degrees’
- (441) Diese Wahl wird ein echter Test für die große Koalition.³⁶¹
 this election becomes a true test for the big coalition
 ‘This election turns into a true test for a big coalition.’
- (442) So wird aus dem Einbrecher plötzlich ein Bigamist.³⁶²
 so gets out the burglar suddenly a bigamist
 ‘Suddenly, the burglar turns into a bigamist.’
- (443) Strohwein ist eine edelsüße Spezialität, die in Deutschland
 straw.wine is a noble.sweet speciality that in Germany
 rar geworden ist.³⁶³
 rare become-PPP(ge) is
 ‘Straw wine is a sweet speciality which became rare in Germany.’
- (444) Spanien ist zum Paradies der Schönheitschirurgie in Europa
 Spain is to.the paradise the-GEN aesthetic.surgery in Europe
 geworden.³⁶⁴
 become-PPP(ge)
 ‘Spain became a paradise of aesthetic surgery in Europe.’

Embedded by the perfect auxiliary *sein*, the copula *werden* is realised as the *ge*-participle *geworden*, as is illustrated in (443) and (444).

2.2.10.2 Passive auxiliary

According to Müller (2002: 147, 2007: 306), the passive auxiliary *werden* is most efficiently analysed as a verb that takes a past participle as its infinitive complement. The crucial property of past participles is that their designated subject argument is not part of their subcategorisation frame anymore. Accordingly, the most prominent argument of the past participle is their object argument. The object argument, in turn, is selected by the passive auxiliary *werden* and becomes its

³⁶⁰ DeReKo: RHZ04/JUL.26792 Rhein-Zeitung, 29/07/2004.

³⁶¹ DeReKo: NUN06/DEZ.02328 Nürnberger Nachrichten, 20/12/2006.

³⁶² DeReKo: RHZ09/NOV.07144 Rhein-Zeitung, 09/11/2009.

³⁶³ DeReKo: RHZ07/AUG.15619 Rhein-Zeitung, 17/08/2007.

³⁶⁴ DeReKo: NUZ05/DEZ.02372 Nürnberger Zeitung, 20/12/2005.

syntactic subject. Roughly speaking, the passive auxiliary involves some sort of object-to-subject raising operation.

In (445), *werden* embeds the transitive verb *betreiben* 'run'. As a matrix verb, it realises its agent argument as a subject NP with nominative case and its theme argument as an object NP with accusative case. As soon as it is selected by the passive auxiliary *werden*, it appears as the past participle form *betrieben* and its designate subject argument will be no longer available in its subcategorisation frame. As a consequence, the theme argument *Möbelcenter oder Baumärkte* 'furniture centres or building centres' raises to the subject position of the matrix predicate *werden*, in which it is realised as a nominative NP.

- (445) Möbelcenter oder Baumärkte werden meist von
furniture.centres or building.centres PASS.AUX most by
denselben Konzernen betrieben.³⁶⁵
the.same concern run-PPP
'Furniture centres or building centres are usually run by the same concern.'
- (446) Der neue Bereich wird von Marcel Klaus geleitet, der
the new area PASS.AUX by Marcel Klaus direct-PPP, who
vom Tamedia-Konzern zur Crossair zurückgekehrt ist.³⁶⁶
from.the Tamedia-concern to.the Crossair return-PPP is
'The new section is directed by Marcel Klaus, who has returned from the Tamedia-Concernt to the Crossair.'
- (447) Die erste große Universalbank ist 1810 von Rothschild
the first bog universal.bank PERF.AUX 1810 by Rothschild
gegründet worden.³⁶⁷
found-PPP PASS.AUX-PPP
'The first big universal bank has been founded in 1810 by Rothschild.'
- (448) Nach mehr als drei Wochen ist die deutsche Archäologin
after more than three weeks is the German archaeologist
Susanne Osthoff von ihren Entführern frei gelassen
Susanne Osthoff by her kidnappers free let-PPP(ge)
geworden.³⁶⁸
PASS.AUX-PPP(ge)
'After, three weeks the German archaeologist Susanne Osthoff has been released by her kidnappers.'

365 DeReKo: R98/JAN.06668 Frankfurter Rundschau, 27/01/1998.

366 DeReKo: A01/NOV.39871 St. Galler Tagblatt, 02/11/2001.

367 DeReKo: R99/FEB.08474 Frankfurter Rundschau, 02/02/1999.

368 DeReKo: BRZ05/DEZ.11398 Braunschweiger Zeitung, 19/12/2005.

According to most standard grammars of German such as Eisenberg (2004: 124) and Eisenberg et al. (2005: 466), *werden* has an irregular past participle that is reminiscent of the IPP. It is realised as a form without a *ge*-prefix that involves an alternation of the stem vowel. The past participle is spelled out as *worden*, as is indicated in (448).

Surprisingly, a few hundreds of instances could be found in the archive T of the DeReKo corpus in which the past participle of the passive auxiliary is spelt out as *geworden*, which is actually the form that belongs to the copula interpretation of *werden*.³⁶⁹ According to traditional grammars, this option should not exist.

Aside from the patterns described above, *werden* can select verbs which do not carry an accusative object. Lacking a direct object, the result of the passivisation with these verbs is a structure which does not contain a syntactic subject. Traditionally it is called *unpersönliches Passiv* ‘impersonal passive’, as is discussed by Müller (2002: 118, 2007:220):

- (449) Dort wird Menschen geholfen, die sich keinen
 there PASS.AUX-SG people-DAT.PL help-PPP REL.PRN REFL no
 Anwalt leisten können.³⁷⁰
 advocate afford-INF can
 ‘At this place, people get aid which cannot afford an advocate.’

Crucially, the sentence lacks a nominative subject NP. The passive auxiliary exhibits its default inflection, which is 3rd person singular in German. The dative object of the passivised verb *helfen* ‘help’ continues to bear dative case and does not agree with the finite passive auxiliary *wird*.

2.2.10.3 Future related interpretations

There are instances of *werden* with an infinitive complement in which the embedded predicate refers to an event in the future. It is contested to what extent these uses can be analysed as future tense auxiliary. On the one hand, some authors, such as Krämer (2005: 26), show that this future related interpretation of *werden* can be clearly distinguished from its epistemic counterpart. Therefore, she assumes that *werden* has an independent interpretation as a future auxiliary. By contrast, Vater (1975) and Erb (2001: 176) argue that *werden* with an infinitive complement always has to be considered as a modal auxiliary, even in its uses with future related interpretations. Vater (1975: 95) notices that *werden* behaves atypic-

³⁶⁹ Investigation carried out on 22nd July 2012. The regular past participle of the passive auxiliary *worden* could be found 500,000 in the same archive.

³⁷⁰ DeReKo: NUN06/AUG.00493 Nürnberger Nachrichten, 04.08.2006.

ally, as it can embed complements that refer to the past. As Erb (2001: 146) illustrates, *werden* with an infinitive occurs in an environment that is similar to modal verbs, rather than to the one in which the perfect tense auxiliary occurs. While Vater (1975: 119) assumes that *werden* can be either interpreted in a circumstantial modal or an epistemic modal way, Erb (2001: 175) argues that *werden* is always an epistemic modal verb. Likewise, Enç (1996: 351) has demonstrated that English *will* differs essentially from genuine tense auxiliaries with respect to sequence of tense effects and embedding other tense operators.

Furthermore, authors who advocate a modal analysis of the future auxiliaries *werden* and *will* do not agree with respect to the specification of the relevant modal force. Whereas Brennan (1993: 97) and Enç (1996: 356) conclude that the English future auxiliary *will* is a necessity modal operator, Vater (1975: 113) argues that *werden* carries a modal force situated between the one of *können* (possibility) and the one of *müssen* (necessity). Likewise, Zifonun (1997: 1910) classifies *werden* as a modal probability operator. Less explicitly, Kratzer (1981: 58) is inclined to treat *werden* as a necessity modal operator, as she associates it with the adverb *certainly*.

Finally, Kissine (2008) argues for English that *will* always has to be considered as a future auxiliary, rather than a modal auxiliary. At this point, it is not clear to what extent this line of reasoning could be plausibly defended for German.

As it turns out, it is no trivial matter to capture the future oriented uses of *werden*. But it seems to be useful to draw a careful distinction between the future oriented reading and the epistemic one. In contrast to the analysis suggested by Erb (2001: 175), there are instances of *werden* that occur in environments in which genuine epistemic modal verbs cannot occur. If all of the instances of *werden* were indeed epistemic, additional explanations would become necessary to explain the acceptability of the examples below (450)–(453).

- (450) Wir werden jetzt 1000 Unternehmen anschreiben und anfragen,
 we will now 1000 enterprises write-INF and ask-INF
 ob sie sich an dieser tollen Aktion beteiligen.³⁷¹
 whether they REFL at this amazing action participate
 ‘Now, we will write to 1000 enterprises in order to ask whether they want to participate in this amazing action.’
- (451) In der Goldbäckerei Schulze wird es von 11 bis 12 Uhr und
 in the Goldbäckerei Schulze will it from 11 until 12 o'clock and
 von 12 bis 13 Uhr wieder eine Kinderbetreuung geben.³⁷²
 from 12 until 13 o'clock again a child.care give-INF

³⁷¹ DeReKo: BRZ06/JUN.06668 Braunschweiger Zeitung, 14/06/2006.

‘There will be a child care again in the Goldbäckerei Schulze from 11 am to 12 am and from 12 am to 1 pm.’

- (452) Die Freie Bürgerliste hat allen Grund zum Feiern. Sie wird in
the Freie Bürgerliste has all reason to.the celebrate she will bin
Zukunft mit drei Mandaten im Gemeinderat vertreten
future with three mandates in.the city.council represent-PPP
sein.³⁷³
be-INF

‘The Freie Bürgerliste has every reason to celebrate. They will be represented in the city council by three mandates.’

- (453) Er selbst wird dann zwar bereits das 65. Lebensjahr
he himself will then PART already the 65th live.age
überschritten haben.³⁷⁴
pass-PPP have-INF

‘Then, he will already have passed the 65th year of his life.’

First of all, the future oriented use of *werden* fairly often selects subjects that are specified for the 1st person singular or plural (cf. 450). This is unexpected for any approach that assumes that *werden* is always an epistemic modal verb: As Heine (1995: 24) has pointed out, the 1st person subjects are very unusual for epistemic modal verbs. Erb (2001: 176) argues that it is the 1st person feature that brings about the future resonance. However, the scope of her explanation is limited and would not apply to any of the other examples given above.

Furthermore, Krämer (2005: 23) points out that *werden* with an infinitive (i) can be embedded in restrictive relative clauses and without any complication, (ii) it can bear verum focus and finally, (iii) it can be embedded by predicates of desire such as *hoffen*. Crucially, in all of these environments it is restricted to future interpretation.

In none of the examples illustrated above is an epistemic interpretation plausible. Assuming that epistemic *werden* involves a (weak) necessity operator, it should be possible to substitute it with another epistemic necessity operator such as *müssen*. However, any replacement would drastically decrease the speaker’s commitment to the validity of the proposition. This indicates that there are at least two interpretations of *werden* with respect to the degree of the speaker’s commitment. Likewise, Krämer (2005: 60) argues that epistemic *werden* is specified for [- EVIDENCE]. This indicates that the commitment to the embedded proposition

372 DeReKo: BRZ07/DEZ. 19912 Braunschweiger Zeitung, 07/12/2007.

373 DeReKo: BVZ07/OKT.01215 Burgenländische Volkszeitung, 10/10/2007.

374 DeReKo: HAZ08/NOV.03088 Hannoversche Allgemeine, 18/11/2008.

is not based on direct evidence. Such a restriction does not apply to the future interpretations listed above.

As it turns out, *werden* exhibits a whole range of striking analogies with respect to circumstantial modal verbs: It selects a bare infinitive complement, it tolerates non-referential subjects (cf. 451) and it locates the embedded predication in a time interval after the Time of Utterance. However, there are some crucial differences as well. First of all, Erb (2001: 146) illustrates that the future reading of *werden* is neither found as an infinitive nor as a past participle. This does not apply to circumstantial modal verbs in German. Moreover, English *will* can be used as a quantificational necessity modal verb, as has been pointed out by Brennan (1993: 97) and Enç (1996: 356). This does not seem to be the case for its German counterpart *werden* to the same extent. Once again, this illustrates that there are differences between the future reading of *werden* and the six traditional modal verbs.

All of the observations made above indicate that under closer scrutiny, *werden* can neither be regarded as forming a natural class with the six traditional circumstantial modal verbs, nor with the epistemic modal verbs.

2.2.10.4 Raising infinitives with clause modification

As Bauer (1870: 157 §164 Fn.), Welke (1965: 12), Vater (1975: 110), Fritz (1991: 43), Engel (1996: 463) Erb (2001: 161) and Krämer (2005: 57) have pointed out, *werden* with an infinitive complement can be interpreted in an epistemic way, analogous to the epistemic interpretation of the traditional modal verbs. As Krämer (2005: 128) demonstrates, the epistemic pattern has emerged out of the future interpretation. According to Fritz (1991: 43), this development must have occurred prior to the early 17th century, the period when the first instances of epistemic *werden* are documented.

Just as the traditional modal verbs do, *werden* is restricted to an epistemic interpretation whenever it embeds a predication consisting of an identified individual and a predicate that refers to a state that cannot be changed, or a predicate that refers to some past event (cf. 456 and 458).

- (454) Der Leser wird wohl den wackeren Komponisten Gluck
 the reader will probably the brave composer Gluck
 kennen, vornamens Christoph Willibald, einen
 know-INF, with.first.name Christoph Willibald a
 Oberpfälzer.³⁷⁵
 upper.Palatinate

‘The reader will probably know the composer Gluck whose first name is Christoph Willibald, from Upper Palatinate.’

- (455) „Vermutlich wird der 16-Jährige der Täter sein“, sagt
presumably will the 16.year.old the culprit be-INF says
Polizeisprecher Thomas Buchheit, der aber nicht ausschließen
police.spokesman Thomas Buchheit who yet NEG exclude
will, dass der junge Mann in Notwehr gehandelt haben
wants that the young man in self-defence act-PPP have-INF
könnte.³⁷⁶
could

‘„Presumably, the 16 year old will be the culprit” says the police spokesman Thomas Buchheit, who does not want to exclude that the young man has acted in self-defence.’

- (456) Es wird schon einen Grund gehabt haben, warum die
it will already a reason have-PPP have why the
Eisbärin ihre Jungen gefressen hat.³⁷⁷
ice.bear.lady her offspring eaten has

‘There will be a reason why the polar bear has eaten her offspring.’

- (457) So knapp 1000 Zuschauer werden es wohl gewesen sein, die
so barely 1000 spectators will it wohl be-PPP be-INF that
trotzdem kamen.³⁷⁸
nevertheless came

‘There will have been barely 1000 spectators that came nevertheless.’

- (458) In meinem zwölften Lebensjahr wird es gewesen sein, als am
in my twelfth live.year will it be-PPP be-INF as at.the
Frühmorgen des heiligen Christ abends mein Vater
early.morning the-GEN holy-GEN christ evening-GEN my father
mich an der Schulter rüttelte.³⁷⁹
me on the shoulder shook

‘It must have been in when I was twelve that my father shook me on my shoulder.’

Furthermore, in all of the instances above the embedded proposition is not part of the speaker’s knowledge. In a similar manner, Comrie (1989: 60), Fabricius-Hansen (2000: 183–6), Erb (2001: 161) and Krämer (2005: 60, 133) argue that the

375 DeReKo: O98/AUG.75935 Neue Kronen-Zeitung, 04/08/1998.

376 DeReKo: HAZ08/MAI.03238 Hannoversche Allgemeine, 19/05/2008.

377 DeReKo: NUN08/JAN.00722 Nürnberger Nachrichten, 08/01/2008.

378 DeReKo: NUN07/APR.00752 Nürnberger Nachrichten, 10/04/2007.

379 DeReKo: K00/DEZ.81948 Kleine Zeitung, 24/12/2000.

speaker does not have the direct evidence which is necessary to assert the embedded proposition.

It is remarkable that most of the instances found in the DeReKo corpus have been taken from interviews, direct speech and other instantiations of spoken language. Furthermore, epistemic *werden* is frequently used for the estimations of numbers, as is exemplified in (457).

There are further parallels between *werden* and the traditional modal verbs: As Erb (2001: 146) illustrates, epistemic *werden* can hardly be found as an infinitive or as a past participle. But then, Krämer (2005: 34) demonstrates that epistemic *werden* is excluded from a couple of environments in which epistemic *müssen* and *können* can occur, such as in the scope of negation, in questions, and under verum focus. This leads Krämer (2005: 49) to the conclusion that *werden* is an extra-propositional evidential operator in opposition to epistemic modal verbs. As this matter is far from trivial, it will be postponed to Section 4.

As pointed out above, it is far from obvious which modal force the epistemic use of *werden* could carry. While Brennan (1993: 97) and Enç (1996: 356) analyse its English counterpart *will* as a necessity modal, the situation in German is less obvious. Kratzer (1981: 58) appears to be inclined to analyse *werden* as a necessity modal operator, associating it with the adverb *certainly*. Zifonun (1997: 1910) concludes that epistemic *werden* acts as a modal probability operator. In a similar vein, Fritz (1997: 94) concludes that epistemic *werden* expresses a stronger modal force than epistemic *können* but a weaker modal force than epistemic *müssen*. Finally, Vater (1975: 113) localises the modal force of *werden* somewhere between that of *können* and *müssen*.

If epistemic *werden* was indeed a canonical necessity modal operator such as *müssen*, it should be possible to substitute it with *müssen* without affecting the overall interpretation. However, such a replacement would change the meaning of the pattern (cf. 456). Moreover, it is fairly questionable that the semantic difference between epistemic *müssen* and epistemic *werden* is only a matter of modal force.

In order to account for the different interpretations of epistemic *must* and epistemic *will* in English, Sweetser (1990: 55) and Ziegeler (2006: 88) conclude that the specific contribution of epistemic *will* concerns the verification of the embedded proposition. Whereas the future interpretation of *will* expresses that the speaker expects a certain event to occur in the future, the epistemic reading indicates that the speaker holds the expectation that the speculative embedded proposition can be verified in the future. As Sweetser (1990: 55) concludes, the use of epistemic *will* is based on the assumption “if we check we will find out”. Fabricius-Hansen (1999: 124) and Krämer (2005: 133) suggest an analogous analysis for German *werden*.

Though very plausible, the approaches sketched above faces serious problems. There are uses of epistemic *werden* in which the speaker definitely knows that he will never be in a position to verify the speculative embedded proposition:

- (459) Sie werden es also gewusst haben: Diesmal würden sie
 they will it thus know-PPP have-INF this.time would they
 nicht mehr wegkommen.³⁸⁰
 NEG more away.get-INF
 ‘They will/must have known that they would not be to late to escape this time.’

Example (459) is taken from a text that deals with the suicide of the national socialist terrorists Uwe Bönhardt and Uwe Mundlos. In their final moment, their bus was surrounded by the police, there was no way of escaping. Under unknown circumstances the two terrorists shot themselves. Using the epistemic instance of *werden*, the author of that article attributes a thought to the two men which they could have had in mind leading up to their suicide. It is fairly doubtful if the author really is convinced that he will find out the last thoughts of these terrorists.

As it turns out, the suggestion made by Sweetser (1990: 55) is not entirely convincing and requires slight modifications.

2.2.11 *scheinen* and *dünken*

While *werden* and *brauchen* exhibit patterns that are entirely parallel to the epistemic readings of modals, the raising verb *scheinen* ‘seem, appear’ evidently differs in a couple of respects. First of all, it is restricted to *zu*-infinitive complements. In opposition to *brauchen*, no instances with a bare infinitive complement have been observed so far. Moreover, it always exhibits some sort of epistemic or evidential interpretation, except for its unergative use. Finally, *scheinen* optionally realises the epistemic attitude holder as dative NP.

There is a lively debate going on to what extent *scheinen* with *zu*-infinitive can be subsumed under the same syntactic and semantic class as epistemic modal verbs. On the one hand, some authors, such as Askedal (1998: 61) and Wurmbrand (2001: 205), argue that *scheinen* is an epistemic verb, just like the traditional epistemic modal verbs. On the other hand, Pafel (1989: 143) holds that *scheinen* behaves differently in a couple of essential points: It can optionally realise the epistemic attitude holder as its indirect object NP.

As has been noticed by Ebert (1976: 41–45) and Diewald (2001: 101), *scheinen* is similar to *dünken* ‘seem, to cause to think’ in many respects, which used to be

380 Der Spiegel, 47/2011 21.11., p.22.

the causative counterpart of *denken* ‘think’. However, the latter element has almost disappeared over the course of the last centuries. As *dünken* behaves slightly differently, it will be useful to determine the nature of *scheinen*.

The verb *scheinen* occurs in five syntactic patterns: (i) as an unergative intransitive verb, (ii) as a copula, (iii) as an impersonal verb with a finite *dass*-clause complement, (iv) as an impersonal verb that selects a hypothetical comparative *als ob*-clause, and (v) as a raising verb that selects a *zu*-infinitive complement. Similar classifications have been proposed by Pafel (1989: 124), Askedal (1998: 70), Diewald (2001: 94) and Lima (2004). In opposition to that, *dünken* can only be found in the configurations (ii)–(v) depending on the respective historical period. In Contemporary Standard German, *dünken* has almost disappeared, though it is still occasionally used as a copula.

2.2.11.1 Unergative uses

As has been illustrated by Diewald (2001: 95) and Lima (2004), *scheinen* can still be used as an intransitive main verb with a clear lexical meaning. In this use, it determines its subject referent as a source that emits light, as is exemplified in (460)–(461).

(460) Der fast runde Mond scheint am Himmel.³⁸¹
 the almost round moon shines at.the sky
 ‘The almost round moon is shining in the sky.’

(461) Wie gut ist es, wenn in der Dunkelheit Lichter scheinen und das
 How good is it when in the darkness light shine and the
 Dunkle hell machen.³⁸²
 dark bright make
 ‘How good it is when there are lights shining in the darkness and they make the dark become bright.’

Occasionally, unergative *scheinen* is complemented by a directional phrase that describes the path the ray of light follows.

2.2.11.2 Predicative phrases

As has been illustrated by Askedal (1998: 52–53) and Diewald (2001: 95) and Lima (2004) *scheinen* can be used as a copula that selects various types of predicative phrases: adjectives (cf. 462), noun phrases (cf. 463) and prepositional phrases. In

³⁸¹ DeReKo: A09/NOV.00303 St. Galler Tagblatt, 02/11/2009.

³⁸² DeReKo: M11/DEZ.03530 Mannheimer Morgen, 10/12/2011.

its copula pattern, *scheinen* is similar to English *seem* in that it expresses that somebody has the evidence to conclude that the embedded predication is valid.

In opposition to other copulas such as *sein*, *werden* or *bleiben* ‘stay’, *scheinen* optionally realises a dative argument that refers to the epistemic attitude holder who is exposed to the unspecified type of evidence. As Askedal (1998: 52–53) points out, *scheinen* is found with all types of predicative phrases, with as well as without a dative object.

The corpus study presented here has revealed three interesting tendencies. First of all, the copula *scheinen* does not occur very frequently with genuine predicative NPs, as in (463). Furthermore, the dative object of *scheinen* is not very often realised. Finally, if it is realised, it is almost always represented by a 1st person pronoun (*mir* or *uns*). Examples with other types of dative NPs are fairly rare, though they do occur (cf. 463):

- (462) Doch ihr Ehrgeiz scheint ungebrochen.³⁸³
 yet her ambition seems unbowed.
 ‘Yet, her ambition seems unbowed.’
- (463) Gewaltloser Widerstand scheint ihm das einzig probate
 non-violent resistance appears him-DAT the only appropriate
 Mittel.³⁸⁴
 means
 ‘Non-violent resistance appears to be the only appropriate means to him.’

The verb *dünken* behaves like *scheinen* in many respects. It can be combined with predicative adjectives and predicative nouns. Its object is almost always specified for the 1st person. However, it differs in two respects. Firstly, *dünken* realises its epistemic attitude holder as an accusative NP, rather than a dative NP. Secondly, this accusative NP appears to be obligatory and is present in most of the instances found in the DEREKO corpus.

- (464) Der Weg nach Tobel dünkt ihn unendlich weit.³⁸⁵
 the way to Tobel thin-CAUS him-ACC eternally long
 ‘The way to Tobel seems eternally long.’
- (465) Eine Ewigkeit dünkt mich das Warten.³⁸⁶
 a eternity think-CAUS me-ACC the waiting
 ‘The waiting seems an eternity to him.’

383 DeReKo: M06/JAN.01737 Mannheimer Morgen, 09/01/2006.

384 DeReKo: HAZ08/NOV.04416 Hannoversche Allgemeine, 25/11/2008.

385 DeReKo: A98/FEB.12719 St. Galler Tagblatt, 28/02/1998.

386 DeReKo: O95/MAI.44351 Neue Kronen-Zeitung, 05/05/1995.

As *dünken* is an archaic pattern, it becomes less and less frequent. Most contemporary native speakers contaminate the fairly particular pattern of *dünken* with semantically related patterns of verbs that occur more frequently, such as *scheinen*. Accordingly, the accusative NP alternates with a dative NP, as will be exemplified in the upcoming sections. Moreover, instances can be found in which *dünken* has a regular preterite form.

2.2.11.3 *dass*-clauses

Pafel (1989: 124), Askedal (1998: 52) and Diewald (2001: 98) have illustrated in great detail that *scheinen* can be used as an impersonal verb that subcategorises a finite *dass*-clause. The interpretation is analogous to the copula pattern of *scheinen*. As Askedal (1998: 52) has observed, the realisation of the dative object is optional. Once again, this dative object is mostly instantiated as a 1st person pronoun. In some rare cases, other types of NPs can be found in this context as well, as is exemplified in (466).

As regards *dünken*, it behaves nearly analogously to *scheinen*, except for the fact that it has an obligatory object. As example (469) indicates, some speakers tend to use a dative NP rather than an accusative one, possibly due to contamination with the *scheinen*-pattern.

- (466) Ihm scheint, dass die Zeit der touristischen
 him-DAT seems that the time the-GEN tourist
 Erschliessungen der Alpen mit grosstechnischen Anlagen
 development the-GEN alps-GEN with big.technical sites
 vorbei ist.³⁸⁷
 over is
 'It seems to him that the time of tourist development in the alps with colossal technical sites is over.'
- (467) Es scheint, dass er sich an das Leben in freier Natur gewöhnt
 it seems that he REFL on the live in free nature accustomed
 hat³⁸⁸
 has
 'It seems that it has become accustomed to the life in the great outdoors.'
- (468) Aber mich dünkt, dass der Weg dorthin immer länger
 but me-ACC think-CAUS that the way there always long
 wird.³⁸⁹
 becomes

³⁸⁷ DeReKo: A01/DEZ.48633 St. Galler Tagblatt, 03/12/2001.

³⁸⁸ DeReKo: A08/APR.03463 St. Galler Tagblatt, 09/04/2008.

‘Yet, it appears to me that it the way there becomes longer and longer.’

- (469) Mir dünkt, dass Bauvorhaben der öffentlichen
me-DAT thinks-CAUS that building.projects the-GEN public-GEN
Hand mit Absicht so niedrig wie möglich kalkuliert
hand-GEN with intention as low as possible calculate-PPP
werden, damit sie beim Steuerzahler als günstig
AUX.PASS so.that they at.the tax.payer as cheap
erscheinen.³⁹⁰
appear

‘It seems to me that building projects of the public authorities are intentionally calculated to be as cheap as possible in order to make them look like a bargain to the tax payer.’

As Askedal (1998: 52) has pointed out, the complement clause can be alternatively realised as a clause that exhibits a verb second word order, and that does not include any subordinating conjunction. As this alternation does not affect only *scheinen* with finite *dass*-clause but a very extensive class of verbs, it will not receive any further attention here.

As Diewald (2001: 104) emphasises, *scheinen* with finite *dass*-clause occurs from the 18th century onwards, whereas the pattern with *zu*-infinitive complements already emerged in the 16th century, as has been illustrated by Ebert (1976: 41). Accordingly, the pattern with *zu*-infinitive cannot be derived from *dass*-clauses, as is sometimes suggested, for instance by Chomsky (1981: 43). Moreover, Ebert (1976: 41) has demonstrated that *dünken* with *daz*-clause is already documented in the Middle High German *pârzival*.

2.2.11.4 Hypothetical comparative *als ob*-clauses

Askedal (1998: 53) points out that *scheinen* is moreover found with finite *als ob*-clauses and *als*-clauses. These types of subordinate clauses strikingly resemble hypothetical comparative clauses, as they are characterised in Jäger (2010: 469). In a similar way, *dünken* can be combined with hypothetical comparative clauses as well.

As far as argument structure is concerned, both verbs behave in the same way as they do with *dass*-clause complements: In the case of *scheinen* the realisation of the dative NP is optional (cf. 470–471), in the case of *dünken* the realisation of the argument is obligatory; once again, accusative and dative alternate (cf. 472–473).

389 DeReKo: A11/JUL.02254 St. Galler Tagblatt, 07/07/2011.

390 DeReKo: RHZ11/JUL.06178 Rhein-Zeitung, 06/07/2011.

- (470) es scheint mir, als ob du heute nicht irren könntest.³⁹¹
 it seems me-DAT as if you today NEG err could
 'It seems to me as if you could not err today.'
- (471) Es scheint nur so, als ob Wolfgang Schäuble nun gerade
 it seems only so as if Wolfgang Schäuble now just
 deswegen neue Gesprächsbereitschaft signalisiert: Öffentlich,
 therefore new talk.readiness signals in.public
 über die Medien, wandte er sich schon vor der von den
 through the media addressed he REFL already before the by the
 Währungshütern verabreichten Ohrfeige an die
 currency.watchdog administered slap to the
 Sozialdemokraten.³⁹²
 Social.democrats
 'It only seems as if Wolfgang Schäuble signals new readiness to negotiate for that
 reason. Yet, by media he had already addressed to the Social Democrats before they
 had got their slap by the currency watchdog.'
- (472) Eine Nacht hatte er auf der Harzburg einen schweren Traum; es
 a night had he at the Harzburg a heavy dream it
 deuchte ihm, als ob er mit einem furchtbaren Eber
 think-PST.CAUS him-DAT as if he with a terrible boar
 kämpfe, der ihn nach langem Streit zuletzt besiegte.³⁹³
 fight-SBJV.PRS that him after long fight finally overwhelmed
 'One night at the Harzburg, he had an oppressive dream. It seemed to him as if he
 were fighting with a terrible boar that overwhelmed him after a long battle.'
- (473) Es dünkt mich, als ob alle ein Lächeln auf den Lippen
 it thinks-CAUS me-ACC as if all a smile on the lips
 hätten³⁹⁴
 had
 'It seems to me as if everybody had a smile on his lips.'

As the instance in example (472) indicates, the tendency to replace the accusative NP with a dative NP is not a recent development. It is already found in the collection of tales edited by the Grimm Brothers in the early 19th century.

Example (471) reveals the true nature of the verb. The speaker clearly distinguishes between the mere appearance of a state of affairs and its factual being. He

391 DeReKo: GOE/AGM.07859 Goethe: Wilhelm Meisters Wanderjahre, [Roman], (Erstv. 1821).

392 DeReKo: NUN97/AUG.01105 Nürnberger Nachrichten, 14/08/1997.

393 DeReKo: GRI/SAG.00311 Des Hackelnberg Traum, (Erstv. 1816 ; 1818), In: Deutsche Sagen, gesammelt von Jacob und Wilhelm Grimm. – o.O., 1891.

394 DeReKo: SOZ11/DEZ.05459 Die Südostschweiz, 27/12/2011.

is totally aware that the willingness to negotiate signalled by Schäuble is not new. He just wants to stress that it only looks as if it were new. Using *scheinen*, it is possible for the speaker to refer to the mere appearance of a state of affairs, even if he knows that it is false. A similar example has been provided by Colomo (2011: 225). Canonical epistemic modal verbs cannot be used in this way unless they are in the scope of a counterfactual operator, as has been shown in Section 2.2.6, 2.2.1 and 2.2.2. But in such configurations it remains to be checked what influence the counterfactual operator has.

Finally, *scheinen* in example (471) appears to carry verum focus. If the sentence was uttered, it is very likely that the verb *scheint* would bear focal stress. The alternatives under discussion are {appearance, factual being}. In the specific example given above, the focus particle *nur* would clearly refer to *scheint*, blocking all of the remaining alternatives. Interestingly, the effect is reminiscent of verum focus, as has been discussed by Höhle (1992). A similar effect can be observed with some epistemic modal verbs, as is illustrated in Section 4.9 and 4.10.

These facts reveal the true nature of the verbs under analysis: They compare two state of affairs. In the context of example (471), the speaker faces a state of affairs which exhibits the characteristics as in the hypothetical state of affairs in which Wolfgang Schäuble signals willingness to negotiate. The first state of affairs is syntactically represented by the subject *es*, and the second state of affairs is realised as the hypothetical comparative *als ob*-clause. As a consequence, the semantic contribution of *scheinen* is to introduce a hypothetical state of affairs, to which the actual situation is compared. This also reflects the nature of its original use as a copula, in which two properties are associated to each other.

2.2.11.5 Raising infinitives with clause modification

Finally, it has been demonstrated by Ebert (1976: 41), Pafel (1989: 124), Askedal (1998: 52) and Diewald (2001: 97) that *scheinen* selects a *zu*-infinitive complement. There is a widespread consensus that *scheinen* does not select a referential subject and that, consequently, it has to be a raising verb.

Once again, the realisation of the dative object is optional in the case of *scheinen*, as is illustrated in examples (474)–(477). However, as Askedal (1998: 56) has found out, the dative argument occurs far less frequently whenever *scheinen* selects a *zu*-infinitive complement, specifically in only 5.22% of the cases of his corpus. By contrast, *scheinen* with finite clausal complements realises the dative NP in 38,52% of the cases, and *scheinen* with a predicative complement in even 56,05% of the cases. Nevertheless, it can be found in the DeReKO corpus, as illustrated in examples (475)–(477). Another example is provided by Askedal (1998: 52).

In opposition to *scheinen*, the use of *dünken* with *zu*-infinitive complement has almost disappeared from the contemporary language, as has been shown by Maché and Abraham (2011: 266). In earlier stages, it was more frequent in this configuration, and it even exhibited a IPP morphology in the 16th century (cf. 479).

- (474) Jospin scheint das Opfer seines eigenen Erfolgs
 Jospin seems the victim his-GEN OWN-GEN success-GEN
 geworden zu sein.³⁹⁵
 become-PPP to be-INF
 ‘Jospin seems to have become the victim of his own success.’
- (475) Eher das Gegenteil scheint mir der Fall zu sein.³⁹⁶
 rather the opposite seems me-DAT the case to be-INF
 ‘It seems to me that rather the opposite is the case.’
- (476) Jede der Figuren scheint mir in ihren Kokon
 each the-GEN character-GEN seem me-DAT in her cocoon
 eingesponnen zu sein.³⁹⁷
 form-INF to be-INF
 ‘It seem to me that each character is caught in his own cocoon.’
- (477) Deren Gesichter schienen ihm wie in einem rot gepunkteten
 their faces seem him-DAT like in a red dotted
 Nebel zu verschwimmen.³⁹⁸
 mist to blur-INF
 ‘It seemed to him as if their faces blurred in a red dotted mist.’
- (478) Lohnverzicht und Abkehr vom 30-Stunden-Modell, das
 wage.sacrifice and renunciation from.the 30.hours.model that
 dünkt sie denn doch reines Teufelswerk zu sein.³⁹⁹
 think-SBJV.PST them-ACC then PART pure devil.work to be-INF
 ‘It seems to them that the sacrifice of their wage and the renunciation from the 30
 hours model is the pure work of the devil.’
- (479) Vnd sagte jm / wie er die Portugaleser hette
 and said him how he the Portuguese have-SBJV.PST
 lernen kennen / vnd er were allwegen jr
 learn-PPP(ipp) know-INF and he be-SBJV.PST always their

395 DeReKo: E00/MAR.07351 Zürcher Tagesanzeiger, 17/03/2000.

396 DeReKo: SOZ10/MAI.04445 Die Südostschweiz, 25/05/2010.

397 DeReKo: BRZ07/JAN.19721 Braunschweiger Zeitung, 25/01/2007.

398 DeReKo: BRZ06/MAR.07145 Braunschweiger Zeitung, 13/03/2006.

399 DeReKo: NUN95/NOV.00207 Nürnberger Nachrichten, 03/11/1995.

Freund gewesen / denn sie hetten jn
 friend be-PPP since they have-SBJV.PST him-ACC
 rechtschaffene Leut duencken seyn /⁴⁰⁰
 righteous people think-CAUS.PPP(ipp) be-INF

'And he said to him how he made acquaintance with the Portuguese and that he always was their friend as they seemed to him righteous people.'

As examples (480) and (481) illustrate, *scheinen* allows for the selection of infinitives with non-referential subject NPs. This indicates that it has to be analysed as a raising verb indeed.

- (480) Unter den Bier-Fans scheint es wesentlich mehr Kampftrinker
 among the beer-fans seem it considerably more binge drinker
 zu geben als unter den Wein-Freunden.⁴⁰¹
 to give-INF than among the wine-friends

'Among the fans of beer, there seem to be considerably more binge drinkers than among the friends of wine.'

- (481) In Deutschland scheint es elf Monate im Jahr zu regnen.⁴⁰²
 in Germany seem it eleven months in.the year to rain-INF

'In Germany, it seems to rain eleven months a year.'

As has been mentioned above, some authors group *scheinen* with *zu*-infinitive together with the traditional epistemic modal verbs into a single syntactic and semantic class. Askedal (1998: 60) illustrates that *scheinen* involves (i) a raising pattern, (ii) it selects an obligatorily coherent infinitive complement/it triggers clause union, (iii) it lacks an imperative, (iv) it lacks an infinitive, (v) it lacks a past participle, and (vi) it cannot select VP-anaphora, as has also been illustrated by Neugeborn (1976). These observations lead Askedal (1998: 61) to the conclusion that *scheinen* with a *zu*-infinitive complement belongs to the class of future and epistemic auxiliaries, together with the traditional epistemic modal verbs *werden*, *drohen*, *versprechen* and *pflügen*. For similar reason, Wurmbrand (2001: 205) argues that *scheinen* belongs to the class of epistemic (modal) verbs. In any case, it cannot be denied that there are analogies, the question is how essential they are.

However, there are some respects in which *scheinen* behaves fairly differently from the traditional epistemic modal verbs. Firstly, (i) *scheinen* grammatically realises the epistemic attitude holder, as has been pointed out by Pafel (1989: 125). Apart from that, (ii) it behaves in a peculiar way when it bears past morphology.

⁴⁰⁰ Ulrich Schmid *Neuwe Welt*, p. 20b, (1567).

⁴⁰¹ DeReKo: RHZ96/AUG.07223 Rhein-Zeitung, 14/08/1996.

⁴⁰² DeReKo: NUZ06/JUN.00564 Nürnberger Zeitung, 06/06/2006.

In this type of context, it refers to past evidence. Nevertheless, the Time of Evaluation can be identical to the Time of Utterance, as will be illustrated in more detail in Section 5.2. In these environments, it cannot be replaced with an epistemic modal with past morphology. Moreover, (iii) *scheinen* introduces an infinitive particle *zu* that cannot be dropped under any circumstance. Furthermore, (iv) the speaker can know that the embedded proposition is in fact false, as has been demonstrated by Colomo (2011: 225). This is a fairly unlikely scenario with epistemic modal verbs and obviously only possible if they are in the scope of a counterfactual operator, as has been demonstrated in Sections 2.2.1, 2.2.2 and 2.2.6. Finally, (v) *scheinen* does not involve any interpretation that could be considered as a circumstantial modality, or future oriented reading as it is possible with *werden*.

All of these observations indicate that *scheinen* is a predicate that behaves in a similar way with respect to epistemic modal verbs. Yet, it turns out that it is substantially different from epistemic modal verbs, and it occurs in many contexts where epistemic modal verbs are totally excluded. Apart from that, any analysis which considers *scheinen* as an epistemic modal verb neglects the fact that it also embeds hypothetical comparative clauses. Accordingly, *scheinen* is a verb which compares two state of affairs. Even if it is less explicit, this analysis also applies to *scheinen* with an infinitive complement.

Uttering example (474), the speaker expresses that he perceives a state of affairs in the real world which exhibits a subset of essential characteristics which are identical with the hypothetical state of affairs in which Jospin is the victim of his own success. As with the *CoDeC* for epistemic modal verbs, the speaker indicates with respect to the proposition {Jospin is the victim of his own success} that he does not perceive all the essential characteristics which are identical with the hypothetical state of affairs in which Jospin is the victim of his own success. This could be a result of Grice's (1989: 26) *Maxim of Quantity Q2*, which states that a speaker should not make his contribution more informative than is required.

2.2.12 *drohen, versprechen* and *verheißen*

As has been illustrated by Bech (1955: 126–127), Kiss (1995: 154), Askedal (1997b), Reis (2001: 312 Fn. 40, 2005, 2007), Wurmbrand (2001: 205), Lima (2005) and Colomo (2011), *drohen* 'threaten' and *versprechen* 'promise' can be used as raising verbs that appear to be related to epistemic modal verbs. Moreover, Łukasz Jędrzejowski (pers. commun.) has suggested that *verheißen* 'augur, promise' is another promising candidate that could occur in this pattern as well. And indeed, it can be found in a very similar distribution as *versprechen*.

This phenomenon is not restricted to German but it can be found in several European languages such as English *promise* and *threaten* (cf. Traugott (1997)), Portuguese *ameaçar* ‘threaten’ (cf. Lima (2005)) and Spanish *prometer* ‘promise’ and *amenazar* (cf. Cornillie (2007: 85)).

Once again, there are accounts in which *drohen* and *versprechen* are explicitly analysed as epistemic modal verbs, e.g. Askedal (1997b: 14), Wurmbrand (2001). In contrast to that, there are also approaches in which the opposite is assumed. Reis (2001: 312 Fn. 40, 2005: 129, 2007: 13) and Colomo (2011) argue that *drohen* and *versprechen* differ from epistemic modal verbs in essential respects. Accordingly, they should not be treated as epistemic modal verbs. As will be seen in the empirical investigations presented below, the latter approach has more explanatory potential.

As will be shown, all of the verbs under discussion occur in various syntactic patterns. However, they do not behave in a uniform way. First of all, *drohen* is employed (i) as a two place intransitive verb that selects a dative NP and a *mit*-PP (‘with’-PP); (ii) the referent expressed by the *mit*-PP can be realised as a finite *dass*-clause; and finally, (iii) *drohen* occurs with *zu*-infinitive complements. In this configuration, it can either involve a (iii) control pattern, or a (iv) raising pattern. By contrast, *versprechen* and *verheißen* occur as (i) ditransitive verbs with an accusative NP and a dative NP, (ii) with finite *dass*-clause complements, and, finally, with control *zu*-infinitive complements and raising *zu*-infinitive complements.

2.2.12.1 Transitive and intransitive uses

All of the three verbs under discussion occur as three-place predicates that select an agent argument, a recipient argument and a theme (or perhaps instrument) argument. In any case, the agent argument is realised as a nominative NP and the recipient argument as a dative NP. The remaining argument is represented as a *mit*-PP rather than as an accusative NP in the case of *drohen*. In (482), this argument surfaces as the PP *mit Krieg* ‘with war’. Accordingly, this particular use of *drohen* cannot be considered as a transitive use. By contrast, the third argument is realised as an accusative NP in the case of *versprechen* and *verheißen*. In the examples below, *versprechen* realises its theme argument as the accusative NP *anstrengungslosen Wohlstand* ‘effortless wealth’ (cf. 483), and *verheißen* as the accusative NP *kein grosses Outperformance-Potential* (cf. 484).

Likewise, Colomo (2011: 221) observes that *drohen* and *versprechen* differ in terms of argument structure.

- (482) Kabila drohte unterdessen dem Nachbarland Ruanda
 Kabila threatened meanwhile the neighbour.country ruanda
 mit Krieg, weil es an der Seite der Rebellen in den
 with war because it at the side the-GEN rebels-GEN in the
 Kongo einmarschiere.⁴⁰³
 Kongo invade-SBJV.PRS
 ‘Kabila threatened his neighbour country ruanda with war as it supposedly invades
 the Kongo together with the rebels.’
- (483) Wer dem Volk anstrengungslosen Wohlstand verspricht,
 whoever the people effortless wealth promises
 lädt zu spätrömischer Dekadenz ein.⁴⁰⁴
 invites to Late.Roman decadence in
 ‘Those who promise effortless wealth to the people will yield Late Roman decadence.’
- (484) Der CSFB-Analyst verheißt der Schweizer Börse
 the CSFB-analyst augurs the Swiss Stock.Exchange
 deshalb „kein grosses Outperformance-Potential“.⁴⁰⁵
 therefore no big out.performance.potential
 ‘The CSFB-analyst predicts no big out-performance-potential for the Swiss Stock Ex-
 change.’

As it turns out, the dative NP is not realised in most of the instances found in the corpus. In this respect, examples (482)–(484) illustrated above are rather atypical.

2.2.12.2 *dass*-clauses

Drohen, *versprechen* and *verheißten* occur as three-place predicates which realise their theme argument as a finite *dass*-clause. This merits closer attention, as the three verbs differ in other environments with respect to the realisation of the theme argument. However, whenever the theme argument surfaces as a clausal argument, these differences disappear.

As the instances (486) and (487) indicate, the RECIPIENT argument can once again be represented as a dative NP.

- (485) Er droht aber auch, dass er Ali Sagdas das Geschlechtsteil
 he threatens but also that he Ali Sagdas the sex
 abschneiden und es ihm in den Mund legen werde.⁴⁰⁶
 cut.off-INF and it him in the mouth put-INF will-SBJV.PRS

⁴⁰³ DeReKo: NUN98/AUG.00548 Nürnberger Nachrichten, 07/08/1998.

⁴⁰⁴ DeReKo: BRZ10/FEB.08056 Braunschweiger Zeitung, 16/02/2010.

⁴⁰⁵ DeReKo: E98/MAR.07874 Zürcher Tagesanzeiger, 21/03/1998.

‘But he also threatens Ali Sagats to cut off his sex and to put it into his mouth.’

- (486) *Generell versprechen Union und FDP den Firmen, dass es in
generally promise Union and FDP the enterprises that it in
Zukunft unbürokratischer zugeht.*⁴⁰⁷
future non.bureaucratic goes

‘Generally, the Union and the FDP promise to the enterprises that the procedure will be less bureaucratic in future.’

- (487) *Seinem ehemaligen Salzburger Assistenten Philippe Auguin
his former Salzburger assistant Philippe Auguin
verheißt er, daß er in Nürnberg „ganz sicher ein
promises he that he in Nürnberg very certainly a
,Meisterdirigent‘ wird!”*⁴⁰⁸
master.conductor becomes

‘He promises to his former assistant in Salzburg Philippe Auguin that he will become a master conductor in Nürnberg.’

Once again, the dative argument occurs only fairly rarely, irrespective of the matrix predicate. In most of the instances that can be found in the corpus, the RECIPIENT is not overtly realised.

2.2.12.3 Control infinitives with event modification

Alternatively, *drohen*, *versprechen* and *verheißten* occur as three-place predicates, which realise their theme arguments as *zu*-infinitive complements. As Reis (2005: 126, 2007: 8) and Colomo (2011: 142) indicate, these instances have to be considered as control verbs, since they impose selectional restrictions on their subject arguments. In their terms, these verbs are commissive speech act verbs that involve a subject referent who makes a commitment concerning the state of affairs expressed by the infinitive complement.

In all of the examples (488)–(490), the matrix subject referent intentionally commits the communicative act indicated by the matrix predicate. Accordingly, the subject NP must be an argument of the respective predicate.

- (488) *Er droht ihr, sie in ein Heim zu stecken.*⁴⁰⁹
he threatens her her into a asylum to put-INF

‘He threatens (her) to put her into a children’s home.’

406 DeReKo: NON09/DEZ.14663 Niederösterreichische Nachrichten, 28/12/2009.

407 DeReKo: RHZ09/OKT.14552 Rhein-Zeitung, 17/10/2009.

408 DeReKo: NUN98/FEB.00803 Nürnberger Nachrichten, 10/02/1998.

409 DeReKo: BRZ09/JUL.22822 Braunschweiger Zeitung, 21/07/2009.

- (489) Als seine Mutter im Sterben liegt, verspricht er ihr widerwillig,
 as his mother in dying lies promises he her begrudgingly
 den Jakobsweg zu gehen.⁴¹⁰

the Jakob.Way to go-INF

'When his mother was about to die, he promised her to do a pilgrimage along the way of St. James.'

- (490) Als Gott in Gestalt dreier Männer Abraham und Sara besucht
 as God in guise three-GEN men-GEN Abraham and Sara visits
 und der alternden Frau verheißt, einen Sohn auf die Welt zu
 and the ageing woman augurs a son on the world to
 bringen, bricht sie unwillkürlich in Lachen aus (Gen 18).⁴¹¹
 put-INF breaks she involuntarily in laughs out Gen 18

'When God visited Abraham and Sara in guise of three men and augured to the aging woman that she will give birth to a son she involuntarily burst out laughing (Gen 18).'

Once again, it is possible to realise the recipient argument as a dative NP. However, such cases do not occur frequently in the DeReKo corpus. Further occurrences from corpora are provided by Müller (2002: 55-6)

2.2.12.4 Raising infinitives with event modification

Finally, *drohen*, *versprechen* and *verheißten* occur in configurations in which they exhibit a fairly different interpretation. While all of the uses discussed above belong to the class of commissive speech act verbs, they sometimes appear as uses in which their precise meaning cannot be captured easily. Thus, some authors conclude that they are modal or aspectual auxiliaries. Accordingly, Drosdowski et al. (1984: 94) argue that *drohen* acts as a *modifizierendes Verb*, i.e. as a modifying verb. Yet, for some reason they do not make any mention of an analogous use of *versprechen*. In an earlier edition of the *Duden*-grammar, Grebe et al. (1966: 528), both verbs are documented with a interpretation different from their commissive speech act reading.

As is commonly assumed, this difference in interpretation is reflected in a drastic change in the argument structure as well. Based on the observation made by Bech (1955: 113, 126), most authors, such as Askedal (1997b: 13), Reis (2005: 127, 135, 2007: 21, 32), Wurmbrand (2001: 205), conclude that these uses lack a referential subject argument and the recipient argument. As Colomo (2011: 233) points out, the raising uses of *drohen* and *versprechen* behave very

⁴¹⁰ DeReKo: RHZ07/MAI.13875 Rhein-Zeitung, 14/05/2007.

⁴¹¹ DeReKo: RHZ07/FEB.09600 Rhein-Zeitung, 10/02/2007.

differently from the raising verb *scheinen* in this respect, which can realise its dative object under any circumstance.

As examples (491) and (493) indicate, these verbs can select infinitives that do not involve referential subject arguments. Similar examples are provided by Müller (2002: 55-6) Reis (2005: 135, 2007: 21). Moreover, Reis (2005: 139, 2007: 27) demonstrate that *drohen* is transparent with respect to voice: It will yield the same interpretation no matter whether it embeds a proposition based on an active verb or its passivised counterpart. All of these facts indicate that *drohen* and *versprechen* involve a variant that has to be analysed as a raising pattern.

- (491) Es droht zu regnen, doch das stört die vielen Schwimmer
it threatens to rain-INF but this bothers the many swimmers
an diesem Sonntagmorgen kaum.⁴¹²
on this Sunday.morning hardly
'It threatens to rain but this does not bother the many swimmers on this Sunday morning.'
- (492) Selten war die Kampfkraft der „Bild“-Zeitung so
rarely was the fighting.power the-GEN Bild-newspaper so
beansprucht wie in der vergangenen Woche, als Doktor
challenged as in the passed week when Doktor
Guttenberg zerschossen zu werden drohte.⁴¹³
Guttenberg obliterate-PPP to become-INF threatened
'The fighting power of the „Bild“ newspaper was rarely so challenged as in the past week when Doktor Guttenberg was in threat of being dishonoured.'
- (493) Es verspricht, ein schöner Tag zu werden.⁴¹⁴
it promises a beautiful day to become-INF
'It promises to be a beautiful day.'
- (494) „Juchzet, frohlocket!“ heißt es ganz programmatisch, und das
cheer rejoice calls it very programmatically and the
dargebotene Liedgut verspricht so vielfältig zu sein wie
presented repertoire promises so manifold to be-INF as
des Showmans Kostüme.⁴¹⁵
the-GEN showman-GEN costume
'“Cheer, rejoice!” it says very programmatically and the presented repertoire promises to be as manifold as the showman's costumes.'

412 DeReKo: NUZ09/JUN.02681 Nürnberger Zeitung, 29/06/2009.

413 Spiegel 9/2011, 28.2. 2011, p. 141.

414 DeReKo: HAZ08/MAI.05336 Hannoversche Allgemeine, 29/05/2008.

415 DeReKo: HMP06/DEZ.02074 Hamburger Morgenpost, 21/12/2006.

As Łukasz Jędrzejowski (pers. commun.) has suggested, *verheißen*, due to its semantic affinity to *versprechen*, is another promising candidate for the raising pattern sketched above. And indeed, it is occasionally found in raising-like configurations (cf. 495–496).

- (495) Ein Höhepunkt verheißt das Wochenende vom 22. bis zum
a highlight promises the weekend from 24 until to.the
24. Mai zu werden.⁴¹⁶
24 may to become-INF

'The weekend from 22nd until 24th of May promises to become a highlight.'

- (496) Mit den sechs neuen Vereinen, den beiden Viernheimer Clubs,
with the six new clubs the both Viernheimer clubs
St. Ilgen, Leimen, Bammmental und Treschklingen verheißt es
St. Ilgen Leimen Bammmental and Treschklingen promises it
eine spannende Runde zu werden.⁴¹⁷
a exciting season to become-INF

'With the six new clubs, the two clubs from Viernheim, St. Ilgen, Leimen, Bammmental and Treschklingen, it promises to be an exciting season.'

Unfortunately, due to the low frequency of occurrences, no instances could be found that unambiguously exemplify the diagnostics of a raising verb. The classification as a raising verb is based on mere semantic analogies to the raising verb *versprechen*.

As has been indicated above, the three verbs do not behave in the same way. First of all, there is a subtle difference in the argument structure concerning the realisation of the theme argument. Secondly, it has been observed by Askedal (1997b: 17) and Diewald and Smirnova (2010: 205, 214) that the raising uses of *versprechen* are considerably rarer than the raising uses of *drohen*. According to Askedal, only 12 tokens out of 650 (1.84 %) are raising verbs in the case of *versprechen*. By contrast, *drohen* occurs as a raising verb in 96 cases out of 279 (35.7 %). This contrast calls for an explanation. Thirdly, the raising use of *versprechen* is almost restricted to the selection of the infinitive *zu werden*, cf. Colomo (2011: 237) for a related observation.

Moreover, the three verbs have a couple of characteristics in common. To start with, it has often been remarked that the raising uses of *drohen*, *versprechen* and *verheißen* are restricted to the selection of predicates that refer to an event in the future, cf. Reis (2001: 312 Fn. 40, 2005: 130, 2007: 14) and Colomo (2011: 236).

⁴¹⁶ DeReKo: RHZ09/FEB.23166 Rhein-Zeitung, 25/02/2009.

⁴¹⁷ DeReKo: M06/AUG.65563 Mannheimer Morgen, 19/08/2006.

In this respect, these verbs crucially differ from the epistemic modal verbs discussed above and from the raising verb *scheinen*. Moreover, there are semantically related variants of these verbs that do not select an infinitive complement, as Askedal (1997b: 15), Reis (2007: 14) and Diewald and Smirnova (2010: 194, 208) have illustrated. Sometimes, these patterns are referred to as ‘uses with non-agentive/inanimate subject referent’. Regarding this property, *drohen*, *versprechen* and *verheißen* behave very differently from the traditional epistemic modal verbs, which always require an infinitive complement in order to express an epistemic meaning. Again, *drohen* is by far the most frequent verb in this configuration. By contrast, *versprechen* and *verheißen* only occur occasionally in this type of pattern.

- (497) Nach einem relativ milden und sonnigen Tag gestern, drohen
 after a relatively mild and sunny day yesterday threaten
 dem Urlaubsparadies ab heute neue Unwetter.⁴¹⁸
 the holiday.paradise from today new thunderstorms
 ‘After the relatively mild and sunny day yesterday, the holiday paradise is threatened
 by new thunderstorms today.’
- (498) 5-Tage-Prognose: Das Wochenende verspricht uns kaum Sonne.⁴¹⁹
 5-day-forecast the weekend promises us hardly sun
 ‘5-day-forecast: The weekend does not promise us much sun.’
- (499) Anderes Wetter verheißt uns der Silvestertag.⁴²⁰
 other weather augurs us the new.year.eve
 ‘The New Years Eve promises us a different weather.’

In contrast to their relatives that involve a raising structure, all of the verbs can be found with a dative object. As the interpretation is almost identical, it is somehow surprising that the recipient argument can be realised as long as no infinitive complement is selected. The dative object is most often found with *drohen*, whereas it is rarely realised with *versprechen* and *verheißen*.

As it turns out, the raising uses of *drohen*, *versprechen* and *verheißen* are the result of a rather recent process. The earliest examples of *drohen* with a raising infinitive complement date from the 18th century. In examples (500)–(501), a commissive interpretation is not very plausible.

- (500) O lindre mein Gefühl! – die Brust droht zu zerspringen⁴²¹
 o allay my sentiment the breast threatens to burst-INF

418 DeReKo: M01/NOV.86982 Mannheimer Morgen, 14/11/2001.

419 DeReKo: V99/MAR.11078 Vorarlberger Nachrichten, 05/03/1999.

420 DeReKo: A98/DEZ.83932 St. Galler Tagblatt, 28/12/1998.

'O, allay my sentiment – the breast threatens to burst.'

- (501) Hochher tobt er in hüpfendem Sprung, und zerschmetterte
 high riots he in bouncing jump and shattered
 Waldung // Kracht; doch stets unaufhaltsam enttaumelt er, bis
 forestry cracks yet always inexorably tumbles he until
 er erreicht // Ebenen Grund; dann rollt er nicht mehr, wie
 he reaches even ground then rolls he NEG more how
 gewaltig er andrang: Also droht' auch Hektor
 powerfully he closer.gets accordingly threatened also Hektor
 zuerst, bis zum Ufer des Meeres // Leicht
 first until to.the shore the-GEN sea-GEN easy
 hindurchzudringen der Danaer Schiff' und Gezelte,
 pass the-GEN Danaian-GEN ship and tents-GEN
 Mordend;⁴²²
 murdering

'He is rioting in bouncing jumps and shattered forestry bursts, yet always inexorably tumbles away until he reaches even ground. Then he stops rolling even if he approached in a powerful manner. Accordingly Hektor also threatened to easily pass through murdering to the Danaian ships and tents as far as the shore of the sea.'

An interesting contrast is provided by examples from two different translations of Homer's *Odyssey*. In the late 18th century, Voß employs the raising verb *drohen* to indicate an imminent event (cf. 502). In an earlier translation, more than 200 years earlier, Schaidenreisser uses another circumscription based on the adverb *schier* 'almost' (cf. 503). This could be an indicator that *drohen* with this particular function did not exist in the 16th century.

- (502) Aber da eben jetzo der Ölbaumknittel im Feuer // Drohte zu
 but as just now the olive.pole in.the fire threatened to
 brennen, [...] zog ich ihn eilend zurück aus dem Feuer,⁴²³
 burn-INF pull I it swiftly back out the fire
 'But as the pole of olive threatened to burn in the fire, I swiftly pulled it out of the fire again.'
- (503) Und da der oelbeümin pfal wol erhitzt war/ und schier
 and when the olive-ADJ pole well heated was and almost
 glueend worden⁴²⁴
 glowing became

421 Friedrich Wilhelm Gotter *Elektra*, II, 2, Weimar (1772), (printed in *Gedichte*, vol II, 45).

422 *Illias*, XIII, 140, translated by Johann Heinrich Voß, (1793).

423 *Odyssee*, IX, 140, translated by Johann Heinrich Voß, (1781).

‘And as the pole of olive was well heated and almost started to glow’

These findings correspond to the results of the investigation carried out by Diewald and Smirnova (2010: 271). According to their view, the first unambiguous instances of *drohen* with a raising pattern can be found in the late 18th century. As Diewald and Smirnova (2010: 287) further point out, *versprechen* appears to have undergone the same development much later. They observe the first uses of *versprechen* with a raising pattern starting from the early 19th century. But this may be due to the fact that the raising pattern of *versprechen* is generally much harder to find.

Turning to *verheißten*, the situation reflects the observations made by Diewald and Smirnova (2010: 287). Just as its semantic counterpart *versprechen*, the verb *verheißten* is found as a raising verb in the early 19th century.

- (504) und möge in Hamburg, das einst für die vaterländische Bühne so
and may in Hamburg that once for the Fatherland-ADJ stage so
viel war und so viel wieder zu werden verheisst, nichts den
much was and so much again to become promises nothing the
guten Absichten eines Schröders in den Weg treten!⁴²⁵
good intention a-GEN Schröder-GEN in the way step-INF
‘And may there be nothing that prevents that the good intentions of Schröder become
true in Hamburg which once was so important for the stage of the Fatherland and
which promises to become it again.’

For all of the three verbs, the so-called uses with inanimate subject referents, as illustrated in examples (497)–(499), are an important landmark in their process of grammaticalisation. Before *drohen*, *versprechen* and *verheißten* could acquire their raising pattern, they had already developed non-agentive patterns without infinitive complements. As Diewald and Smirnova (2010: 271) illustrate, *drohen* is documented with non-agentive uses at least from Middle High German onwards. By contrast, *versprechen* could only be found in such configurations in the late 18th century, cf. Diewald and Smirnova (2010: 287).

After having reviewed the origin and the characteristic of these three verbs, the question arises of how these patterns can be captured. A couple of analyses have been proposed. Some authors, e.g. Askedal (1997b: 14) and Wurmbrand (2001: 205), argue that the raising patterns of *drohen* and *versprechen* have to be considered as epistemic modal verbs. As Askedal (1997b: 14) argues, they behave like epistemic modal verbs in that (i) they always select obligatorily coherent infinitive complements, (ii) they fail to licence VP anaphora, (iii) they never occur

⁴²⁴ *Odyssea* IX, p. XXXIX, translated by Simon Schaidenreisser, (1537).

⁴²⁵ Morgenblatt für gebildete Stände N° 16, Freitag 18. Januar (1811), p. 64.

in non-finite forms (bare infinitive, *zu*-infinitive, past participle), (iv) they cannot be used as an imperative, and (v) they do not impose selectional restrictions on their subject argument.

However, on closer inspection, it turns out that the raising patterns *drohen* and *versprechen* (and *verheißten*) behave fairly differently from the traditional epistemic modal verbs. First of all, Askedal's characterisation of these raising uses is not entirely correct. As Reis (2005: 140, 2007: 29) and Colomo (2011: 271) show, *drohen* and *versprechen* do not always occur in configurations that exhibit the word order that is crucial for obligatory coherence. Rather, they exhibit a pattern that could obviously be regarded as an instance of a pattern called "Third Construction". Furthermore, Reis (2005: 133, 2007: 17) and Colomo (2011: 260–265) indicate that raising uses of *drohen* and *versprechen* occur with non-finite forms such as bare infinitives and past participles. Thus, the analogies between these raising verbs and the traditional epistemic modal verbs are by far less striking than Askedal (1997b: 14) suggests.

Moreover, authors like Askedal (1997b: 14) and Wurmbrand (2001: 205) ignore a couple of essential differences between *drohen* and *versprechen* on the one hand, and the traditional modal verbs, on the other. As Reis (2005: 129, 2007: 13) and Colomo (2011: 241–245) demonstrate, they can readily occur in environments from which epistemic modal verbs are excluded or almost excluded, e.g. embedded under a past tense operator and in questions. Furthermore, Reis (2001: 312 Fn. 40, 2005: 130, 2007: 14) and Colomo (2011: 236) have shown that the raising uses of *drohen* and *versprechen* are restricted to the selection of predicates that refer to a future event. As will be demonstrated in Chapter 3, the essential characteristic of epistemic operators is the ability to embed predicates that refer to a present state or to an event in the past. Apart from that, it has been shown above (cf. 497–499) that *drohen* and *versprechen* have uses that are semantically related to the raising patterns but do not involve infinitive complements. In contrast, epistemic modifiers always require some sort of clausal complements such as bare infinitives. Finally, *drohen* and *versprechen* always select *zu*-infinitives rather than bare infinitives. In contrast to *brauchen*, the infinitive particle *zu* cannot be dropped in any context.

An alternative analysis has been proposed by Reis (2005: 140, 2007: 18), who considers the raising uses of *drohen* and *versprechen* as temporal-aspectual verbs. As she points out, they share a couple of characteristics with *beginnen* 'begin', *anfangen* 'begin', *aufhören* 'stop'. More specifically, she shows that all of these verbs exhibit the Third Construction pattern to the same extent. While the traditional temporal-aspectual verbs are specified for the first or the last phase of a particular event, she demonstrates that *drohen* and *versprechen* describe the phase that immediately precedes that event.

This reasoning is plausible, as there are other temporal-aspectual verbs in German that exhibit a similar semantic specification, e.g. *anschicken* ‘to be about to’. However, it has been observed that the core class of temporal-aspectual verbs is rather reluctant to embed passivised infinitive complements, as has been documented by Haider (1993: 244), Reis (2005b: 135 Fn.8) and Colomo (2011: 290). By contrast, the raising uses of *drohen* and *versprechen* are occasionally found with infinitives that are passivised, as is illustrated in example (492). Does this indicate that these verbs cannot be considered as temporal-aspectual verbs? As it turns out, there is a group of temporal-aspectual verbs in German that can also be found with passivised complements. Interestingly, it is precisely the temporal-aspectual verb *anschicken* that is semantically very close to *drohen* and *versprechen*, as it is specified for the phase immediately preceding the event.

- (505) Haider GEN FPÖ schickt sich an, erstmals in der Geschichte an
Haider-GEN FPÖ is.about REFL on first.time in the history at
einer österreichischen Regierung beteiligt zu
a Austrian government participate-PPP to
werden.⁴²⁶
PASS.AUX-INF
‘Haider’s FPÖ is about to participate in an Austrian government for the first time in history.’
- (506) Nun aber schicken sich Pavel Pardo und Ricardo Osorio an, in
now but are.about REFL Pavel Pardo and Ricardo Osorio on in
den Annalen des Ländles verewigt zu werden.⁴²⁷
the annals the-GEN LändleGEN immortalise-PPP to PASS.AUX-INF
‘But now, Pavel Pardo and Ricardo Osorio are about to be immortalised in the annals of the Ländle.’

The existence of examples like (505)–(506) is further support for the analysis developed in Reis (2005: 140, 2007: 18).

Colomo (2011: 290) alternatively suggest that the raising verbs *drohen* and *versprechen*, together with *scheinen* and *pflügen*, which are also raising verbs, constitute the natural class of semi-modal verbs. However, as has been illustrated by Reis (2007: 17) and in Section 2.2.11, *drohen* and *versprechen* differ from *scheinen* in more respects than from the temporal-aspectual verb *anschicken*. At this point, it appears that Reis’ account is the one with the most explanatory power.

⁴²⁶ DeReKo: RHZ00/JAN.14751 Rhein-Zeitung, 27/01/2000.

⁴²⁷ DeReKo: HMP07/MAI.01447 Hamburger Morgenpost, 15/05/2007.

2.2.13 Summary

As has been indicated in Section 2.1.4, the six traditional modal verbs do not constitute a consistent and homogeneous class. In order to find out to what extent it is possible to provide an alternative classification, the previous sections have thoroughly investigated the following 14 elements, which are often considered as modal verbs in German (by various authors).

(507) *können, müssen, wollen, sollen, dürfen, dürfte, mögen, möchte, brauchen, werden, scheinen, drohen, versprechen, verheißten*

Based on the observation that there are not many verbs in German which could be considered as epistemic modal verbs, the availability of an epistemic interpretation became the guiding criterion in the preceding sections. Moreover, it turned out that epistemic modality can be characterised by means of two essential properties: (i) first of all, an epistemic operator indicates that the embedded proposition is not part of the deictic centre's (speaker's) knowledge (CoDeC). Secondly, (ii) epistemic operators can embed predications consisting of an identified subject referent and a predicate that refers to a state that cannot be changed or an event in the past.

There are at least two ways of defining a class of modal verbs based on the concept of epistemic modality. Each of them has a different implication regarding the extension of the class. According to the stronger definition put forth by Öhlschläger (1989: 132), Engel (1996: 463), Diewald (1999: 1) and Reis (2001: 287), it is possible to define a class of modal verbs in German in terms of poly-functionality. This refers to the class of verbs which carry two different types of modality.

(508) Strong definition of modal verbs

A modal verb is characterised by the availability of a circumstantial modal interpretation and an epistemic modal interpretation.

Corresponding to this definition, any verb which exhibits a circumstantial modal interpretation next to an epistemic one would be considered as a modal verb. Any verb which has only a circumstantial or an epistemic reading but lacks the other one would be banned from this class.

Based on the observations made in the preceding Sections 2.2.1–2.2.12, the following distribution of modal readings emerges.

1. **Circumstantial, epistemic and reportative:** *sollen, ?wollen*
2. **Circumstantial and epistemic:** *können, müssen, ?mögen*
3. **Circumstantial and marginally epistemic:** *brauchen*
4. **Only circumstantial:** possibility modal *dürfen, möchte*

5. **Only epistemic:** weak necessity modal *dürfte*, *werden*, *?mögen*
6. **Circumstantial and reportative:** *?wollen*
7. **Not epistemic:** *scheinen*
8. **Not epistemic:** *drohen*, *versprechen*, *verheißten*

In the case study on *sollen* in Section 2.2.6, it was illustrated that epistemic and reportative interpretations are by no means equivalent. Thus, they are carefully distinguished in the remainder of this section. Furthermore, it has been revealed that the subjunctive of the past forms *dürfte* and *möchte* have acquired a non-compositional interpretation and, thus, they have to be analysed as independent lexical elements. Moreover, the traditional preterite present *mögen* is constantly used less and less with infinitive complements and seems to disappear with certain ‘modal’ uses.

At this point, it becomes possible to apply the concept of polyfunctionality to all of the potential candidates that come into consideration for a classification as a modal verb. In doing so, it turns out that the content of the resulting class of modal verbs is fairly different from what is generally expected. There are only two verbs that can be considered as polyfunctional without any restraint: *können* and *müssen*. Apart from that, *brauchen* exhibits a marginally developed epistemic interpretation. Therefore, it would be a rather marginal member of this group. In the case of *mögen* with an infinitive, it is not really clear to what extent it can still be interpreted in a circumstantial way. In contemporary standard written German, this type of interpretation seems to be absent. Aside from its circumstantial interpretation, *sollen* exhibits a very oblique epistemic interpretation, which is only available when the verb bears the morphology of the subjunctive of the past. In addition, it carries a reportative interpretation. Accordingly, it is not clear which status the reportative modality has for the classification. As has been shown in Section 2.2.6, reportative modality substantially differs from epistemic modality in semantic respect. Thus, it cannot be fully equivalent to epistemic modality. If reportative modality is seen to be irrelevant for the definition of modal verbs, then *wollen* cannot be regarded as a modal verb neither, unless one accepts that it involves an epistemic concessive pattern as well, as is suggested in Section 2.2.3. At any rate, there is a whole number of elements that would have to be excluded from the class of modal verbs: *möchte* lacks an epistemic interpretation and there is no consensus to what extent it involves a reportative one. Likewise, the possibility modal verb *dürfen* has no epistemic interpretation. Furthermore, there are verbs that do not have a circumstantial modal interpretation, such as *werden* and the weak necessity modal *dürfte*.

As has been illustrated, the remaining verbs cannot be considered as epistemic as they do not fulfil both of the conditions for epistemic operators stated

above: *scheinen* behaves unexpectedly with respect to the CoDeC, as the speaker occasionally knows that the embedded proposition is false. This is hardly ever the case with epistemic modal verbs that are inflected for the indicative. In contrast, *drohen*, *versprechen* and *verheißten* cannot embed any predication that refers to a present state or past event. As a consequence, these verbs will not be taken into consideration for the definition here.

If the class of modal verbs is defined in terms of polyfunctionality, one needs to be aware that its extent will be much smaller than is generally expected: There are only two perfect members: *können* and *müssen* and a couple of half-hearted members: *sollen*, *brauchen* and *mögen*. Furthermore, this sort of definition in terms of polyfunctionality faces another challenge. Being based on the concept of circumstantial modality, this type of account has to provide a clear-cut definition for circumstantial modality as well. As can be seen, this is by no means a trivial matter. It is far from obvious to what extent it is possible to find a uniform definition for all of the different types that are generally subsumed under this concept: deontic modality, volitional modality, practical modality, the ability readings of *können*, the emotive readings of *mögen*. It should not be too surprising if these subtypes cannot be unified and if some of these subtypes needed to be excluded.

The approach in terms of polyfunctionality implicitly suggests that all of the patterns subsumed under circumstantial modality share some essential characteristics. Yet, it has been illustrated in the preceding sections that each of the verbs investigated behaves in a fairly idiosyncratic way. As can be seen, the idiosyncrasies are dominant and it is not clear to what extent there is any feature that distinguishes them from all of the other verbs. In opposition to this, the concept of epistemic modality can be captured without too much ado.

At this point, the question arises what the benefit of a definition of modal verbs in terms of polyfunctionality is from a descriptive perspective? Given the fact that it would not encompass all of the epistemic verbs, this definition would ignore the striking similarities between the epistemic verbs including *werden* and *dürfte*. First of all, they are semantically fairly homogeneous. Furthermore, they behave syntactically in a very uniform way: All of them select bare infinitive complements and all of them involve a raising pattern.

Probably, it is more promising to abandon this attempt in favour of another approach. Alternatively, one could refrain from considering all of the non-epistemic patterns of the verbs under investigation and uniquely focus on their epistemic interpretations. In contrast to the strong definition, one could assume that a natural class of (poly-functional) modal verbs does not exist. Yet, it has been demonstrated that the epistemic interpretations of the verbs reviewed so far behave in a fairly uniform way. Accordingly, they can easily be grouped in a semantically and syntactically homogeneous class. This approach has a crucial advantage com-

pared to the definition based on polyfunctionality: It puts together all of the elements that indeed behave in an analogous way. Moreover, it is the precondition for any attempt to provide a principled explanation of the relation between the formal and functional peculiarities. In opposition, such an account does not make any statement about all of the non-epistemic uses. And it is fairly doubtful whether there is any fruitful generalisation to be made for these uses.

(509) Weak definition

There is no class of modal verbs but there is a class of epistemic modal verbs.

If the two criteria for epistemic modal operators are acknowledged, this definition will result in the following extension:

(510) *kann, könnte, muss, müsste, sollte, dürfte, mag, braucht nicht, wird*

For the sake of precision, indicative forms are distinguished from the subjunctive of the past forms. As it turns out, they are also homogeneous from a syntactic perspective: All of them select bare infinitive complements and all of them involve a raising pattern. Likewise, Reis (2001: 308) already assumes that these syntactic properties appear to be a prerequisite for a verb in order to express an epistemic modality. This conspicuous connection could be revealing for any attempt to explain the nature of epistemic modality.

Whereas this approach captures the epistemic modal verbs in a more systematic way, it leaves enough space for the diversity of the remaining non-epistemic uses. As is illustrated in the preceding sections, each of the potential modal verbs is ambiguous between several syntactic patterns. And there is no verb which exhibits the exactly the same set of patterns as any other potential modal verb: *können* is used as a transitive verb, as a control verb with event modification, as a raising verb with event modification and as a raising verb with propositional modification. In contrast, *wollen* occurs as a transitive verb, as a verb with finite *dass*-clause, as a control verb with event modification, as a negative polar raising verb with event modification, as a control verb with propositional modification and possibly also as a raising verb with propositional modification. Moreover, *sollen* can be used as a raising verb with event modification and as a raising verb with propositional modification with reportative or epistemic interpretation. A more detailed overview of the different complement types of each potential modal verb is illustrated in Table 2.5.

As already pointed out by Lehmann (1995: 33) and Diewald (1999: 2, 34), these different patterns of a particular verb always represent different stages of its grammaticalisation: The transitive uses reflect the original use of the verb, the control verb uses a younger one and epistemic uses are the most recent ones. Accordingly,

Tab. 2.5: Complement types of potential modal verbs

	predicative phrases	NP _{acc}	(mit-PP)	dass -clause	wenn -clause	(is) ob -clause	control inf. ev	control dir. ev	raising inf. ev	raising dir. ev	control inf. non ev	raising inf. non ev rep	raising inf. non ev
können	-	ABIL	-	-	-	-	ABIL (VOL)	ABIL (VOL)	DEOP, POS	DEOP, POS	-	?	X
mögen	-	EMOT	-	EMOT	(EM), (VOL)	-	(VOL)	(VOL)	?	??	?	?	X
nicht mögen	-	-	-	EMOT	-	-	VOL	VOL	?	?	X	?	X
wollen	-	VOL	-	VOL	-	-	VOL	VOL	EXT	EXT	X	???	X
nicht wollen	-	-	-	VOL	-	-	VOL	VOL	?	?	X	?	?
möchte	-	VOL	-	VOL	-	-	VOL	VOL	?	?	X	?	?
sollen	-	-	-	-	-	-	-	-	DEON	DEON	-	X	-
sollte	-	-	-	-	-	-	-	-	-	-	-	-	X
dürfen/	-	-	-	-	-	-	-	-	DEOP	DEOP	-	-	-
dürfte	-	-	-	-	-	-	-	-	-	-	-	-	X
müssen	-	-	-	-	-	-	-	-	DEON, NEC	DEON, NEC	-	-	X
nicht brauchen	-	-	-	-	-	-	-	-	DEON, NEC	DEON, NEC	-	-	X
werden	X	REQU	-	-	-	-	REQU	REQU	-	-	-	-	X
Scheinen	X	-	-	X	-	-	-	-	FUT	-	-	-	X
	(+ NP _{dat})	-	-	(+ NP _{dat})	-	(+ NP _{dat})	-	-	X	-	-	-	?
versprechen	-	X	-	X	-	-	X	X	?	(+ NP _{dat})	-	-	-
	(+ NP _{dat})	(+ NP _{dat})	-	(+ NP _{dat})	-	(+ NP _{dat})	(+ NP _{dat})	(+ NP _{dat})	X	-	-	-	-
drohen	-	-	X	X	-	-	X	X	-	-	-	-	-
	(+ NP _{dat})	(+ NP _{dat})	(+ NP _{dat})	(+ NP _{dat})	-	(+ NP _{dat})	(+ NP _{dat})	(+ NP _{dat})	-	-	-	-	-

the diversity of these different readings reflects the history of the particular verb. As each verb has a different origin and an individual development, it is not surprising that there are hardly two verbs that have an identical set of patterns. In the case of the verbs considered above, the patterns become the more uniform the more grammaticalised they are. Each element takes up its individual path of grammaticalisation, and in the case of the verbs discussed above, these paths may converge in the end and, finally, they become epistemic modal verbs that select bare infinitive complements and that exhibit raising patterns. Related observations have been made by Lehmann (1995: 25). Therefore, it is much easier to provide a class definition that only considers the epistemic uses than a definition that encompasses other less grammaticalised uses as well.

However, the most important finding that has been revealed by the case studies is the overwhelming diversity of different uses as has been documented throughout the preceding sections. This diversity of the non-epistemic uses poses a challenge for either of the approaches discussed above. Advocates of the strong definition would need to show that at least some of them can be considered as circumstantial modal uses. In turn, it becomes necessary to provide a clear cut definition of circumstantial modality in order to check which of these can be classified as circumstantial. It is fairly likely that there are some uses that cannot be classified as circumstantial uses such as the transitive uses or uses with finite *dass*- and *wenn*-clauses. As for these cases, advocates of the strong definition would need to come up with an explanation for all of those left-over uses. Likewise, the weak decision would need to account for those left-over uses as well. In contrast, it does not need to provide a definition of circumstantial modality that covers as many of the non-epistemic uses.

Given the overwhelming multitude of different patterns and idiosyncrasies, any account needs to be flexible enough to capture this complex network of semantic relations. Specifically, it has to account for two facts. Most importantly, it has to explain how it is possible that all of the verbs under discussion are ambiguous between up to six semantically related patterns. As has been shown by Diewald (1999: 27) and Abraham (2003: 2), the relationships between the different patterns is a diachronic one. There are some patterns that have developed from others. Yet, even the most grammaticalised pattern of a modal verb retains the semantics of the original lexical meaning. This indicates that it should be possible to derive younger, more grammaticalised patterns always from the previous ones. Secondly, the approach has to explain the fact that each verb involves its individual selection of syntactic patterns. An analysis that captures all of the specific uses of one verb does not need to capture all of the uses of another verb.

The most obvious approach to these challenges is one that allows for much variation and specification in the lexicon. A lexicalist theory such as HPSG has

great advantages for this endeavour. Relations between the different patterns can be easily established by means of lexicon rules and type hierarchies.

Summing up, it has been demonstrated that it is not a trivial matter to provide a definition of modal verbs that comprise all of the elements that are generally held as such. Even the promising attempt to define modal verbs in terms of polyfunctionality has turned out to be treacherous. First of all, it faces the burden of proving that there is a homogeneous class of circumstantial modality and that it captures all of the traditional modals. Moreover, it ignores the verbs that only exhibit an epistemic modal interpretation but no circumstantial one, such as *werden* and *dürfte*. Their epistemic uses would be left unexplained. At this point, the question arises what the benefit is of an account in terms of polyfunctionality.

A less spectacular, yet more efficient solution can be attained based on the assumption that there is no homogeneous class of modal verbs. Instead, it can easily be shown that there is a homogeneous class of epistemic modal verbs. In contrast, this type of account does not have to make a statement on all of the non-epistemic uses. At this point, it is not clear whether there are any useful generalisations to be made for the non-epistemic patterns. Rather, it is sufficient to capture the lexical and semantic relations between each of the patterns. Thus, a homogeneous classification is possible if only the epistemic modal verbs are considered. As will be shown in Section 6, it is even possible to derive the reportative uses from the epistemic ones by means of the CoDeC and some additional assumptions.

Finally, it is more important to describe and capture all of the recorded forms, rather than postulating seductive over-simplified generalisations which do not match the empirical evidence. The establishment of a class of epistemic modal verbs is by far less spectacular than assuming the existence of a class of modal verbs. Yet, it is more thoroughly grounded in the data. Perhaps it is the term ‘modal verb’ that has caused all of this confusion. Possibly, it is just an invention that does not match reality. The next section will provide a brief overview of the history of the term ‘modal verb’ and its original motivation.

2.3 The origin of the term *Modalverb*

In the course of the preceding sections, it has turned out that it is a great challenge to provide an intensional definition of the class of modal verbs. These difficulties could be evidence that the concept *modal verb* suffers from internal contradictions. Unfortunately, notions and terms are sometimes confused in the course of history; occasionally, they are reinterpreted in a less exact manner, sometimes they were not precise enough from the beginning. As Butt (2006: 153) illustrates, the well-known term *ergativity* has a spectacular history. Being misinterpreted,

the term *ergative verb* established in the early eighties has developed a meaning that is very far from the original intention. As it turns out, the term *Modalverb* has a remarkable development as well.

The upcoming section will investigate the different definitions of verb classes that concern the six traditional modal verbs. The focus will be on the precise name of the class. Furthermore, the original motivation for the classification will be discussed. As it turns out, there were a number of different terms and conceptions in competition with each other. It is far from clear what precisely caused particular terms to prevail, whereas most of them were forgotten. Furthermore, it will be shown that it is not always the most consistent concept that remains in the scientific memory.

2.3.1 Early grammars: A morphological classification

According to Jellinek (1914: 296), the term *auxiliary* was not used in Latin grammar. It has only been introduced by the French grammarian Pillot in his book *Gallicae linguae institutio* in 1550. Pillot (1550: 21, 24) argues that sometimes in French the use of a *verbum auxiliarium* becomes necessary in order to translate verbs with particular tense morphology from Latin. He discusses two verbs *estre* ('be') and *avoir* ('have'). In much the same spirit, Ölinger (1574: 94) observes that these two auxiliary verbs *sein* ('be') and *haben* ('have') exist in German as well. Aside from that, he observes that *werden* has to be considered as a passive auxiliary in German. Ölinger (1574: 151) also mentions some of the verbs that would be known as modal auxiliaries later in history. As he notes, the five verbs *woellen*, *sollen*, *doerffen*, *koennen* and *moegen* behave unexpectedly in morphological respects. They will not be realised as a *ge*-participle whenever selected by a perfect tense auxiliary, but as an infinitive. Yet, he does not consider them as verbs with a particular grammatical function, or as auxiliaries. At this time, it were, in particular, morphological anomalies that had attracted the attention of scholars. In the same period, Claius (1578: 96) observed that there are nine verbs that lack suffixes in the 1st and 3rd person singular, which causes them to appear monosyllabic: *können*, *mögen*, *woellen*, *sollen*, *wissen*, *taugen*, *thuerren*, *düerfen* and *müssen*. Accordingly, he calls them *verba monosyllaba*. Occasionally, he employs *woellen* to circumscribe the Latin suffix for future tense. Yet, he does not associate these verbs with any particular grammatical function.

Very much like Ölinger (1574: 94), the influential 17th century grammarian Schottel (1663:550) assumes there are three auxiliary verbs in German: *seyen*, *werden* and *haben*. Furthermore, Schottel (1663: 575, 579) notices that *müssen*, *wollen*, *sollen*, *dürfen*, *können* and *mögen* surface as a infinitives rather than past par-

ticiples when they are embedded by a perfect tense auxiliary. Apart from that morphological peculiarity, he treats them together with the group of irregular verbs (*ungleichfliessende Zeitwörter*). What makes it particularly interesting to read Schottel's work is that his own use of language differs from his descriptions. Accordingly, he uses two further verbs with IPP, which he does not mention in his enumeration: first, he uses the raising verb *pflegen* with IPP (cf. Schottel (1663: 243, 1019)) and second, he uses *wissen* with IPP (cf. Schottel (1663: 67, 144)).

Bödiker (1698: 79), another popular and important grammarian, makes a revolutionary assumption. He concludes that two classes of auxiliaries have to be differentiated in German. Firstly, there are three *merkliche Hülfwörter* 'memorable auxiliaries': *sein*, *haben* and *werden*. The second class is called *gleichsam hülfwörter* 'quasi auxiliaries': *muessen*, *sollen*, *wollen*, *moegen*, *koennen*, *duerfen*, *wissen*, cf. Bödiker (1698: 109). Most importantly, his definition is morphologically motivated:⁴²⁸

Drittens ist zu merken/ daß insonderheit diese verba gleichsam *auxiliara*, muessen/ sollen/ wollen/ moegen/ koennen/ duerfen/ wissen/ ein doppelt *participium* haben auf et und en. Oder daß sie wenn ein ander *verbum* dazu koemmet/ als denn im *perfecto* keine *praeposition* ge haben/ sondern dem Infinitivo gleich außgesprochen werden. Als ich muß ich habe gemußt *absolutè*. Aber hergegen wenn ein ander *verbum* (in infinitivo) dazu koemmet/ so heisset es muessen. Ich habe muessen hoeren/ Ich habe muessen strafen. Also: ich kan/ ich habe gekont/ *absolutè*. Aber in dem ein ander *infinitivo* dazu koemmet so heist es koennen: ich habe koennen dencken. Er haette koennen sagen. Also auch: ich weiß/ ich habe gewußt/ *absolutè*. Koemt ein *Infinitivus* dazu/ so heisset es wissen. Er hat wissen zu sagen. Er hat wissen einzuwenden. Du hast es wissen zu verbergen.

Furthermore, Bödiker (1698: 101) acknowledges that *pflegen* 'to be wont to' exhibits the IPP as well, as soon as it is used with a *foleo* interpretation. However, it is not clear why he did not consider it as a 'quasi auxiliary', just as all of the other verbs that exhibit the IPP. Once again, the definition is clearly based on a morphological criterion. Yet, it remains mysterious why Bödiker (1698: 109) decided

428 Thirdly, it has to be noticed that these verbs being virtually *auxiliara*: muessen, sollen, wollen, moegen, koennen, duerfen, wissen. involve two different types of [past] *participium*, ending in et and en. Or whenever another *verbum* joins them, they will not have the *praeposition* ge in *perfecto* [tense] but will be pronounced like the Infinitivo, as ich muß ich habe gemußt *absolutè*. But whenever another *verbum* (in infinitivo) is attached it is realised as muessen. Ich habe muessen hoeren/ Ich habe muessen strafen. Alike: ich kan/ ich habe gekont/ *absolutè*. But as soon as another *infinitivo* is attached it is realised as koennen: ich habe koennen dencken. Er haette koennen sagen. Alike: ich weiß ich habe gewußt *absolutè*. If an *Infinitivus* is attached it is realised as wissen. Er hat wissen zu sagen. Er hat wissen einzuwenden. Du hast es wissen zu verbergen. [Own translation, the highlighted items are already contained in the original text.]

to treat these verbs as ‘quasi auxiliaries’ rather than as usual irregular verbs, just like the other irregular verbs are treated. Hence, an explicit motivation in terms of their function in grammar is missing.

By contrast, Adelung (1782: 772) rejects Boediker’s approach. According to his view, auxiliaries are only those elements which are necessary to circumscribe verbal morphology in Latin, such as tense and passive suffixes. Correspondingly, he only considers *seyn*, *haben* and *werden* as genuine auxiliaries. Furthermore, he explicitly excludes ‘incomplete predicates’ from his concept of auxiliary, such as *wollen*, *mögen*, *sollen*, *lassen*, *müssen*, *können*.⁴²⁹

Nur solche sind Hülfswörter, durch deren Hülfe die zum Muster genommene Lateinische Conjugation umschrieben wird, und deren sind nur drey ‘seyn’, ‘haben’ und ‘werden’, welche insgesamt Intransitiva sind und irregulär conjugiret werden.

‘Incomplete predicates’ are essentially characterised by the fact that they require a further verbal complement, an infinitive.

Summing up, the early descriptions of the six traditional modal verbs can be characterised as follows. Most grammarians from the 16th until the late 18th century assume that there are a couple of auxiliaries in German. There is wide spread consensus about three verbs *sein*, *werden* and *haben*, which are generally regarded as auxiliary verbs. This classification is motivated by the fact that they become necessary in order to translate analytic tenses or passive suffixes from Latin into French or German. Implicitly, these authors assume that these verbs contribute grammatical information, such as temporal specifications, rather than lexical meaning. It is fiercely contested to what extent the traditional modal verbs should be regarded as auxiliaries as well. They have attracted attention due to their morphological anomaly. Yet, none of the authors who advocate a classification as auxiliaries provide a clear motivation for this. In this period, the six traditional modal verbs are not associated with a particular grammatical function.

This does not change when Grimm (1822: 851, 1053) reveals the nature of this class, which attracted a lot of attention in morphological respect. As he illustrates, the singularity of the morphological class *verba zweiter anomalie* ‘verbs of the second anomaly’ is due to their origin: They reflect former preterite tense forms that have acquired present tense meaning. Furthermore, Grimm (1822: 853) has already noted that *wollen* does not belong to this class.

429 Only those verbs can be considered as auxiliaries that correspond to a morphem of inflection in Latin. There are three of those *sey*, *haben* and *werden*, all of them intransitive and exhibit irregular conjugation. [Own translation]

Interestingly, Grimm (1822: 851) introduces the morphological class of *verba zweiter anomalie* in a small section that discusses auxiliaries. According to his view, they are additionally characterised in their high frequency:⁴³⁰

Auxiliaria, d .h. verba, welche sehr häufig gebraucht werden und statt ihrer lebendigen bedeutung abstracte begriffe annehmen, tragen gewöhnlich solche unregelmäßigkeiten an sich.

Even if Grimm (1822: 851) discusses the preterite presents and the former subjunctive of the past *viljan* in the context of auxiliaries, he does not attribute any particular grammatical function to them. Until this time, the traditional six modal verbs are only considered as a class in morphological respects. Usually, other preterite presents are also considered. Yet, these verbs are not associated with any specific grammatical functions, yet.

Other overviews of the treatment of the six traditional modal verbs in early grammars were proposed by Jellinek (1914: 296), Öhlschläger (1989: 19–21) and Johnen (2006) with different results and focuses. Redder (1984: 303–329) and Öhlschläger (1989: 21) provide an extensive overview of the discussion in the 20th century.

2.3.2 Karl Ferdinand Becker (1836): From a morphological classification to a grammatical one

The description of the auxiliaries in German suggested by Becker (1836: 174–186) is one of the crucial landmarks in the history of the term *modal verb*. Whereas former definitions were only motivated by their morphological anomaly, Becker associates these verb with a particular grammatical function and justifies their status as auxiliary verbs. Moreover, he is the first author who tries to provide a systematic semantic description of this class. In doing so, he discovered a whole range of phenomena.

A couple of years ahead of Becker, Heyse (1822: 402) makes the first attempt to provide a functional motivation for the definition of a modal auxiliary like class. As he assumes, there are various classes of auxiliaries in German. Among them, there are seven *Huelfsverba welche den Modus umschreiben* ‘auxiliaries which circumscribe mood’: *dürfen, können, lassen, mögen, müssen, sollen, wollen*. A further criterion for his concept of auxiliary-hood seems to be their requirement for a fur-

430 Auxiliaries, that is verbs which are very frequently used and which assume abstract concepts rather than their vital meaning, usually exhibit such anomalies. [translation JM]

ther infinitive complement, as illustrated in Heyse (1822: 403). Yet, he does not become very explicit in this matter.

By contrast, Becker (1836: 176 §91) explicitly argues that every language has its proper *Huelfsverben des Modus* ‘auxiliaries of mood’. Their function is to express the possibility or necessity of the embedded predication. In other words, any modal verb is either a verb that expresses a possibility or a necessity. Furthermore, Becker (1836: 178) concludes that there are three different types of possibilities and necessities that an auxiliary of mood can express: physical, moral and logical. In his main classification, he considers *können*, *dürfen* and *mögen* as possibility verbs and *müssen*, *sollen* and *wollen* as necessity verbs. Apart from that Becker (1836: 182, 1841: 222) explicitly regards the Acl verb *lassen* as an auxiliary of mood, as it can express both a necessity (causative) reading and possibility (permissive) reading. Apart from that, Becker (1836: 177 §91) explicitly notices at some earlier point that *brauchen* is an auxiliary of mood. For some reason, he did not consider it in the general classification in §92 and §93. Interestingly, it appears in the second revised edition in this classification, in which it is treated as verb of a moral necessity, cf. Becker (1842: 220 §91, 224 §93).

The morphological aspect appears to be less important for Becker’s definition. There are only scarce references to the morphological peculiarity of the verbs he considered. At one point, Becker (1836: 176 §91) remarks that the auxiliaries of mood display an anomalous conjugation pattern, which is due to their development: They are past forms that have acquired present tense meaning. In doing so, he is the first grammarian that does not focus on the morphology of these verbs. The fact that Becker (1836) does not mention their morphological anomaly should arouse suspicion. And indeed, in ignoring the morphological nature of the six traditional modal verbs, he avoids a couple of contradictions that would become apparent otherwise. First of all, he considers two verbs as auxiliaries of mood that neither have a preterite present origin, nor adopt a corresponding morphological paradigm: *lassen* and *brauchen*, as is illustrated in Becker (1836: 177 §91, 1836: 182, 1841: 222, 1842: 220 §91, 224 §93). Apart from that, his definition also faces challenges in semantic respect. Building on the assumption that modal verbs express possibilities and necessities, Becker (1836: 178) cannot properly capture epistemic *duerfte*, which he considers as a verb that expresses a probability. In his definition, Becker adopts a view that is fairly exceptional for a grammarian of his time. This could be due to the fact that he was not educated as a grammarian, but rather as a physician, who only developed his linguistic interest when he was older than 30. Even if his definition may suffer from inconsistencies, he nevertheless contributed a couple of ground-breaking discoveries, which enabled him to provide a description of these verbs that was much more efficient than those put forth by his contemporaries.

Likewise, Heinrich Bauer (1827: 93) assumes in the first volume of his grammar *Vollständige Grammatik der neuhochdeutschen Sprache* that there are various types of *Hülfszeitwörter* ‘auxiliaries’ in German. Aside from *haben*, *sein* and *werden*, the incomplete predicates such as *können*, *sollen*, *müssen* can also be considered as such. He becomes more explicit in the third volume of his grammar. Following the work of Becker, Bauer (1832: 489–492) concludes that there are seven verbs that can be considered as *Huelfsverben des Modus*.

Another important definition has been developed by Schoetensack (1856: 269, 293). Apart from the consensual auxiliaries *haben*, *sein* and *werden*, there are various verbs which he considers as auxiliaries as well. According to Schoetensack (1856: 291), *bleiben* ‘stay’, *stehen* ‘stand’, *kommen* ‘come’ and *gehen* ‘go’, have to be treated as auxiliaries as well. Furthermore, he suggest to consider the AcI verbs and the temporal-aspectual verbs as auxiliaries too. In most of the cases, he does not provide a grammatical or functional motivation for his classification. Accordingly, his concept of auxiliary remains fuzzy. As can be seen, the selection of infinitive complements plays an important role for his definitions. In a section on irregular verbs, Schoetensack (1856: 267, 269) regards six verbs as *Huelfsverben* ‘auxiliaries’ *können*, *wissen*, *mögen*, *sollen*, *müssen*, *dürfen*. These verbs are identical to the remnants of the class of preterite presents, which are still in use in New High German, including *wissen*. As he emphasises, *wollen* is not part of this class, as it has not undergone the same development. Seemingly, the driving force behind this definition is one that is based on diachronic morphology. In a subsequent section, Schoetensack (1856: 293) introduces the class of *modale Hülfsverben* ‘modal auxiliaries’ comprising seven verbs: *mögen*, *wollen*, *können*, *sollen*, *müssen*, *dürfen* and *lassen*. After the nomenclature defined by Becker (1836: 176), that is a further step towards the contemporary term ‘modal verb’. In opposition to the previous classification, *wissen* is excluded from the class and *wollen* and *lassen* are integrated. Yet, Schoetensack (1856: 297) acknowledges that *lassen* belongs to a different inflectional pattern than most of the other ‘modal auxiliaries’. Accordingly, Schoetensack’s term ‘modal auxiliary’ appears to be motivated in a semantic or grammatical way. Yet, he does not become very explicit about this matter. In another context, Schoetensack (1856: 558) remarks that modal auxiliaries in German are sometimes used to translate and substitute mood. But they do not systematically replace mood, since they also inflect for the subjunctive. This could be a hint that his term ‘modal auxiliary’ is based on a functional motivation. Apart from that, Schoetensack (1856: 295) considers the verb *brauchen* as an ‘auxiliary’ that is used to negate *sollen*. At this point, it remains unclear whether he considers it as a ‘modal auxiliary’ or some other auxiliary. Finally, Schoetensack (1856: 298): discusses the IPP. In this context, he uses the more general term *Zeitwort* ‘verb’ rather than *Huelfsverb* ‘auxiliary’. This group also contains elements which he has char-

acterised as auxiliaries in a previous section: *hören, heißen, sehen, helfen, lassen, sollen, wollen, mögen, dürfen, müssen, wissen, können, fühlen, lehren* and *lernen*.

As has been shown, Schoetensack (1856) uses the term ‘auxiliary’ in an inflationary manner. In most cases, it is not evident what particular characteristic he associates with it. At some point, he seems to motivate the class of modal auxiliaries in a functional way. This class is almost identical with the six remaining preterite presents including *wissen*, which form a homogeneous group in morphological respect, and which he only considers as ‘auxiliaries’. At this point, it remains mysterious how the class of preterite presents and the class of ‘modal auxiliaries’ relate to each other, according to the view taken by Schoetensack (1856). Moreover, it is evident that his conception suffers from the same conflict as Becker’s definition: on the one hand, he tries to motivate the class in terms of morphological characteristics and on the other hand, he suggest a semantic definition of the class based on the concepts necessity and possibility. Yet, the two motivations do not converge. The morphological part of this definition yields another extension than the semantic part.

Much in the spirit of Becker (1836) and Schoetensack (1856), Vernaleken (1861: 94), a grammarian with descriptive ambitions, postulates a class of *modale Hilfsverben* ‘modal auxiliaries’ which encompasses six elements: *sollen, müssen, mögen, können, dürfen, wollen*. His definition deserves closer attention, as he uses a term that is almost identical to the contemporary use and moreover he suggests an extension that precisely corresponds to the traditional six modal verbs. As he argues, the term *Modalität* ‘modality’ refers to the morphological anomaly of these verbs and their ability to express a *Nothwendigkeit, Möglichkeit und Zulässigkeit des ausgesagten* ‘necessity, possibility and permissibility of a proposition’. As this indicates, Vernaleken’s approach is a strong simplification. In opposition to his two predecessors, he ignores the semantically related verbs *brauchen* and *lassen* in his description. Apart from that, it remains to be shown that these six verbs fulfil his semantic requirement.

Before Vernaleken, Friedrich Bauer (1850: 102 §166), whose grammar is the predecessor of the *Duden* grammar, already suggested a class of *Hilfszeitwörter* ‘auxiliaries’, which comprises the six traditional modal verbs *wollen, können, mögen, sollen, müssen* and *dürfen*. Yet, Bauer (1850: 30 §66) is by far less explicit in his motivation and seems to be primarily interested in their irregular morphology and refers to them as *abweichende Verben* ‘deviate verbs’. Yet, he appears to have a functional criterion in mind as well as he explicitly compares them to *werden*, which is employed to circumscribe future tense.⁴³¹

Der Inf. mit *werden* steht zur Umschreibung des Fut. In ähnlicher Weise steht er bei den Hilfszeitwörtern *wollen, können, mögen, sollen, müssen, dürfen*.

Beginning with Becker (1836), definitions of modal auxiliaries appeared that were not solely grounded on morphological aspects. Some of the authors of that period associated these morphologically anomalous verbs with a very homogeneous meaning. According to their assumption, each of the verbs either expresses a necessity or a possibility. As it turns out, the set of verbs with preterite present morphology is not congruent with the set of the verbs that express a necessity or a possibility. All of these accounts that are based on this double motivation suffer from the same inconsistencies. Most of the authors ignore the apparent contradictions.

The increasing importance of the semantic motivation is reflected by the nomenclature that has been introduced by Becker (1836). Subsequently to his ground-breaking work, the class is called ‘auxiliary of mood’ and later ‘modal auxiliary’. These terms almost correspond to the standard term used in contemporary grammars of German: *Modalverb*.

2.3.3 Blatz (1896)

In the late 19th century, it is generally accepted that there are more auxiliaries than *haben*, *sein* and *werden*. Most of the grammarians assume that there is at least one other class, which is called modal auxiliaries or auxiliaries of mood. In this period, a further interesting development took place in the late 19th century. When Blatz (1896) published the third edition of his grammar, he discusses a class of verbs that he refers to as *Modalverba* ‘modal verbs’. According to the view held in Blatz (1896: 538 §154), this class encompasses the five preterite presents *können*, *mögen*, *dürfen*, *müssen*, *sollen* and the two verbs *wollen* and *lassen*. In a brief remark, Blatz (1896: 542) also considers *brauchen* as a *Modalverb*. According to his selection of verbs, he favours a definition that is semantically motivated. Moreover, he states that they have a similar function as grammatical mood, yet, they are more specific in their interpretation.

This deserves closer attention, as he does not use this expression in the preceding edition of his grammar. In the second edition, Blatz (1880: 649 §396) chooses the term *Hilfsverben des Modus* ‘auxiliaries of mood’ and in an earlier section *Formzeitwörter der Aussageweise*, which corresponds to a ‘germanised’ version of the original Latin terms, cf. Blatz (1880: 267).

As can be seen, something made Blatz change his mind between the year 1880 and 1896, which lead him to using the term *Modalverb*. Yet, it remains fairly mys-

431 The infinitive with *werden* is used to circumscribe future tense. In a similar manner, it is used with the auxiliaries *wollen*, *können*, *mögen*, *sollen*, *müssen*, *dürfen* [own translation]

terious what incidence or influence this could have been. One of the major suspects is of course Henry Sweet, who published his influential *New English Grammar. Logical and Historical* in 1891. As the subtitle indicates, the investigation is grounded in an explicit logical interest. This leads to the conclusion that he could be the origin of a new terminology that follows the tradition of by (modal) logics. Yet, Sweet (1891: 421) turns out to be rather conservative in his nomenclature as far as auxiliaries are concerned. First of all, he is not very consistent in his choice, he alternates between the terms ‘anomalous verbs’ and ‘preterite presents’ (*can, dare, may, must, ought, shall, will*) acknowledging that *need* also fits into that paradigm, having lost its 3rd P -s and taking the negation particle *not*.

At another point, he employs the term ‘chief auxiliaries’ referring to the elements *be, have, do, will, shall* and *may*. The latter, he characterises as auxiliary of permissive mood as in ‘*May you be happy!*’. In a preceding section, Sweet (1891: 108) discusses various instances of periphrastic mood and the corresponding auxiliaries such as *would*, the auxiliary of conditional mood *should*, the auxiliary of compulsive mood *to be+INF* and the auxiliary of permissive mood *may*. As this indicates, Sweet (1891) does not use a terminology that is influenced by modal logic and he is certainly not the one who has inspired Blatz in his nomenclature.

2.3.4 George O. Curme

Another grammarian who takes a related approach is the American George O. Curme. Decades after being a visiting scholar in Berlin in 1896, he published his influential *A Grammar of the German Language*. Curme (1922: 317) introduces a class of ‘auxiliaries of mood’ that encompass the six traditional modal verbs: *dürfen, können, mögen, müssen, sollen* and *wollen*. Even if it is homogeneous from a morphological perspective, Curme (1922: 318) is aware that *wollen* is not a real preterite present and that there is a further preterite present that is not part of this class: *wissen*. As he argues, the latter cannot be considered as a ‘modal auxiliary’, as it does not exhibit the IPP-effect, and as it fails to embed bare infinitive complements. In its extension, Curme’s class is analogous to the one defined by Vernaleken (1861: 94). Yet, Curme (1922) is inconsistent in his use of the designation: sometimes, he refers to this verb class as ‘past present verbs’, sometimes as ‘auxiliaries of mood’ and sometimes as ‘modal auxiliaries’. Apart from that, Curme (1922: 318) delivers a systematic description of each individual verb, which includes discussions of the epistemic uses of *dürfte, können, mögen, müssen* and the reportative use of *wollen* and *sollen*. This characterisation, by and large, reflects the one that was provided by Becker (1836), except that *lassen* and *brauchen* are not considered.

Curme (1922: 318) does not become very explicit as far as the motivation of his definition is concerned. Considering the extension of his class, it appears that morphological reasons are dominant. This is further reflected by the fact that the modal auxiliaries are discussed in the context of irregular verbs. Yet, Curme seems to assume that the class can be motivated on the basis of independent functional or grammatical reasons. This becomes more evident in his *English Grammar* when Curme (1931: 393) discusses the function of modal auxiliaries in English:

As subjunctive forms lost their endings modal auxiliaries were pressed into service to express the same ideas [...] they ceased to be verbs and are now in reality mere grammatical forms to color the statement.

In this statement, the function of modal auxiliaries in English is identified as a means to express mood. But as English differs from German in that respect, one should avoid premature conclusions about what the functional motivation of Curme's definition of German modal auxiliaries could be.

2.3.5 Braune, Paul and Behaghel: The decline of the semantic motivation

At the same time, a new tradition arises among the positivist Neogrammarians, focusing on the morphological aspects of the verbs under discussion here, rather than functional or grammatical ones. Their particular interest might be due to their explicit historical interest. In his *Old High German grammar*, Braune (1886: 252, 259) limits himself to the morphological development of the *praeteritopraesentia* and *wollen*, which developed from a former subjunctive of the past form. He does not make any comment about a semantic or functional motivation. This might be partially caused by the fact that most of the traditional six modal verbs behaved in a different way in Old High German. Moreover, historical semantics is always a very speculative endeavour, too speculative for the positivist Neogrammarians.

Some of the subsequently published grammars of New High German follow this tradition, e.g. Wilmanns (1906: 92–99 §51–§55), Sütterlin (1910: 232, 240) and Paul (1917: 262 §190–§195). The three of them adopt the term 'preterite present' and they confine themselves to the morphological anomalies of this class. Apart from that, they discuss the development of the former subjunctive of the past *wollen*.

In a similar way, Sanders (1908: 222) focuses on the formal peculiarities of these verbs. In contrast to the other grammarians discussed here, he does not consider the traditional modal verbs as a separate class. Rather, he assumes that they constitute a class together with all of the verbs that exhibit the IPP in German.

According to his view, all of these verbs should be regarded as auxiliaries: *dürfen, heißen, helfen, hören, können, lassen, lehren, lernen, machen, mögen, müssen, sehen, sollen, wollen* and occasionally *brauchen, pflegen, suchen* and more rare *empfinden, erblicken, finden, fühlen, schauen, wissen* and *zeigen*. Similarly to the other approaches sketched here, he does not provide any functional or grammatical motivation.

Finally, Behaghel (1924: 309) does not pay so much attention to this group of verbs. In a section on auxiliaries, he refers to them as *Hilfsverben, die ein Dürfen, Können, Sollen, Wollen bezeichnen* ‘auxiliaries that refer to a permission, possibility, obligation or a wish’. Interestingly, his semantic characterisation is neither exhaustive nor systematic. Furthermore, he does not provide any motivation for his classification. In a subsequent section, Behaghel (1924: 368), once again, employs the term *Hilfsverben* ‘auxiliaries’ *dürfen, können, mögen, müssen, sollen, wollen*, when he notes that they all exhibit the IPP-effect. Furthermore, he acknowledges that *brauchen* manifests the IPP-effect as well. However, Behaghel does not become explicit about the nature of this verb. Likewise, the term *Hilfszeitwort* ‘auxiliary’ is used for these verbs in the *Trübners deutsches Wörterbuch* edited by Götzke and Mitka (1939).

Most of these definitions that evolved in the early 20th century refrain from providing a grammatical or functional motivation. Either they are solely motivated on morphological grounds, or the grammatical motivation remains implicit. There are analogies to the research on modal auxiliaries in English at that time. Jespersen (1917: 92–96) enumerates the relevant elements yet without labelling them with a specific term. At some later point Jespersen (1917: 94) refers to the pattern *mustn’t* as a ‘prohibitive auxiliary’.

In the late thirties, the foundations were laid for a grammar which became the most popular one after World War II, when Basler (1935) edited the first *Duden* grammar. It is basically grounded on Friedrich Bauer’s *Grundzüge der neuhochdeutschen Grammatik für höhere Bildungsanstalten*, which was published in 1850. After 17 successful editions in thirty years, it was revised by Konrad Duden and republished in 1881, as the 18th edition of *Grundzüge der neuhochdeutschen Grammatik für höhere Bildungsanstalten und zur Selbstbelehrung für Gebildete*. As already demonstrated above, Bauer (1850: 30 §66, 102 §166) assumes that there is a class of auxiliaries in German that consists of the six traditional modal verbs. In this respect, Bauer’s description did not undergo any substantial change, at least until the ‘12th edition for catholic schools’, cf. Bauer (1870: 64 §66, 163 §167). However, in a footnote he refers to single verbs as *Hilfszeitwörter des Modus* ‘auxiliaries of mood’, cf. Bauer (1870: 158 §165 Fn.). Likewise, the subsequent version edited by Bauer and Duden (1887: 69 §66) adopts, in essence, the descriptions given in earlier editions. There are only minor revisions concerning the termino-

logy. In the section on morphology, these verbs are called *unregelmäßige Verba* ‘irregular verbs’, rather than *abweichende Verben*, as in the earlier editions. Furthermore, Bauer and Duden (1887: 69 Fn.1) notice in a small footnote that these verbs plus the verb *wissen* constitute a class that is called *Praeterito Praesentia* and that essentially exhibits the IPP.

In his terminology, Basler (1935: 89) avoids Latin expressions and, accordingly, chooses a denomination that is purely German *Hilfszeitwörter der Rede-weise*. In contrast to the original predecessor Bauer (1850: 102 §166), he suggests a class extension which contains the six traditional modal verbs including *lassen*: *können*, *mögen*, *wollen*, *dürfen*, *sollen*, *müssen* and *lassen*. A considerable criterion for the classification proposed by Basler (1935: 94) seems to be the availability of the IPP-effect. Yet, he acknowledges that there are two more verbs which are found with this pattern: *heißen* and *sehen*. Moreover, he remarks that *hören*, *helfen* and *lernen* are also found with IPP-morphology; yet, in these cases, this is the result of a misunderstood assimilation (*‘In falsch verstandener Angleichung’*). Basler (1935) obviously adopted this view from Bauer and Duden (1887: 69 Fn. 1), who provide an almost identical formulation. However, their evaluation deserves attention, as it is in conflict with the evidence provided by Kurrelmeyer (1910), who demonstrated that precisely *hören* was one of the first verbs which exhibited the IPP in Late Middle High German. Moreover, Basler (1935: 111) argues that they are preterite presents except for *lassen*.

As has been demonstrated, Neogrammarians return to a consistent definition. This is due to their particular interest in phenomena which can be clearly observed. Accordingly, their classifications are based on purely morphological grounds. The functions of the relevant verbs are largely ignored. This is also reflected in the term that is employed in these grammars. The expression *praeterito praesentia* refers to the morphological development of these verbs, rather than their function or role in grammar. This perspective was adopted by several of the major grammarians in the early 20th century. Other authors remain very superficial and intuitive, as far as the grammatical motivation of their definition is concerned. Terms that contain a reference to mood or modality become rare again.

2.3.6 Gunnar Bech (1949)

It is a term-paper that Gunnar Bech wrote when he was a student that later became on the maybe most influential contribution to the contemporary reasoning on modal verbs in German after it has been published in 1949.⁴³² The study entitled *Das semantische System der deutschen Modalverben* ‘The semantic system of the German modal verbs’ is frequently cited for a couple of achievements. Firstly,

Bech (1949) has reintroduced the term *Modalverb*, and second, he pleads for a class of modal verbs that comprises the six verbs *wollen*, *sollen*, *dürfen*, *mögen*, *müssen* and *können*. He is the first one to combine this particular term with the six modal verbs. As the title already indicates, Bech's main interest is the semantics of these six verbs. Although they exhibit an analogous morphology, this fact does not receive much attention in his study. His major objective is to argue that these six verbs together constitute a 'semantic system'. In these respects, he can be regarded as the father of the traditional six modal verbs in German.

As with many studies on grammar in earlier times, Bech (1949) has not documented his references to other studies. Correspondingly, it remains fairly speculative which parts of his investigations are of his own achievement and which adoptions from other surveys. Yet, it is not very likely that he, being still a student, reinvented the wheel in every detail. Moreover, he was supervised in Copenhagen by a couple of influential scholars, such as the structuralist Louis Hjelmslev, and it is not clear to what extent this term-paper reflects the perspectives of his teachers. Finally, there are four striking parallels to various preceding studies most notably to the ones that have been carried out by Becker (1836), by Schoetensack (1856), by Vernaleken (1861: 94) and by Blatz (1900).

As far as the name of the term is concerned, there are not too many influences that come into consideration. Prior to Bech's work, only a few more investigations can be found that have used the precise term *Modalverb*: The grammar written by Blatz (1896) and Rossmann (1908). Similar terms, such as 'modal auxiliaries' or 'auxiliary of mood', are employed by Curme: 318, (1922: 318, 1931) and Kirchner (1940). It is fairly likely that Bech was familiar with Curme's grammars, as he explicitly quotes them in a subsequent study, cf. Bech (1963: 292). Yet, it remains mysterious what precisely caused him to adopt this term that had previously not been used very frequently.

Moreover, there are similarities with respect to the extension of the suggested class. As has been illustrated above, classes that encompasses the six members are not very frequent. Previous authors who have suggested an extension of this type are Bauer (1850: 102 §166), Vernaleken (1861: 94) and Curme (1922: 371).

Apart from that, the extensive case studies presented in Bech (1949) are strikingly reminiscent of the descriptions provided by Becker (1836) and Schoetensack (1856). This concerns for instance the analysis of *sollen* as a verb of external volition.

432 A short biography of Gunnar Bech is provided as a preface of the reprint of Bech's (1955/57) *Studien über das deutsche Verbum infinitum* published by Niemeyer in Tübingen in 1983.

Finally, the way Bech (1949) motivates his definition is by and large analogous to the one put forth by Becker (1836: §90–§93). The latter argues that all of the eight verbs he has considered express either a necessity or a possibility, including the volitional verb *wollen*, which he analyses as a verb that expresses an inner necessity. In contrast to Becker, Bech (1949) only considers six verbs as relevant for his definition, leaving aside *lassen* and *brauchen*. Moreover, Bech (1949: 38) arranges them in a structuralist feature matrix consisting of a couple of feature oppositions such as ‘necessity/possibility’ and ‘subject referent is identical/not identical to the modal source’. This matrix should justify the existence of this modal verb class consisting of its six members. In essence, Bech’s analysis is Becker’s description in a structuralist guise. Furthermore, Bech (1949) managed to establish a concept that seemed both plausible and simpler than most of those that were preceding – even if it might suffer from essential contradictions and inconsistencies. Yet, it remains mysterious what exactly made him adopt the rare term *Modalverb* and what caused him to abandon the verbs *brauchen* and *lassen*, which have originally been considered as auxiliaries of mood.

In his *Kurze deutsche Syntax*, Dal (1952: 107) does not provide an extensive discussion of the modal verbs. He contents himself with mentioning that there are six *modale Hilfsverben* that precisely correspond to the selection made by Bech (1949). In a subsequent section, Dal (1952: 145) briefly remarks that these verbs can be used to circumscribe subjunctive of the past.

Much in the spirit of Bech (1949), Welke (1965) advocates a class of ‘*Modalverben*’ that comprises the same six verbs as Bech suggested. In contrast, Welke (1965: 11) provides a classification in terms of syntactic characteristics. According to him, the traditional six modal verbs are those verbs that (i) obligatorily select bare infinitive complements, (ii) require subjects of the infinitive that are co-referent with the matrix subject and (iii) exhibit no semantic restriction with respect to their infinitive complement. As he argues, this characterisation yields exactly the traditional six modal verbs. In a brief remark, he acknowledges that this definition would also include *tun* and *werden*. Finally, Welke (1965: 12) concedes that any syntactic classification comprising the traditional six modal cannot be achieved without making arbitrary decisions. However, Welke’s investigation happened to support and strengthen Bech’s analysis in the end.

2.3.7 The *Duden* grammar

For some mysterious reason, German grammars that have been published after World War II seem to suffer from amnesia. The most popular ones edited by Grebe (1959: 83) and by Griesbach and Schulz (1960) adopt the term *modal verb* and as-

sume that this class only encompasses six items. In opposition to its immediate predecessor Basler (1935: 89), Grebe (1959: 83) does not consider *lassen* as a modal verb anymore. As none of these grammars makes an explicit reference in the respective sections on modal verbs, one can only speculate about possible influences. Yet, the precise choice of the terms and the class extension could be very revealing. In previous studies, the term and the class extension have not been used very frequently. As Bech (1949) and Bech (1951) was the first who combined both of them, it seems to be fairly likely that he is the major reference for the two grammars. For later grammars, the first comprehensive monograph on modal verbs published by Welke (1965) becomes another influential point of reference.

In the first edition of the *Duden* grammar edited by Grebe (1959: 83), the denomination of the verb class is not yet consistent. In an earlier section on auxiliaries, they are referred to as *modifizierende Verben* ‘modifying verbs’. Later, in the major section dedicated to these verbs they are introduced as *Modalverben*, which comprise the traditional six verbs, cf. Grebe (1959: 485). Finally, Grebe (1959: 486) remarks that *brauchen* can be used in a similar fashion. The entire treatment of the modal verbs does not exceed a couple of small paragraphs in this first edition.

In the second edition of the *Duden* grammar edited by Grebe et al. (1966: 528), the sections on modal verbs have not undergone any substantial changes except for the observation that *brauchen* exhibits the IPP-effect when used with an infinitive complement, cf. Grebe et al. (1966: 131) referring to Kolb (1964).

In opposition to that, the third edition of the *Duden* grammar edited by Grebe et al. (1973: 66) contributes a comprehensive section on modal verbs, in which the term *Modalverben* is systematically used. Once again, it is assumed that the class comprises the traditional six members. Following the spirit of Welke (1965), a couple of characteristics are given in which the modal verbs are claimed to differ from all of the remaining verbs: (i) they select bare infinitive complements, (ii) they are preterite presents, (iii) they exhibit IPP, (iv) they can select the infinitive of the perfect and (v) they convey an additional meaning. Yet, the authors concede that a clear-cut delimitation is not possible. Finally, Grebe et al. (1973: 72) makes mention of the epistemic modal interpretation for the first time.

In a similar manner, the fourth edition edited by Drosdowski et al. (1984: 94–105) has undergone a considerable revision. The section dedicated to the modal verbs has been extended from a couple of paragraphs in the first two editions to 12 pages in the fourth edition. Hermann Gelhaus, the author of that section, reveals all of his sources encompassing the work of Bech (1949), Kolb (1964), Welke (1965), Fourquet (1970) and other research literature from that period. Drosdowski et al. (1984: 94) characterise modal verbs as verbs that modify the content of another verb. Moreover, it is argued that (i) they select bare infinitive complements, (ii) they cannot occur as imperatives and (iii) they withstand passivisation. Apart

from the traditional six modal verbs, *brauchen* receives attention as well. It is considered as a close relative of the modal verbs. Finally, Drosdowski et al. (1984: 112) notice that *lassen + sich* is a pattern that concurs with the modal verbs.

In the fifth edition edited by Drosdowski et al. (1995: 92–104), there is once again a proper section on a class of modal verbs, which encompasses the traditional six members. The content has not undergone any substantial changes with respect to the preceding edition.

Once again, the seventh edition edited by Eisenberg et al. (2005: 562) was subject to comprehensive revisions. The main article has been written by Cathrine Fabricius-Hansen, who makes explicit reference to Bech (1949), Kratzer (1981), Brünner and Redder (1983) and Zifonun (1997). In contrast to the previous edition, the content has been reduced and is presented in a more condensed form. Whereas the designation of the class has remained the same, there are some minor changes in the extension. At the outset, the traditional six modal verbs are only mentioned. However, in the subsequent lines *brauchen* is explicitly considered as a modal verb. Moreover, Eisenberg et al. (2005: 566) notice that *möchte* can be regarded as an independent item as it is occasionally used with a proper infinitive. Eisenberg et al. (2005: 563) provide a description that has a semantic focus. As the authors conclude, modal verbs are characterised by three essential modal dimension: modal force, modal base and the modal source.

By contrast, the grammar edited by Griesbach and Schulz (1960: 41, 65) is grounded on different assumptions. According to their view, the class of modal verbs is characterised by the selection of bare infinitives and availability of two modal interpretations: modal and epistemic. Thus, Griesbach and Schulz (1960: 41, 65) provide a definition that is functionally motivated. It is the first grammar that stresses the singularity of the epistemic modal interpretations. Yet, they conclude that the class only encompasses the six traditional members.

As this section has revealed, the two popular grammars edited by *Duden* and Griesbach and Schulz (1960) have employed the term *Modalverb* since the early sixties. As they have used it throughout the present, it is fairly likely that they have played an important role in the proliferation of this expression that was almost not in use before Bech's (1949) monograph had been published. In a similar fashion, Redder (1984: 306) has shown that the grammars which have been published after the second world war differed with respect to the term they employed: *Modalverb* or *modales Hilfsverb*. The former term could only prevail in the seventies.

2.3.8 Summary

As the preceding sections have demonstrated, the German concept of *Modalverb* suffers from an essential inconsistency. According to a view held by most contemporary authors, the class should be motivated by two different types of criteria: by morphological criteria and by functional or grammatical criteria. However, the set of verbs that exhibit the morphology typical of modal verbs is not co-extensive with the set that displays modal semantics.

It was widely observed in the 16th century that some of the verbs which are known today as *modal verbs* behave in an awkward way. Accordingly, it has frequently been suggested that they form a class that has to be treated separately from the other verbs. Yet, the precise term and the extension of this class differs from author to author across the centuries, as is illustrated in Table 2.6.

Being the more salient feature, it was initially the morphological anomalies that attracted the attention of grammarians. In the descriptions that were published prior to those provided by Becker (1836: 174–186), the definitions were motivated on the basis of morphological features. Bödiker (1698: 109) was the first author who argued that all of the six preterite present verbs, plus the former subjunctive of the past *wollen*, should be considered as auxiliaries, which is evidently motivated by the fact that all of these verbs can take infinitive complements. Yet, an explicit functional or grammatical motivation is missing for this classification.

It was not until more than one hundred years later that Becker (1836: 176) explicitly provided such a motivation. As he argues, these verbs are particular in that they express either a possibility or a necessity. Accordingly, they should be considered as auxiliaries of mood. In his characterisation, the morphological aspect becomes less crucial, although Becker (1836: 176) stresses that these verbs are characterised by a morphological anomaly. As the class definition is primarily motivated in functional terms, he finishes by widening his scope and integrates two verbs into his class that behave analogously in semantic respect: *lassen* and *brauchen*. This line of reasoning has been adopted by a number of grammarians in the 19th century. Yet, most of them have tacitly excluded *brauchen*. However, their approach results in a class which is inconsistent in both respects, morphologically and functionally. Finally, Blatz (1896: 538) introduced the term *Modalverba* for reasons that remain mysterious.

In the late 19th century, authors working in the tradition of the Neogrammarians, such as Braune (1886: 252), returned to a purely morphological definition. Accordingly, they dropped the functionally motivated designation ‘modal auxiliary’ and replaced it by a term that is solely based on morphological grounds: ‘praeterito praesentium’.

Tab. 2.6: Different extensions of the term *Modalverb* across the centuries

author	term	thuerren	taugen	wissen	müssen	können	sollen	mögen	dürfen	wollen	lassen	brauchen
Ölinger (1574)	(IPP)											
Claus (1578)	verba monosyllaba	x	x	x	x	x	x	x	x	x	x	x
Schottel (1663)	(IPP)			(x)								
Adelung (1782)	unvollständige prädicata											
Grimm (1822)	verba zweiter anomalie			x								
Heyse (1822)	verba zweiter anomalie	x										
Bauer H. (1832)	Huelfsverb des Modus											
Becker (1836)	Huelfsverb des Modus											x
Bauer F. (1850)	Hilfszeitwörter											
Bauer F./Duden (1887)	Hilfszeitwörter											
Schoetensack (1856)	modale Huelfsverb			x								
Vemateken (1861)	verba zweiter anomalie											
Blatz (1896)	Modalverba											
*Braune (1886)	praeteritopraesentia	x	x	x	x	x	x	x	x	x	x	x
Wilmanns (1906)	Präterito Präsens	x	x	x	x	x	x	x	x	x	x	x
Sanders (1908)	among Hilfsverb with IPP			(x)								
Sütterlin (1910)	Präterito Präsens		x	x	x	x	x	x	x	x	x	(x)
Paul (1917)	Präterito Präsens	x	x	x	x	x	x	x	x	x	x	
Curme (1922)	auxiliaries of mood, modal auxiliaries											
*Behagel (1924)	Hilfsverb											
Basler (1935)	Hilfszeitwort											
Bech (1949)	Modalverb											
Dal (1951)	modale Hilfsverb											
Duden (1959)	Modalverb											
Griesbach/Schulz (1960)	Modalverb											
Welke (1965)	Modalverb											
Duden (1966)	Modalverb											
Duden (1973)	Modalverb											
Duden (1984)	Modalverb											
Duden (1995)	Modalverb											
Duden (1998)	Modalverb											
Duden (2005)	Modalverb											

In the late forties, Bech (1949) once again came up with a definition that is primarily functionally motivated. As his class only encompasses the traditional six modal verbs, other verbs with an analogous interpretation, such as *brauchen* and *lassen*, are ignored. Thus, from a strictly functional perspective, the choice made by Bech (1949) is not plausible. Furthermore, he is the one who re-introduced the term *Modalverb*, which was not much in use before and already forgotten. As can be seen, it is mainly due to the popular *Duden* grammars, and the grammar published by Griesbach and Schulz (1960: 65), that the term *Modalverb* in combination with the traditional six members could proliferate in the second half of the 20th century.

As Bech (1949) is reluctant to reveal his references, it will remain a matter of speculation what authors were his major influences. Yet, it is an established fact that the term *Modalverb* had hardly been employed before him, except for Blatz (1896: 538) and Rossmann (1908). Moreover, the number of authors who suggested that the class encompasses exactly the traditional six verbs is fairly limited: before Bech, this extension was only promoted by few prominent authors, such as Bauer (1850: 102), Vernaleken (1861: 94) and Curme (1922: 317). In most descriptions until the thirties, *lassen* was considered as a modal auxiliary as well.

With the functionally motivated definition proposed by Griesbach and Schulz (1960: 65), the availability of an epistemic interpretation became relevant as an essential characteristic of the modal verbs. In the subsequent period, the attention shifted to other verbs that exhibit an epistemic interpretation as well, such as *werden*, which was analysed as a modal verb by Welke (1965: 12) and Vater (1975: 110). The importance of this feature further increased until it became the core of the definition, e.g. in the accounts based on poly-functionality advocated by Öhlschläger (1989: 132), Engel (1996: 463), Diewald (1999: 1) and Reis (2001: 287). As this definition is rather functionally motivated than morphologically motivated, some of the authors adapt the extension of the class accordingly. As *werden* and *brauchen* exhibit an epistemic interpretation as well, Engel (1996: 463) and Reis (2001: 287) integrate these verbs into their respective classes of modal verbs.

With the increasing attention that modal verbs received in the seventies and eighties, other items came into consideration that had not been part of the traditional class of modal verbs. Kolb (1964), Folsom (1968) and Scaffidi-Abbate (1973) illustrated that *brauchen* behaves like a modal verb in almost all of the essential aspects. Likewise, Öhlschläger (1989: 7) and Wurmbrand (2001: 137, 183, 224) demonstrate that *möchte* cannot be interpreted as subjunctive of the past of *mögen*; rather, it has to be treated as an independent lexical item. In the same spirit, Wurmbrand (2001: 137, 224) suggests that *dürfte* is a verb of its own type.

In Section 2.2.13, it turned out that it appears impossible to establish a homogeneous class of modal verbs in German. The question thus arose to what extent these inconsistencies are due to the term and the concept *Modalverb*. After having reviewed their origin and development, it was seen that the history of the term, and the concept of *Modalverb*, is dominated by the conflict between a morphologically motivated definition and a functionally motivated definition. Starting with Becker (1836), most authors try to provide a definition that is motivated both morphologically and functionally. Yet, this approach does not succeed, as the class of verbs with the morphological anomaly is not co-extensive with the class of verbs that exhibit a functional peculiarity. Interestingly, most authors who provide a 'double motivation' for the class of modal verbs in German do not provide an explicit justification for this move. Thus, they fail to prove that each of the suggested verbs fulfils indeed both morphological and functional criteria. Any of the accounts mentioned above can be characterised as being either (rather) morphologically motivated, or (rather) functionally motivated.

From this it follows that there are only two consistent ways of unifying the German verbs under consideration. Firstly, it is possible to provide a definition that is merely grounded on morphological aspects. Such a classification will result in a class equivalent to the preterite presents described by the Neogrammarian authors, such as Braune (1886: 252). Alternatively, one could provide a definition that only takes into consideration functional or grammatical aspects. Yet, as functional properties are often not too salient and their classification is often subject to controversies, the second approach faces even more challenges. As was revealed in Section 2.2.13, there is at least one functional criterion that is a fairly salient characteristic: The availability of an epistemic interpretation. Accordingly, the most fruitful solution appears to be to restrict the attention to the epistemic interpretations of all of the verbs considered here. As the resulting group is homogeneous in semantic respect, they could be regarded as a semantic or functional class. Even if the associated members do not constitute a morphological class, there are other formal properties they have in common: all of the epistemic modal verbs select bare infinitive complements, and all of them are raising verbs.

In opposition to the modal auxiliaries of English, a definition that is motivated by both morphological and functional aspects will not result in a consistent class in German. Accordingly, it appears to be more appropriate to content ourselves with a class definition that is limited to the epistemic interpretations. At the same time, advocates of the more traditional definitions of modal verbs are confronted with the question of what benefit they would gain in cleaving to a class that is maybe elegant but not consistent and homogeneous.

Yet, this does not mean that the anomalous morphology and the peculiar function do not have any impact on each other. As far as grammaticalisation is con-

cerned, it is clear that ‘anomalous’ forms are more likely to grammaticalise than ‘regular’ ones. A similar observation was made by Grimm (1822: 851), who noticed that verb forms that are frequent or exhibit an anomalous morphology act often as auxiliaries.

Even if it is not possible to define a class of modal verbs in German, one can compare the kinship of the verbs under consideration. As it turned out, these verbs exhibit a couple of properties which are very rare, or at least not very frequent. For instance, a genuine epistemic interpretation is only attested with the verbs discussed here. Likewise, only the six traditional modal verbs, plus *brauchen* and *lassen*, exhibit an obligatory IPP-effect, as was illustrated in Section 2.1.1.2. Furthermore, the number of verbs that carry a preterite present or related morphology is fairly limited. This affects, in particular, the two first criteria: The 3rd person singular indicative without a suffix, and the vowel alternation between the singular present indicative forms and their plural counterparts. By contrast, the vowel alternation between the infinitive and the past tense stem is a characteristic that affects most of the irregular verbs as well. In more detail, Eisenberg et al. (2005: 491–502) lists more than 190 irregular verbs that display a vowel alternation between the present stem and the past stem. Apart from the verbs considered here, there are only a few subject-to-subject raising verbs in German, such as *scheinen*, *drohen*, *versprechen*, and *pflügen*. In a similar vein, the number of subject-to-object raising verbs is fairly limited (*sehen*, *hören*, *fühlen*, *haben*, etc.). As was mentioned in Section 2.1.2.1, example (20), there are only about ten more verbs in German that select bare infinitive complements, besides the potential modal verbs. Moreover, the number of predicates that select verbless directive phrases, other than the verbs investigated here, does not exceed ten, as was pointed out in Section 2.2.1.4.

Thus, there are at least eight properties that cluster around the potential modal verbs and that are not regularly found with other verbs. These features could be helpful to determine the degree of kinship between the verbs listed in Table 2.7. Now, we could assume that features which are only observed with the potential modal verbs are more crucial for a definition. The column with the header “relevance” displays the number of verbs that exhibit the property apart from the verbs under consideration. Likewise, features that occur with only one or a few of the potential modal verbs would carry less weight.

From a contemporary perspective, it might appear awkward that *lassen* was considered a modal auxiliary across centuries. Yet, it is more related to the traditional six modal verbs than it may seem at first glance. As has been demonstrated by Reis (2001: 308), *lassen* exhibits an epistemic interpretation, under certain conditions. Obviously, this use is restricted to environments in which *lassen* is part of a directive speech act.

- (511) A: Was kostet das Buch wohl?
 what costs the book maybe
- (512) B: Lass es mal 100,- kosten.
 let-IMP it PART 100 COST-INF
- A: 'How much could the book be?'
- B: 'Let it be 100,- /Assume that it costs 100,-.'

In the example given by Reis (2001), the epistemic use of *lassen* embeds a stative predicate, which is reminiscent of the other epistemic modal verbs considered in the previous section. Moreover, the speaker expects the embedded proposition not to be part of the deictic centre's knowledge. In this respect, *lassen* behaves just as canonical epistemic modal verbs do. Interestingly, the deictic centre is not identical to the speaker here. Rather, it is linked to the addressee, who is grammatically encoded as the subject argument of *lassen*. A similar context shift can be observed with the reportative modal verbs *wollen* and *sollen*.

Finally, it merits closer attention that *lassen* occurs more often than ordinary lexical main verbs and exhibits a frequency similar to other traditional modal verbs such as *können*, *müssen* or *wollen*, as was illustrated in Section 2.1.4. At this point, the striking analogies between *lassen* and the traditional six modal verbs cannot be denied anymore.

Even if this approach would enable us to determine the degree of kinship between the potential modal verbs, it will hardly ever result in a clear-cut class of modal verbs. Accordingly, it is favourable to refrain from using the traditional concept of modal verbs.

In this section, it has been shown that the traditional class of modal verbs is by far less natural than it appears. Moreover, this concept suffered from an essential conflict since its first introduction. It was claimed that it is motivated by morphological characteristics and functional characteristics. Yet, there has always been a discrepancy between these two classes of criteria. A definition that is based on the morphological anomaly will result in another class extension than a definition which is grounded on merely functional aspects.

Furthermore, it has been illustrated that throughout the centuries there have been different terms and different extensions. Therefore, it should not be too surprising if the term *Modalverb* in combination with the six to eight verbs investigated here was not the last word in this debate.

Tab. 2.7: Features relevant for a definition of the class *Modalverb*

relevance	criterion	wissen	müssen	können	mögen	sollen	wollen	dürfen	lassen	brauchen	möchte	dürfte	werden
0	epistemic reading (F)		x	x	x	x	?		(x)	x		x	x
0	obligatory IPP (M)		x	x	x	x	x	x	x	x			
0	3 rd p.sg without suffix (M)	x	x	x	x	x	x	x		(x)			
0	vowel alternation sing./ plur. (M)	x	x	x	x	x	x	x					
<10	subj-to-subj raising (S)		x	x	x	x	x	x				x	x
<10	subj-to-obj raising (S)			x	x	x	x	x	x				
10	bare infinitives (S)		x	x	x	x	x	x	x	x	x	x	x
10	verbless directional phrases (S)		x	x	x	x	x	x	x	x	x	x	x
20	expression of possibility/necessity (F)		x	x	x	x	x	x	x	x	x	x	x
>190	vowel alternation infinitive/past (M)	x	x	x	x			x					

3 The nature of epistemic modality

As was shown in Chapter 2, the most essential property of the so-called *modal verbs* is their ability to encode epistemic modality. In this chapter, two important characteristics will be explored: (i) the ability of epistemic modal verbs to embed predications consisting of an identified subject referent and a predicate that refers to a state that cannot be changed, or a predicate that refers to an event in the past, and (ii) the condition that the embedded proposition must not be part of the speaker's knowledge. In order to determine the precise nature of epistemic modal verbs, they will be compared to their circumstantial counterparts. The leading question can be phrased as follows: Why can epistemic modal verbs embed such types of predications? And why can circumstantial modal verbs not do so?

As will be shown, circumstantial modal operators are event modifiers which are restricted to the modification of predicates that can be interpreted as events. Epistemic modifiers, by contrast, are not subject to this requirement, since they are modifiers of propositions or speech act events, as has been suggested by Hacquard (2006: 138, 2010: 152). An analogous contrast can be observed with other modifiers that are ambiguous between an epistemic and a non-epistemic version, e.g. reportative modal verbs, causal clauses, conditionals, manner adverbs and locative adverbials. Finally, the investigation will be extended to related modifiers which are ambiguous between similar types of event related interpretations and clause related interpretations, such as concessive clauses, purpose clauses and temporal clauses.

3.1 Types of modification

As shown in Section 2.2, epistemic modal verbs are characterised by the ability to embed predications linking an identified individual and a predicate which refers to a state that cannot be changed, or a predicate that refers to an event in the past. It was shown that a circumstantial interpretation is ruled out in such cases. A similar observation has been made by Abraham (1991), Abraham (2001), Abraham (2005) and Leiss (2002) for German and by Barbiers (2002: 59, 61) for Dutch.

All verb forms with an epistemic interpretation are attested in configurations in which they select stative predicates that refer to states which cannot be changed, and in configurations in which they select a predicate that refers to an event in the past: *kann* (cf. 513–514), *könnte* (cf. 515–516), *muss* (cf. 517–518), *müsste* (cf. 519), *will* (cf. 520), *dürfte* (cf. 521–522), *sollte* (cf. 523), *mag* (cf. 524–525), *braucht nicht* (cf. 526–527) and *wird* (cf. 528–529):

<https://doi.org/10.1515/9783110411027-003>

- (513) Es kann sein, dass mich die neue Frisur ein wenig schneller und
 it can be that me the new haircut a little faster and
 besser gemacht hat¹
 better made has
 'It is possible that my new haircut enabled me to be faster and better.'
- (514) So kann die Motte in Wipshausen einmal ausgesehen haben.²
 so can the Motte in Wipshausen once out.look-INF have-INF
 'The Motte in Wipshausen may have looked like this once upon a time.'
- (515) Nach Zeugenangaben könnte ein etwa 30 Jahre alter Mann
 after witness.reports can-SBJV.PST a about 30 year old man
 der Täter sein.³
 the culprit be-INF
 'According to witness reports, the culprit could be a man that is about 30 years old.'
- (516) Das Mädchen hatte im Garten gespielt und plötzlich Blut
 the girl had in.the garden played an suddenly blood
 gespuckt. Die Angst der Mutter: Das Kleinkind könnte
 spewed the fear the-GEN mother the toddler can-SBJV.PST
 Glas verschluckt haben.⁴
 glass swallow-PPP have-INF
 'The girl was playing in the garden and suddenly she started spewing blood. The
 mother was afraid the toddler could have swallowed glass.'
- (517) Schreckliche Angst muss der kleine Junge gehabt haben, der
 terrible fear must the small boy have-PPP INF that
 am Samstag in ein tiefes Loch gefallen ist.⁵
 at Saturday in a deep hole fall-PPP is
 'The boy who fell into the deep hole on Saturday must have been terribly frightened.'
- (518) Er muss der Täter sein, denn sein Sperma lässt sich in ihrem
 he must the culprit be-INF as his sperm lets REFL in her
 Unterleib nachweisen.⁶
 abdomen prove-INF
 'He must be the culprit because his sperm could be found in her abdomen.'

1 DeReKo: HAZ09/DEZ.03174 Hannoversche Allgemeine, 21/12/1009.

2 DeReKo: BRZ09/AUG.04565 Braunschweiger Zeitung, 11/08/2009.

3 DeReKo: RHZ08/JUN.01622 Rhein-Zeitung, 03/06/2008.

4 DeReKo: BRZ09/AUG.03524 Braunschweiger Zeitung, 08/08/2009.

5 DeReKo: BRZ09/JUL.16635 Braunschweiger Zeitung, 06/07/2009.

6 DeReKo: NUZ09/JUN.00298 Nürnberger Zeitung, 04/06/2009.

- (519) Die Kleidungsstücke deuten dann auch darauf hin, dass es sich
 the clothes indicate then also to.it at that it REFL
 um einen Mann gehandelt haben müsste.⁷
 about a man deal-PPP have-INF must-SBJV.PST
 ‘The clothes indicate that it must have been a man.’
- (520) Der etwa 69 800 Mark teure Cross Country [...] will
 the about Mark expensive cross country wants
 zwar kein Geländewagen sein, doch in seiner Nähe
 although no all-terrain.vehicle be but in his closeness
 sehen ihn die Volvo-Leute schon.⁸
 see him the Volvo-people yet
 ‘Though the Cross Country, which costs 69 800 Mark, may not be an all terrain vehicle,
 it is considered by the Volvo people as something comparable.’
- (521) Das erste Bild des Babys dürfte Schätzungen von
 the first picture the-GEN Baby-GEN might estimations by
 Paparazzi zufolge rund fünf Millionen Dollar (vier
 paparazzi according.to about five millions dollar four
 Millionen Euro) wert sein.⁹
 million Euro worth be-INF
 ‘According to estimations by paparazzis, the first picture might have a value of about
 five million Dollars (four Million Euros).’
- (522) Der Mann dürfte im Schlaf gestorben sein, da die Beamten
 the man might in.the sleep die-PPP be-INF as the officers
 ihn im Bett gefunden hatten.¹⁰
 him in.the bed found had
 ‘The man must have died while beeing asleep, as the officers found him in his bed.’
- (523) Selbstbewusstsein sollte eigentlich auch bei der SG
 self.confidence shall-SBJ.PST actually also by the SG
 Unnertal in Massen vorhanden sein.¹¹
 Unnertal in masses present be-INF
 ‘SG Unnertal should actually have plenty of self confidence.’

7 DeReKo: RHZ09/JUN.24827 Rhein-Zeitung, 29/06/2009.

8 DeReKo: M97/712.03322 Mannheimer Morgen, 10/12/1997.

9 DeReKo: NUZ06/MAI.02995 Nürnberger Zeitung, 29/05/2006.

10 DeReKo: BVZ09/OKT.01155 Burgenländische Volkszeitung, 14/10/2009.

11 DeReKo: RHZ99/AUG. 20012 Rhein-Zeitung, 28/08/1999.

- (524) Mit 8 Milliarden Euro Kosten mag Nabucco teuer sein – sie
with 8 billion Euro costs may Nabucco expensive be she
wird sich bezahlt machen.¹²
will REFL pay-PPP make-INF
'With its costs of around 8 billion Euros, Nabucco may be expensive – nevertheless,
it will pay off.'
- (525) Feminismus mag in der modernen Gesellschaft wirklich
Feminismus may in the modern society indeed
etwas Wichtiges bewirkt haben, aber braucht man diese
something important cause-PPP have-INF but needs one this
Bewegung auch in der Kirche?¹³
movement also in the church?
'Even if Feminism may have caused important changes in modern society, is it a ne-
cessary movement also in the church?'
- (526) Der „Outer“, wie man klar erblickt, ist nunmehr regelrecht
the outer as one clearly sees is now downright
verrückt. Denn was er sagt, gesteht er ein, braucht überhaupt
crazy as what he says confesses he in need at.all
nicht wahr zu sein¹⁴
NEG true to be-INF
'The outer has gone downright crazy, as one can clearly see. Since what he says
doesn't need to be true at all anymore, as he confesses.'
- (527) Wir haben die Telekom längst gebeten, vor Ort
We have the Telekom long.ago asked at place
nachzusehen. Das braucht Herr Kunz gar nicht gemerkt zu
after.to.look-INF this need Mister Kunz INTN NEG notice-PPP to
haben, weil der Techniker dafür nicht unbedingt
have-INF because the technician therefore NEG necessarily
ins Haus muss¹⁵
into.the house must
'We already asked the Telekom company to check his connection long ago. Mister
Kunz may not have necessarily noticed it because the technician does not need to
enter the house to do so.'

12 DeReKo: NON09/JUL.05420 Niederösterreichische Nachrichten, 13/07/2009.

13 DeReKo: RHZ09/MAI.08761 Rhein-Zeitung, 11/05/2009.

14 DeReKo: O95/SEP.86494 Neue Kronen-Zeitung, In den Wind gereimt, 02/09/1995

15 DeReKo: NUN06/NOV.02580 Nürnberger Nachrichten, 23/11/2006.

- (528) Der Leser wird wohl den wackeren Komponisten Gluck
 the reader will probably the brave composer Gluck
 kennen, vornamens Christoph Willibald, einen
 know-INF, with.first.name Christoph Willibald a
 Oberpfälzer.¹⁶
 upper.Palatinate
 ‘The reader will probably know the composer Gluck, whose first name is Christoph Willibald, from Upper Palatinate.’
- (529) Es wird schon einen Grund gehabt haben, warum die
 it will already a reason have-PPP have why the
 Eisbärin ihre Jungen gefressen hat.¹⁷
 ice.bear.lady her offspring eaten has
 ‘There will be a reason why the polar bear has eaten her offspring.’

Given that Section 2.2.6 has provided evidence that epistemic modality differs substantially from reportative modality, the reportative interpretations have not been included above. Yet, it has turned out that they behave in an analogous manner. Whenever *wollen* and *sollen* select stative predicates that refer to states which cannot be changed, or predicates that refer to an event in the past, only a reportative interpretation is possible, while any volitional or circumstantial reading is blocked.

- (530) Badhapur ist ein Sadhu, ein Weiser, Gerechter. 106 Jahre will die
 Badhapur is a Sadhu, a sage righteous 106 years wants the
 hagere Gestalt mit dem langen grauen Haar schon alt sein.¹⁸
 rawboned figure with the long grey hair already old be-INF
 ‘Badhapur is a Sadhu, a wise man, a religious man. This haggard form with long grey hair already claims to be 106 years old.’
- (531) Sieben Packerl Rotwein will er vor dem Prozess
 seven packets red.wine wants he before the process
 konsumiert haben.¹⁹
 consume-PPP have-INF
 ‘He claims to have consumed seven packets of red wine prior to the process.’

¹⁶ DeReKo: O98/AUG.75935 Neue Kronen-Zeitung, 04/08/1998.

¹⁷ DeReKo: NUN08/JAN.00722 Nürnberger Nachrichten, 08/01/2008.

¹⁸ DeReKo: NUN99/OKT.02110 Nürnberger Nachrichten, 23/10/1999.

¹⁹ DeReKo: NON09/JUL.08001 Niederösterreichische Nachrichten, 15/07/2009.

- (532) Tom Cruise und Katie Holmes sind geschockt. L. R. Hubbard (kl. Tom Cruise and Katie Holmes are shocked L R Hubbard small F.) soll Suris Vater sein.²⁰
 picture shall Suri-GEN father be-INF
 ‘Tom Cruise and Katie Holmes are shocked. L. R. Hubbard is claimed to be Suri’s father.’
- (533) Horst Seehofers Ex-Geliebte Anette Fröhlich (35) soll den Horst Seehofer-GEN ex-lover Anette Fröhlich 35 shall the CSU-Chef laut „Bunte“ zuletzt in Berlin „regelmäßig und CSU-head according.to Bunte recently in Berlin regularly and lange“ besucht haben.²¹
 long visit-PPP have-INF
 ‘According to the “Bunte”, Horst Seehofer’s ex-lover Anette Fröhlich is claimed to have regularly visited the CSU head in Berlin frequently and for long periods.’

A similar observation has been made for Dutch by Barbiers (2002: 59, 61), who remarks that a circumstantial interpretation becomes impossible if the modal verb embeds a predicate that refers to a state that cannot be changed and when the subject NP is a name. Moreover, Palmer (1990: 45) observed that deontic modals cannot embed past related propositions as deontic modals are performative.

Likewise, Raynaud (1977: 22) shows that epistemic modal verbs have a strong preference to select stative predicates. Investigating her corpus, which comprises 6000 modal verbs, she demonstrates that 90 % of the epistemic occurrences of modal verbs select a stative predicate or the copula *sein*. Furthermore, she illustrates that epistemic readings occur far less frequently than their circumstantial counterparts. The percentage of epistemic interpretation differs from verb to verb: *mögen*: 13 %, *müssen*: 10 %, *können*: 3.9 %, *sollen*: 2.5 %, *wollen*: 0.8 % and *dürfen/dürfte*: 0.1 %.

As has been demonstrated in this section, there is solid and sound evidence that circumstantial and epistemic modal verbs differ with respect to their selectional restrictions. Whereas circumstantial modal verbs are limited to the selection of predicates that refer to some sort of event, epistemic modal verbs tolerate the selection of predicates that refer to a state that cannot be changed or that refers to an event in the past. How can this be accounted for?

²⁰ DeReKo: HMP08/JAN.00616 Hamburger Morgenpost, 08/01/2008.

²¹ DeReKo: HMP09/JUN.01135 Hamburger Morgenpost, 14/06/2009.

3.2 Circumstantial modal verbs as event modifiers

According to Kratzer (1995: 126) and Maienborn (2003: 106), there are two types of predicates: The first type contributes a (Davidsonian) event argument, and the second does not. Even if the two authors do not agree on where exactly and how the boundary between the various classes of predicates should be drawn, they both assume that predicates referring to highly abstract states do not carry an event argument. In opposition, event and process predicates do contribute such an argument.

On closer inspection, it turns out that both authors assume that predicates referring to states that cannot be changed do not involve an event argument. This observation is crucial for the understanding of epistemic and circumstantial modality. As has been demonstrated above, circumstantial modal verbs fail to embed such predicates, whereas epistemic modal verbs are perfectly acceptable in this type of environment. Being restricted to the selection of predicates that contribute an event argument, circumstantial modal verbs could be considered as event modifiers which are restricted to an event that will only be completed posterior to the Time of Utterance. Similar suggestions have been made by Ziegeler (2006: 83) and Maché (2008: 403). This type of analysis is reminiscent of the account developed by Enç (1996: 354), who argues that deontic (circumstantial) modal verbs access the time arguments of their embedded predicates and shift them to the future. Likewise, Barbiers (2002: 59) has demonstrated, based on data from Dutch, that circumstantial modal verbs require complements that refer to events or states that can be changed. In any other case, an epistemic interpretation will be forced. Alternatively, this could be related to the *Prohibition Against Vacuous Quantification* as stated by Kratzer (1995: 131), which postulates the urge of a quantifier to bind a variable. In a similar fashion, one could conclude that event modifiers require a predicate which carries an event argument. By contrast, epistemic modal operators are propositional modifiers or even speech act modifiers that modify assertions. This distinction is reminiscent of the one suggested by Bech (1949), who assumes that circumstantial modal verbs aim at the realisation of the predication encoded by the infinitive complement, whereas epistemic modal verbs aim at the reality or validity of the embedded predication. A similar analysis has been suggested by Colomo (2011: 63).

As was demonstrated in Section 2.1.2.1, such semantic selectional restrictions for predicates which embed bare infinitive complements are fairly common in German. Welke (1965: 11 & 22) and Zifonun (1997: 1253-4) have pointed out that *bleiben* 'stay' is restricted to the selection of stative predicates

However, it is important to stress that epistemic modal verbs are not restricted to the selection of stative predicates. Even if the data collected by Raynaud

(1977: 22) leads to the conclusion that epistemic modal verbs exhibit a striking preference for stative predicates, there are instances that embed eventive or future oriented predicates as well. This was already demonstrated by Curme (1931: 411) for *may* and *might*. In a similar vein, Leech (1971: 68) found that epistemic *may* obtains future reference whenever it selects an eventive predicate. Finally, Fritz (1991: 46) shows that epistemic modal verbs in Contemporary German can embed predicates that refer to past, present or future time intervals.

Yet, there are some instances of epistemic modal verbs that exhibit temporal restrictions. As Hamida Demirdache and Gilian Ramchand (pers. commun.) have pointed out, the English epistemic modal verb *must* can never embed predicates with future reference. This peculiar behaviour could be due to its development. As Curme (1931: 410) has illustrated, it is a former subjunctive of the past form that has developed present indicative meaning.

Summing up, in this section the hypothesis has been formulated that circumstantial modal verbs are event modifiers. If this assumption is correct, it is predicted that stative predicates referring to states that cannot be changed or events in the past should be incompatible with modal verbs that lack an epistemic interpretation.

3.3 The case of *can*

As far as possibility modal verbs are concerned, it is a non-trivial matter to keep the circumstantial (practical) possibility interpretation and the epistemic possibility interpretation apart. Some authors even claim that these interpretations cannot be distinguished. Other authors, such as Fritz (1997: 96), assume that there is a strong link between the two readings. In his famous Hypothesis 20, he postulates that any modal verb that exhibits a circumstantial (practical) possibility interpretation can always be used as an epistemic modal verb:²²

Wenn ein Modalverb dazu verwendet werden kann, in allgemeiner Form Möglichkeit auszudrücken, dann kann es grundsätzlich auch dazu verwendet werden, eine schwache Vermutung auszudrücken.

However, Fritz is wrong. There are a couple of modal verbs in English that do not exhibit epistemic readings. Among them the possibility verb *can*. As has already been observed by Hofmann (1976: 94), Coates (1983: 85) Sweetser (1990: 62), Bren-

²² Whenever a modal verb can be used to express a general possibility it can also be used to express a weak assumption.

nan (1993: 14), Drubig (2001: 43), Auwera, Ammann and Klindt (2005: 258) and Hacquard and Wellwood (2012: 4), the English modal verb *can* only allows a circumstantial interpretation, at least whenever it occurs without negation or in non-negative polarity environments.

Given that *can* only allows for a circumstantial interpretation, it becomes precious for the evaluation of the hypothesis formulated above: If circumstantial modal verbs are indeed event modifiers, *can* should not be acceptable in contexts in which it embeds a predication consisting of an identified subject referent and a predicate that either refers to a state that cannot be changed or to an event in the past.

The constructed examples below have been presented to native speakers of English. The instances that include *can* were all rejected as unacceptable. By contrast, the patterns with *could* were considered as fully grammatical.

- (534) a. * Smerdyakov can be the murderer. (circumstantial)
 b. Smerdyakov could be the murderer. (epistemic)
- (535) a. * Smerdyakov can have killed Fyodor Pavlovich. (circumstantial)
 b. Smerdyakov could have killed Fyodor Pavlovich. (epistemic)

This behaviour corresponds exactly to the predictions of the hypothesis presented here. The assumption that circumstantial modals are event modifiers gains additional support.

Note that *can* displays quantificational interpretations in similar environments whenever the subject NP is generically interpreted, as in indefinite NPs. This has been pointed out in great detail by Brennan (1993: 97), based on the observations made by Carlson (1977: 119). In cases like example (536), the possibility modal verb serves as an existential quantifier over individuals: Among the set of basketball players there exists at least one who is short.

- (536) A basketball player can be short. (circumstantial)

Furthermore, no use of *can* is subject to the CoDeC. There is no restriction for *can* to the effect that the embedded proposition is not part of the speaker's knowledge. Any speaker who uses *can* can theoretically be in a position to know that the embedded proposition is true.

The behaviour of the English modal *can* supports the hypothesis that circumstantial modal verbs are event modifiers. As has been shown, *can* is restricted to a circumstantial interpretation. According to the hypothesis advocated here, it is expected that *can* as a verb that is limited to a circumstantial interpretation should not embed predications consisting of an identified subject referent and a predicate that refers to a state that cannot be changed, or to an event in the past. These predictions could be verified.

In the next sections, it will be shown that the hypothesis advocated here can be extended to other ambiguous items that carry an epistemic interpretation as well as some other root interpretation. First of all, there are categories in German apart from (modal) verbs that exhibit such ambiguities. All of these categories behave exactly as the hypothesis predicts. Moreover, there are various other languages that exhibit similar ambiguities of modal operators as well. Likewise, their behaviour provides additional support to the hypothesis stated above.

3.4 Ambiguities across categories

Epistemic modification is a phenomenon that occurs frequently in fairly different configurations. Roughly speaking, it comprises all sorts of modifiers that are evaluated with respect to the speaker's knowledge. A speaker typically employs such modifiers to indicate that the embedded proposition is not part of his knowledge. Epistemic modifiers can be realised by very different types of syntactic categories such as verbs, adverbs, particles or even adverbial clauses. Any word or complex phrase that exhibits an epistemic interpretation usually involves a further interpretation. This second non-epistemic interpretation is characterised by a higher amount of lexical content, as opposed to epistemic modifiers, which are semantically bleached.

Based on observations made by Sweetser (1990), Sweetser and Dancygier (2005), Wegener (1993), Kratzer (1995: 130), Haegeman (2002: 117, 2004), Zimmermann (2004: 256) and Maienborn (2004: 162), the upcoming section renders an overview of different types of epistemic modifiers and the properties they have in common. In addition, a couple of related modifiers will be considered which differ from epistemic modifiers in minor respects, but which share a lot of crucial properties with them.

3.4.1 Conditionals

According to Kratzer (1978: 241, 1986: 8, 2012: 97) and Lassiter (2011: 98–100) conditional clauses are associated with covert modal operators. If this is correct, the approach outlined in the preceding section makes two predictions. Firstly, conditionals should allow for an epistemic interpretation and, secondly, only an epistemic interpretation should be possible with predications consisting of an identified subject referent and a predicate that refers to a state which cannot be changed, or a predicate that refers to a past event. As will be shown, both predictions are correct.

Based on data from English, Kratzer (1986: 8, 1995: 130, 2012: 97), Sweetser (1990: 116), and Haegeman (2002: 125) have pointed out that modal operators in conditionals can indeed be alternatively interpreted in an epistemic way. Moreover, Kratzer (1995: 130) observes that there is a subtle distributional difference between generic *when*-clauses and *if*-clauses: Generic *when*-clauses are only acceptable in contexts with predicates that contribute an event argument (cf. 537). By contrast, *if*-clauses are also compatible with predicates that refer to a state which cannot be changed (cf. 538).

- (537) a. When Mary speaks French, she speaks it well. (event related)
 b. * When Mary knows French, she knows it well. (event related)
- (538) a. If Mary speaks French, she speaks it well. (event related/epistemic)
 b. If Mary knows French, she knows it well. (event related/epistemic)

Thus, it appears reasonable to conclude that generic *when*-clauses are modifiers that are restricted to event related modification, analogously to the English modal auxiliary verb *can*. Event related modifiers are not compatible with predicates that refer to a state that cannot be changed, and an epistemic interpretation is excluded. However, *if*-clauses turn out to be ambiguous between an event related interpretation and an epistemic one. As Kratzer (1995: 130) has illustrated, an epistemic interpretation becomes available as soon as the *if*-clause involves a stative predicate that cannot be changed. This is exactly the way in which the modal verbs discussed in the previous sections behave. According to Kratzer (1995: 131), this behaviour is due to the *Prohibition Against Vacuous Quantification*, which states that each quantifier has to bind some sort of variable. This might not be the appropriate explanation here, however, since the modal operator does not always quantify over the event variable provided by the embedded predicate.

In a similar vein, generic *when*-clauses and event related conditionals fail to modify clauses describing an event that temporally precedes the event of the *when*-clause. Sweetser (1990: 123) has pointed out that epistemic conditionals are felicitous in such contexts (cf. 539b). The equivalent of example (539a) headed by the subordinator *if* becomes possible.

- (539) a. * When they have to leave a message, he has gone already. (content)
 b. If they have to leave a message, he has gone already. (epistemic)

Once again, it turns out that generic *when*-clauses and event related conditionals behave exactly like circumstantial modal verbs, and that epistemic *if*-clauses share a lot of properties with epistemic modal verbs. As expected by the analysis outlined in the preceding section, propositions which contain predicates referring

to states that cannot be changed or events that precede the conditional/*wenn*-clause event force an epistemic interpretation. In a similar manner, Haegeman (2002: 131) observes that there are two types of conditional clauses, event related conditionals, which are attached to the *vP*, and premise conditionals, which are attached to the *CP*. The latter type roughly corresponds to the epistemic conditionals discussed here.

In German, conditional clauses are most typically headed by the subordinator *wenn*. Just as their English counterparts, they can be interpreted in an event related or in an epistemic or speech act related manner. Whenever they modify a matrix clause containing a predicate that refers to a state that cannot be changed, such as *kennen* ‘know’, the event related interpretation is ruled out, as illustrated in examples (540)–(541). Likewise, the event related interpretation is not available if the modified matrix clause contains a predicate referring to an event that has occurred prior to the event contributed by the conditional clause, as is shown in examples (542) and (543). Furthermore, non-event related conditionals can embed entire speech acts, such as questions (cf. 544). This raises the question to what extent epistemic modifiers are speech act modifiers.

- (540) Wenn Ortsbürgermeister Maik Köhler im Wahlkampf
 if Mayor Maik Köhler in.the election.campaign
 betonte, der Schulstandort Niederschelderhütte stehe nicht
 stressed the school.facility Niederschelderhütte stands NEG
 zur Disposition, dann kennt er die Marschrichtung seiner
 to.the disposition then knows he the route.of.march his-GEN
 Partei nicht.²³
 party NEG

‘If Mayor Maik Köhler claimed in the election campaign that the school facility Niederschelderhütte was not at issue, then he does not know the opinion of his own party.’

- (541) Wenn Bush behauptet, dass die Welt seit dem Einmarsch
 if Bush claims that the world after the invasion
 der Koalitionstruppen sicherer geworden sei, dann
 the-GEN coalition.troops safer became be-SBJV.PRS then
 lügt er.²⁴
 lies he

‘If Bush claims that the world became a safer place after the invasion of the allies, then he is lying.’

²³ DeReKo: RHZ05/APR.35161 Rhein-Zeitung, 29/04/2005.

²⁴ DeReKo: NUN06/OKT.02212 Nürnberger Nachrichten, 21/10/2006.

- (542) Wenn das aber tatsächlich so ist, dann hat der so heftig
 if this yet indeed so is then has the so fiercely
 attackierte Sozialstaat nicht weniger, sondern mehr Geld
 attacked welfare.state NEG less but more money
 ausgegeben²⁵
 spend
 'If this is indeed the case, then the fiercely attacked welfare state has spent more
 money rather than less.'
- (543) Wenn er glaubt, er könne sich verstecken und vor den
 if he beliefs he can-SBJV.PRS REFL hide and from the
 USA und ihren Verbündeten fliehen, dann hat er sich schwer
 USA and their allies escape than has he REFL heavily
 getäuscht.²⁶
 erred
 'If he believes he can hide and escape from the USA and its allies then he is mistaken.'
- (544) Wenn das stimmt, warum sollen wir uns dann überhaupt mit den
 if this holds why shall we us then at.all with the
 utopischen Steuerträumereien von Schwarz-Gelb beschäftigen?²⁷
 utopian tax.dreams of Black-Yellow occupy
 'If this is true, why should we then be concerned with the utopian dreams of the black
 yellow coalition about taxes?'

Epistemic conditional clauses are characterised by another crucial property: They can involve echoic antecedents. In the canonical conditional clauses, the truth value of the proposition expressed by the antecedent is not known. As has been observed by Fabricius-Hansen and Sæbø (1983: 2), there are certain instances of *wenn*-clauses in which the proposition expressed by the antecedent is known to be true. Often, examples such as (540) or (541) are referred to as 'echoic'. In a similar vein, Haegeman (2002: 120) has demonstrated that echoic conditional clauses never exhibit an event related interpretation. Rather, they modify the entire speech act. Their ability to be echoic has interesting implications.

As pointed out above, epistemic modal verbs and conditional clauses are characterised by the ability to modify predications consisting of an identified subject referent and a predicate that denotes a state which cannot be changed, or a predicate that refers to an event in the past. In the case of conditional clauses, this property does not only affect the structure that is modified (matrix clause) but

²⁵ DeReKo: NUN07/AUG.02550 Nürnberger Nachrichten, 22/08/2007.

²⁶ DeReKo: NUZ04/DEZ.02035 Nürnberger Zeitung, 16/12/1004.

²⁷ DeReKo: M09/NOV.93935 Mannheimer Morgen, 26/11/2009.

also the conditional clause itself. If it is an epistemic conditional clause, it can in principle be realised as an echoic clause.²⁸ And echoic clauses can in turn embed predications consisting of an identified subject referent and a predicate denoting a state that cannot be changed, or a predicate that refers to an event in the past. This is not possible with event related conditionals.

Furthermore, epistemic conditionals have the same functions as epistemic modal verbs. In all of the examples containing epistemic conditionals that were given above, (538b), (539b) and (540)–(543), the speaker signals that he has no direct evidence for the embedded proposition (relativisation), and he indicates that the embedded proposition is consistent with his knowledge (commitment to the truth).

Apart from that, epistemic conditionals display further properties that are reminiscent of the behaviour of epistemic modal verbs. As Haegeman (2002: 133) has demonstrated, a VP anaphora can only be licensed by event conditionals, but never by echoic conditionals. A similar restriction applies to epistemic modal verbs, as will be illustrated in Section 4.7. Moreover, Haegeman (2002: 129) has shown that event related conditionals can be separated from the matrix clause in cleft sentences. By contrast, echoic event conditionals fail to be clefted under similar circumstances. This is reminiscent of epistemic modal verbs, which cannot be separated from the proposition they modify in *w*-clefts, as will be demonstrated in Section 4.8.

The most important finding in this section is that epistemic conditional clauses exhibit striking parallels with epistemic modal verbs. Just like epistemic modal verbs, epistemic conditional clauses are less restrictive with respect to the structures they modify. More specifically, they can modify predications consisting of an identified subject referent and a predicate denoting a state that cannot be changed, or a predicate that refers to an event in the past. Just as with circumstantial modal verbs, event related conditionals are hardly acceptable in all of these environments. This is due to their nature of being an event modifier.

28 As Fabricius-Hansen and Sæbø (1983: 2) illustrates, conditional clauses in German can be headed by a couple of conjunctions: *wenn*, *falls* and *sofern*. She argues that *wenn* can only head an echoic conditional whereas *falls* and *sofern* cannot. As all of these conjunctions can occur with an epistemic interpretation. This indicates that there is no one to one correspondence between the availability of an epistemic interpretation and the ability to occur in echoic contexts. Yet, the ability to express epistemic meaning appears to be a prerequisite for being an echoic conditional clause.

3.4.2 Causal clauses

As has been demonstrated by Sweetser (1990: 77) and Haegeman (2002: 142) for English and Eroms (1980: 94), Wegener (1993), Uhmman (1998), Antomo and Steinbach (2010) and Reis (2013) for German, causal conjunctions such as English *because* and German *weil* can come with different interpretations: event related and epistemic ones. According to the analysis developed in the previous sections, it is expected that these adverbial clauses only exhibit an epistemic interpretation as soon as they modify a clause containing an event that precedes the event encoded by the predicate in the adverbial clause.

As the examples provided by Wegener (1993: 296) illustrate, matrix clauses that contain an event in the past only appear to be acceptable with epistemically interpreted *weil*-clauses.

- (545) a. Es hat gehagelt, WEIL – mein Auto hat Dellen.
 it has hailed because my car has dents
 ‘It hailed, because the car has dents.’
- b. # Es hat gehagelt, weil mein Auto Dellen hat.
 it has hailed because my car dents has
 ‘It hailed because the car has dents.’
- c. Es hat gehagelt. Das behaupte ich, weil mein Auto Dellen
 it has hailed this claim I because my car dents
 hat.
 has
 ‘It hailed. I claim this because the car has dents.’

As is predicted by the account proposed here, event related *weil*-clauses cannot modify propositions which contain events that temporally precede the event expressed by the *weil*-clause (545b): the fact that the car has dents at the Time of Utterance cannot be the cause for the past hailing event. As soon as the *weil*-clause targets the proposition rather than the event argument provided by the matrix predicate, an interpretation becomes possible. In contrast to event related causal clauses, the *weil*-clause in example (545a) expresses a premise which causes the speaker to assume the proposition expressed by the matrix clause to be true: knowing that the car has dents, the speaker concludes that it must have hailed. Once more, a modifier that takes scope over a past related proposition is restricted to an epistemic interpretation.

As adverbial clauses contain a further event description, the situation is more complex than with modal verbs that embed predications. Under certain circumstances, matrix clauses with past reference can be modified by event related causal clauses. This is possible in contexts in which the *weil*-clause contributes

an event that temporally precedes the event expressed by the matrix predicate. If the matrix predicate refers to an event in the past, an event related *weil*-clause needs to carry an event that occurred even earlier in the past.

At any rate, non-epistemic *weil*-clauses are more sensitive with respect to the phrase they modify. They impose selectional restrictions, as they can only modify events that happen posterior to the event that is expressed by the predicate in the *weil*-clause. By contrast, epistemically interpreted *weil*-clauses are not subject to any restriction in this respect.

Accordingly, matrix clauses containing a predicate that refers to a state that cannot be changed are not compatible with event related *weil*-clauses unless *weil* contributes an event that is located prior to the event provided by the matrix clause. In any other case, an event related interpretation is excluded, as is illustrated in (546).

- (546) Wer als Finanzberater so tut, als kenne er die
 who as financial.consultant so does as knows-SBJV.PRS he the
 Wahrheit, lügt. Weil: Würde er die Wahrheit kennen,
 truth lies because would he the truth know
 wäre er kein Finanzberater mehr, sondern – dank
 be-SBJV.PRS he no financial.consultant more but thank
 der Wahrheit – unermesslich reich.²⁹
 the truth immeasurably rich

'Any financial consultant that pretends to know the truth is lying. Because: If he knew the truth, he would not be a financial consultant anymore but rather immeasurably rich thanks to the truth.'

A direct comparison between event related and epistemic *weil*-clauses is more complex than that, as the different interpretations tend to come with different word order patterns. As Wegener (1993: 295) has pointed out, event related causal clauses prefer *weil*-clauses with the finite verb in the final position, which is the canonical configuration for embedded clauses in German. However, epistemic *weil*-clauses predominantly occur in configurations with the verb in the second position, which is reminiscent of the word order of main clauses. As the V2 word order with adverbial clauses is considered as language decline among normative grammarians, these patterns are suppressed in written language. Therefore, they are hardly attested in corpora that are based on newspapers. Interestingly, these patterns appear to be widely tolerated as soon as *weil* is followed by a colon, as is exemplified in example (546). In any case, Uhmann (1998: 127) illustrates that the correlation of functional difference and word order is not entirely categorical,

²⁹ DeReKo: RHZ08/OKT.16400 Rhein-Zeitung, 24/10/2008

as there are also epistemic *weil*-clauses that exhibit verb final order. Such patterns typically occur in fronted position and precede the entire utterance. Likewise, Scheutz (1999: 97), Antomo and Steinbach (2010: 17–18) and Reis (2013: 243–246) illustrate that *weil*-clauses with verb final word order can occasionally exhibit an epistemic interpretation even if they follow the modified clause. Yet, in this configuration, it is necessary for the preceding clause, which is the target of the modification, to be set off by a low final boundary tone L%. In this case, the *weil*-clause with verb final order is disintegrated in prosodic terms.

Wegener (1993: 293) shows that epistemic instances of *weil* can alternatively modify entire speech acts such as questions. As Sweetser (1990: 77) demonstrates, its English counterpart *because* is attested in configurations in which it modifies interrogative and directive speech acts.

Before concluding this section, a short remark on the diachronic development of epistemic *weil* will be made. As Speyer (2011: 80) has pointed out, *weil* only became a causal conjunction in the course of the 16th century and was exclusively restricted to event related causal clauses.

As a small corpus study based on Homer's *Odyssee* and *Illias* translated by Johann Heinrich Voß could reveal, *weil*-clauses that modify speech acts are attested from the 18th century onwards. It deserves closer attention that all of the instances which can be found, given below, exhibit verb final word order. Examples (548)–(550) exhibit a configuration in which the *weil*-clause appears fronted preceding the entire matrix clause, just as the cases described by Uhmman (1998: 127). In contrast, example (547) contains a *weil*-clause that is realised subsequent to the modified matrix clause. What is modified here is an assertion. Yet, the causal clause does not have any epistemic resonance, as the modified proposition is explicit knowledge of the speaker. An analogous pattern can be found in Schiller's *Wallensteins Tod* (cf. 551).

(547) Aber der Unglücklichste aller sterblichen Menschen // Ist wie
 but the unfortunate-SUP all-GEN mortal-GEN human-GEN is as
 man sagt, mein Vater, weil du mich fragtest.³⁰
 one says my father because you me asked
 'But the most unfortunate of all human beings is – as I have been told – my father, as
 you have asked me.'

(548) Aber weil Du begehrt, daß ich bleib' und jenen erwarte; // Nun
 but because you desire that I stay and him await now
 so erzähle mir von der Mutter des edlen Odysseus, [...] ³¹
 so tell me of the Mother the-GEN noble-GEN Odysseus-GEN

³⁰ *Odyssee*, I, 220 translated by Johann Heinrich Voß (1781).

‘But as you desire that I stay and await him, tell me about the Mother of the noble Odysseus.’

- (549) Fremdling, weil du mich fragst und so genau dich erkundest,
 stranger because you me asked and so exactly REFL inquire
 // Nun so sitze still, erfreue dich horchend, und trinke Wein.³²
 now so sit quietly rejoice REFL listening and drink wine
 ‘Stranger, as you ask me and inquire in great detail, so sit quietly, rejoice in listening and drink wine.’
- (550) Fremdling, weil du denn doch in die Stadt zu gehen verlangest
 stranger because you PART PART in the city to go desire
 [...] // Auf denn so wollen wir gehen!³³
 up PART so want we go
 ‘Stranger, as you desire to go to the city, get up and let us go!’
- (551) HERZOGIN: Komm, Schwester, weil er es befiehlt.³⁴
 duchess come-IMP sister because he it orders
 ‘DUCHESS: Come, as he orders us to do so.’

Related epistemic causal clauses are already attested in the 16th century, as the *dieweil*-clause in example (552) illustrates:

- (552) darab der Oberst sehr froh ward / denn er gedachte bey
 about.that the colonel very happy got for he thought by
 jhm selbst / dieweil er zu Leuten kommen were / die
 him self because he to people come be-SBJV.PST the
 etlicher massen Schifffung hetten / so ko^endte Indien nicht
 many size navigation had thus can-SBJV.PST India NEG
 mehr weit seyn³⁵
 more far be-INF
 ‘Therefore the colonel became very happy, for he thought that since he came to people with the knowledge of navigation India could not be that far any more.’

This raises, again, the question to what extent epistemic and speech act modifying instances of *weil*-clauses represent the same phenomenon. As shown in Maché (2012: 115), there is good evidence in favour of a unified analysis. Even if it turns

³¹ *Odyssee*, XV, 345 translated by Johann Heinrich Voß (1781).

³² *Odyssee*, XV, 389 translated by Johann Heinrich Voß (1781).

³³ *Odyssee*, XVII, 185 translated by Johann Heinrich Voß (1781).

³⁴ Friedrich von Schiller, *Wallensteins Tod*, III.6 (1799).

³⁵ Ulrich Schmid, *Neuwe Welt*, p. 7a, (1567).

out that these uses of *weil*-clauses should be kept apart, it cannot be denied that there is a close kinship between these phenomena.

Summing up, the analysis developed here predicts that an epistemic *weil*-clause should be less restrictive with respect to the phrase it modifies. In contrast, event related causal clauses impose a restriction on the clause they modify: They need to contain either an event argument, or a state that came about posterior to the event expressed by the predicate in the *weil*-clause. In that respect, *weil*-clauses display a behaviour that is almost completely analogous to the one exhibited by the so-called modal verbs described above.

Likewise, epistemically interpreted causal clauses are characterised by the same sort of functions as epistemic modal verbs. Using an epistemic causal clause, the speaker indicates that he does not have direct evidence for the truth of the embedded proposition, and he signals that this proposition is in principle consistent with his knowledge.

3.4.3 Causal *wo*-clauses

For the sake of completeness, another conjunction will be mentioned here that can be interpreted in a similar manner as epistemic *weil*. Originally, *wo* is used as a *w*-pronoun that refers to locations. In addition, it can be employed as a relative adverb that introduces a relative clause specifying a locations, as Günthner (2002: 310) illustrates.

Yet, *wo* also occurs in contexts in which it contributes causal meaning. Just as the fronted epistemic *weil*-clauses with verb final order that have been described by Uhmman (1998: 127), *wo*-clauses can render the reason for a speech act. An analogous example has been provided by Günthner (2002: 322).

- (553) Felix, wo Du gerade da bist, kannst Du mir sagen, wo
 Felix where you just here are can you me say-INF where
 der Schüssel zum Druckerraum ist?³⁶
 the key to.the printer.room is

'Felix, as you are here right now, could you tell me where the key to the printer room is?'

Zifonun (1997: 2299) has already demonstrated that adverbial *wo*-clauses can have a causal interpretation that provides the reason why the speaker utters the modified speech act. Her examples follow the matrix clause and contain the reinforcing

³⁶ Utterance that was produced in my office 14/12/1010.

particle *doch*. Likewise, Günthner (2002: 325) points out that causal *wo*-clauses act as modifiers of the speech act.

Even if they do not behave differently from epistemic modal verbs, causal *wo*-clauses represent a related phenomenon. In the canonical use *wo* is restricted to the modification of an entity in the external world, whereas in the causal use it modifies the speech act itself.

3.4.4 Corrective uses of *obwohl*, *wobei* and *wiewohl*

As Günthner (1996: 339, 1999: 414, 2000: 444) has pointed out, the concessive conjunction *obwohl* can be used in a way that is reminiscent of epistemic *weil*. Firstly, *obwohl* occasionally heads a clause that modifies the validity of the proposition. And secondly, whenever it comes with such an interpretation, it introduces a clause that exhibits verb second word order, just like epistemic *weil*.

In its canonical use with verb final order, *obwohl*-clauses “indicate that the situation in the matrix clause is contrary to expectation in the light of what is said in the concessive clause”, as has been argued by Quirk et al. (1985: 1098) and Günthner (2000a: 442). In other words, the state of affairs expressed in the *obwohl*-clause makes it unlikely that the state of affairs expressed by the matrix clause obtains. Briefly, the proposition denoted by the concessive clause does not have the expected consequences. Alternatively, concessive clauses could be considered as a particular type of conditionals which involve a negated consequent: ‘*obwohl*(*p*), *q*’ could be rephrased as ‘usually ($p \supset \neg q$)’, as is assumed by Eisenberg (2004: 337). Being closely related to conditional clauses, it is expected that concessive clauses exhibit an ambiguity that behaves in a similar way to that of conditionals. In some respects, concessive *obwohl*-clauses are similar to circumstantial modal operators in that they impose clear selectional restrictions on the linguistic structure they modify: The event or state of affairs denoted by the matrix clause is canonically not prior to an independent event or state of affairs denoted by the *obwohl*-clause.

In contrast to the concessive uses of *obwohl*, configurations like the one discussed above can be embedded by the non-canonical use of that subordinator without any *ado*, as illustrated below. Non-canonical *obwohl* clauses are characterised by a word order in which the verb surfaces as the second constituent, reminiscent of the main clause word order in German. As far as its interpretation is concerned, non-canonical *obwohl* modifies the validity of the proposition or even speech act that is expressed by the matrix clause. As Günthner (2000a: 448) argues, non-canonical *obwohl* operates on the epistemic domain, as it is used to refute an assumption and replace it by an updated assumption. These uses of *ob-*

wohl-clauses are called ‘corrective’ uses in the terminology suggested by Günthner (1996: 339, 1999: 414, 2000: 444). As Günthner (2000b: 320) has pointed out, an analogous contrast can be found with another concessive conjunction: *wobei* ‘albeit’. Apart from her observations, the archaic concessive conjunction *wiewohl*, which is predominantly used in written language, is occasionally used as a corrective conjunction that head verb second clauses.

In opposition to concessive instances of *obwohl*-clauses, their corrective counterparts can modify matrix clauses expressing a state of affairs that precedes the one denoted by the adverbial clause, as is demonstrated in examples (554)–(555). A similar behaviour can be found with the corrective uses of *wobei* (cf. 556) and *wiewohl* (cf. 557). In all of the cases given below, a concessive interpretation is ruled out, even if the word order of the adverbial clauses is transformed into verb final word order.

- (554) Aber das hat sich nun erledigt. Obwohl: Es stellt sich
 but this has REFL now complete-PPP although it poses REFL
 natürlich die dringende Frage, was denn mit dem Stuhl
 naturally the urgent question what PART with the chair
 passiert ist.³⁷
 happened is
 ‘But this matter is settled now. Though, there is still the urgent question of what happened to the chair?’
- (555) Früher stand das Kämpferische stärker im Zentrum. –
 earlier stand-PST the militant strong-COMP in.the center
 Obwohl: Wir beziehen auch heute noch immer klar Stellung.³⁸
 although we take also today still always clearly position
 ‘In former times, the militant aspect was more important. Still, we also take a firm stand in these days.’
- (556) Den Arien und Ensembles hat er zusammen mit Kapellmeister
 the arias and ensembles has he together with bandmaster
 Dietger Holm Disches und Jelineks Worte in den Mund
 Dietger Holm Disch-GEN and Jelinek-GEN words in the mouth
 gelegt, wobei: Der Großteil des rund
 put-PPP albeit the majority the-GEN about
 eineinhalbstündigen Abends besteht ohnehin aus
 one.and.a.half.hour-ADJ.GEN evening-GEN consists anyway of
 Reden und Spielen.³⁹
 talking and playing

37 DeReKo: BRZ08/DEZ.11041 Braunschweiger Zeitung, 20/12/1008.

38 DeReKo: A09/AUG.06327 St. Galler Tagblatt, 25/08/2009.

‘Together with the bandmaster Dietger Holm, he integrated the words of Disch and Jelinek into the arias and ensembles, albeit the majority of the evening, which lasted one and a half hours, consisted of talking and playing anyway.’

- (557) „Volksverhetzung wurde 2005 (nur) 29 Mal zur Anzeige gebracht.“ Wiewohl: „Es gibt eine Dunkelziffer bei (rechtsextremer) Gewalt. Sie ist hoch, weil man Delikte meist untereinander regelt und nicht zur Anzeige bringt.“⁴⁰
 brings

‘In 2005, incitement of the people was (only) reported to the Police in 29 cases. Still, there is a dark figure for violence with right extreme motivation. The number is high as issues are solved among the people rather than reporting them to the Police.’

Just as in the case of *weil*-clauses, the relation between different forms and functions is not entirely strict. As Günthner (1999: 427, 2000: 321) indicates, corrective *obwohl* and *wobei* clauses can exhibit a verb final order in some cases.

Even if the semantics of concessive clauses are fairly different from those of the modifiers considered so far, they have an important property in common. They have an ambiguous counterpart, so-called ‘corrective clauses’, which operates on the propositional level. In this use, they exhibit looser selectional restrictions than their event related cognates.

3.4.5 Contrastive *während*-clauses

As has been pointed out by Haegeman (2002: 137), there are temporal conjunctions that are ambiguous between an event related and a propositional interpretation. The conjunction *while* refers to the simultaneity of two events in its event related interpretation, while it expresses a simultaneity of the processing of two propositions in its propositional interpretation.

As Wegener (1993: 297), among others, illustrates, the temporal conjunction *während* ‘while’ can be used in an analogous manner. Like its English correlate *while*, it is ambiguous between an event related interpretation, in which it expresses the simultaneity of two events, and an interpretation in which it refers

³⁹ DeReKo: M12/MAR.03760 Mannheimer Morgen, 12/03/2012.

⁴⁰ DeReKo: BRZ06/NOV.04130 Braunschweiger Zeitung, 08/11/2006.

to the simultaneity of the processing of two propositions. According to Haegeman (2002: 137), the propositional interpretation can be considered as instantiating the contrastive use. Interestingly, the propositional interpretation of *während* differs from its temporal correlate in terms of word order: just as epistemic *weil*-clauses and corrective *obwohl* and *wobei*-clauses, contrastive *während*-clauses are characterised by verb second word order. Apparently, such patterns are only used by speakers of Southern German varieties.

Freywald (2010: 61) has provided example (558) from a corpus of spoken language:

- (558) Für Theater interessier ich mich schon, also da geh ich
 for theatre interest I REFL PART thus there go I
 öfters mal hin und auch ins Kino, während
 regularly once there and also in.the cinema while
 Kunstausstellungen hab ich mir eigentlich selten angeguckt.⁴¹
 art.exhibitions have I REFL actually rarely watched
 ‘In theatre, I am interested, well, I regularly go there and to the cinema as well, while I have hardly ever visited any art exhibitions.’

As this example illustrates, contrastive *während* can relate two clauses describing two events which do not temporally overlap in the required manner. In canonical temporal *während*-clauses, the Topic Time of the event in the *während*-clause entirely includes the Topic Time of the event provided by the matrix clause. This condition is not met in the instance of *während* given above. Nevertheless, a contrastive interpretation is provided, whereas the temporal one is ruled out. This indicates that the temporal *während*-clause imposes clear selectional restrictions on the type of event provided by the matrix predicate. In contrast, such restrictions are absent from the contrastive interpretation, which can relate propositions that describe any type of events or states.

3.4.6 *so lange*-clauses

There are further temporal conjunctions that are ambiguous between an event related and a clause related interpretation. Under particular circumstances, *so lange* ‘as long as’ can bear an interpretation that is not event related. Being restricted to a fronted position, this type is reminiscent of fronted *wo* Günthner (2002: 322) and *weil* Uhmann (1998: 127).

⁴¹ AGD, Rhine-Franconian background, 1961; Korpora des Archivs für Gesprochenes Deutsch, Archivs für Gesprochenes Deutsch (AGD) am Institut für Deutsche Sprache, Mannheim, <http://agd.ids-mannheim.de/>.

Example (559) was found in my own email correspondence with Roland Hinterhölzl, in which I asked him whether he could provide me with a particular linguistic paper:

- (559) So lange Du noch in Berlin bist: kannst du vielleicht noch schnell
 as long you still in Berlin are can you maybe still quickly
 den besagten Haegeman Artikel raussuchen und irgenwo
 the aforesaid Haegeman article search and somewhere
 deponieren, sodass ich an ihn rankomme?
 deposit so.that I to it there.come

‘As long as you are still in Berlin, could you look for the aforesaid Haegeman article and leave it somewhere where I can access it?’

What is modified in example (559) is not the event provided by the matrix predicate, but the validity of the illocutionary force. In this particular case, the *so lange*-clause modifies a question. Accordingly, an event related interpretation is not possible here. This once again demonstrates that the non-event related interpretation of modifiers is typically characterised by the lack of selectional restrictions for the event type contributed by the matrix clause.

3.4.7 *bevor*-clauses

In a similar fashion, temporal clauses that are headed by the conjunction *bevor* ‘before’ can be interpreted in an event-related as well as a clause-related way. They are restricted to the fronted position, just as *wo*- and *solange*-clauses are.

In the event related interpretation, the *solange*-clause modifies a matrix event that temporally proceeds the event described in the adverbial clause. In opposition to that, it modifies the validity of the matrix speech act. The person who utters example (560) wants the modified proposition to be accepted by the addressees before they start to write angry letters to the editor. What he furthermore intends is that addressees could change their minds if they acknowledged the modified utterance that women are a minority in the executive suits. The example provided in (561) behaves in a similar way, though the modified illocution is a directive speech act:

- (560) Und bevor jetzt wieder böse Leserbriefe kommen: Frauen sind
 an before now again bad letters come women are
 von der Anzahl her im Norden natürlich keine Minderheit,
 of the number from in.the North naturally no minority,
 jedoch in den Chefetagen.⁴²
 yet in the executive.suits

‘Before we will receive letters of angry readers (let me concede): As far as their number is concerned, women are not a majority in the North, yet, they are in the executive suits.’

- (561) Bevor Sie jetzt Ihren Bettvorleger zerschneiden, denken Sie
before you now your bedside.carpet cut think-IMP you
bitte mal eine Minute nach.⁴³
please once a minute after

‘Before you start to cut your bedside carpet, meditate a minute!’

Once again, what is modified here is not the event, but the validity of the assertion or illocutionary force. Furthermore, the selectional restrictions on the event provided by the matrix clause are suspended.

3.4.8 Final *damit*-clauses

Apart from *weil*-clauses, *wo*-clauses, *solange*-clauses and *bevor*-clauses, there are further adverbial clauses that occur in the fronted position obtaining a non-event related interpretation, such as clauses headed by the conjunction *damit*.

In their canonical use, *damit*-clauses are associated with a final meaning, as is shown in Eisenberg (2004: 338) and Eisenberg et al. (2005: 639). Accordingly, they express the purpose of the action denoted by the matrix clause. In other words, final *damit*-clauses modify an event that is either explicitly expressed by the matrix predicate, or an event that has caused the state of affairs expressed by the matrix clause. Typically, this matrix event temporally proceeds the event encoded by the *damit*-clause. Hence, the use of a *damit*-clause implies that there is an agent who is in control of the situation expressed by the matrix clause. This exertion of control can be considered as an event. Correspondingly, final *damit*-clauses can be regarded as event modifiers restricted to events that are intentionally performed by an animate referent.

In contrast to these uses, there are cases in which the *damit*-clause modifies the speech act. In these instances, the *damit*-clauses reveal the purpose of the speaker’s uttering the matrix clause. Once again, the selectional restrictions imposed on the event are dropped in examples (562)–(564). None of the matrix clauses which are part of the utterances below is associated with an event that is intentionally performed. Accordingly, these clauses cannot be modified by canonical *damit*-clauses. Rather, the only action which is intentionally performed is

⁴² DeReKo: HMP12/MAR.00699 Hamburger Morgenpost, 08.03.2012.

⁴³ DeReKo: NUZ10/FEB.01329 Nürnberger Zeitung, 13.02.2010.

the act of uttering the matrix clause, and as a consequence it is this action that is modified by the *damit*-clause.

- (562) *Damit Du gar nicht erst fragen musst: Von den beiden, in.order.that you INTN NEG first ask-INF must of the two die wir kennen, ist keiner darunter.*⁴⁴
that we know is none among
'To prevent you from even asking: Of the two we know neither is among.'
- (563) *Damit Sie wissen, mit wem Sie es zu tun haben: Ich bin in.order.that you know with whom you it to do have I am 42 Jahre alt, ledig, von Beruf Bankangestellter und in 42 years old unmarried of profession bank.clerk and in meiner Freizeit im kirchlichen Bereich in meiner Pfarrei für my free.time in.the church domain in my parish for die Missionsarbeit und Entwicklungshilfe in den Ländern the proselytisation and development.assistance in the countries wie Südamerika, Afrika, Asien usw. zuständig.*⁴⁵
like South.America, Africa, Asia a.s.f. responsible
'Just so you know with whom you are dealing: I am 42 years old, unmarried, a bank clerk and in my free time, I am volunteering in the church in my parish, where I am responsible for the proselytisation and development assistance in countries such as Southern America, Africa, Asia, and so forth.'
- (564) *Damit Sie mich nicht falsch verstehen: Es hat mich nicht in.order.that you me NEG wrong understand it has me NEG sexuell erregt!*⁴⁶
sexually excited
'Just so you do not misunderstand did get me wrong: It did not sexually arouse me.'

In all of the examples given above, an event related reading is ruled out. In example (563), for instance, the bank clerk is not intentionally being 42 years old in order to demonstrate to the addressee who he is. The remaining examples function in an analogous manner. A similar example is briefly discussed by Leys (1991: 173), who analyses it as a 'parenthetical' use of *damit*. Furthermore, this pattern is mentioned in Reis and Wöllstein (2010: 135 Fn. 31).

Again, the situation is much reminiscent of modal verbs. *Damit*-clauses are ambiguous between two different patterns. In the first one, they act as event modifiers that impose selectional restrictions on the type of event. Event related

⁴⁴ DeReKo: NUZ03/JUL.00086 Nürnberger Zeitung, 01/07/2003.

⁴⁵ DeReKo: R99/DEZ.98038 Frankfurter Rundschau, 02/12/1999.

⁴⁶ DeReKo: HMP06/NOV.02363 Hamburger Morgenpost, 23/11/2006.

damit-clauses are restricted to the modification of events that are intentionally performed by some agent. In the second one, they are used as speech act related *damit*-clauses, which can be combined with matrix clauses that carry any type of event, or that may even lack a Davidsonian event argument at completely.

3.4.9 Addressee-oriented free relative clauses

Likewise, there are free relative clauses which do not occupy argument positions, or which do not act as VP-adverbials. As Pittner (2003:200) has pointed out, free relative clauses can refer to the addressee and the utterance situation, cf. examples (565)–(566), which she extracted from the corpus *DeReKo I*:

(565) Wem es reicht: Nach Unterquerung der Bahnstrecke
 whom it be.enough after underground.crossing the railway
 kann man nach rechts zum Bahnhof Kahl abbiegen.⁴⁷
 can one to right to.the railway.station Kahl turn
 ‘For whom this is enough: You can turn to the right just after crossing the railway track.’

(566) Wen immer das Angebot interessiert: Einführungsseminare
 whom ever the offer interests beginner’s.courses
 werden am 11./12. angeboten⁴⁸
 PASS.AUX at 11th/12th offer-PPP
 ‘Whoever is interested: beginner’s courses will be offered at the 11th/11th.’

In the terminology used in the present analysis, the situation can be described as follows: The free relative modifies the speech act event; ‘who ever is interested’ restricts the set of potential addresses for the following utterance.

3.4.10 Adverbial infinitives

Apart from finite adverbial clauses, there are other types of modifiers that exhibit an analogous ambiguity, e.g. adverbial infinitives. As has been pointed out by Leys (1991) and Eisenberg (1992: 220, 2004: 376), adverbial infinitives that are headed by *um* can occur with a variety of meanings: intentional/final, teleological, prospective and meta communicative/parenthetical.

⁴⁷ DeReKo I: R99/AUG.68235 Frankfurter Rundschau 26.08.1999, S. 3 = Pittner’s example (9).

⁴⁸ DeReKo I: R97/MÄR.21693 Frankfurter Rundschau, 20.03.1997, S. 99 = Pittner’s example (10).

Most of the final and teleological interpretations involve referential identity between the matrix subject and the subject argument of the infinitive (subject control). Yet, it has been shown by Clément (1986: 263) and Eisenberg (1992: 213) that this does is not necessarily the case, and that the infinitive subject can be identified by arbitrary control, if the matrix predicate does not select any argument that is an appropriate intentional agent.

Among the various interpretations, there is a group that clearly exhibits characteristics of speech act modification. As has already been pointed out by Leys (1991: 173), such uses are reminiscent of parenthetical instances of *damit*-clauses which were identified as speech act modifiers in the previous section. Likewise, Eisenberg (2004: 376) argues that these instances have a meta-communicative function.

Yet, meta-communicative *um-zu*-infinitives slightly differ from speech act related *damit*-clauses in a subtle but crucial respect: They can syntactically be fully integrated into the matrix clause, occupying the position in the Forefield, preceding the finite verb, as is illustrated in example (567). As with *damit*-clauses, meta-communicative *um-zu*-infinitives can be placed externally to the matrix clause, in the position preceding the Forefield, as shown in examples (568) and (569).⁴⁹ Similar examples have been discussed by König and Auwera (1988: 110). In order to get a clearer contrast, the same type of adverbial infinitive has been chosen in the examples given below.

- (567) Er habe etwas getrunken, sagt der 33-jährige
 he has-SBJ.PRS something drunken said the 33.years.old
 Angeklagte. Um genau zu sein, hatte der Tischlermeister
 accused around precise to be-INF had the master.carpenter
 aus St. Veit 2,4 Promille Alkohol im Blut.⁵⁰
 from St. Veit 2.4 per.mil alcohol in.the blood
 ‘The 33 year old accused said that he had drunk a bit. To be precise: The master carpenter had 2.4 per mil alcohol in his blood.’
- (568) Und Bayern ist alt. Um genau zu sein: Es ist einer der
 and Bavaria is old around precise to be-INF it is one the-GEN
 ältesten Staaten Europas.⁵¹
 oldest-GEN states-GEN Europe-GEN
 ‘And Bavaria is old. To be precise: It is one of the oldest states in Europe.’

⁴⁹ The availability of the latter pattern has been pointed out to me by Oliver Schallert.

⁵⁰ DeReKo: K98/MAR.17494 Kleine Zeitung, 05.03.1998.

⁵¹ DeReKo: E97/JUL.16625 Zürcher Tagesanzeiger, 08.07.1997.

- (569) eine amerikanische Wissenschaftlerin hatte festgestellt, dass
 a American scientist had observed that
 Frauen mehr reden als Männer. Um genau zu sein: Frauen
 women more talk than men around precise to be-IN women
 reden am Tag etwa 20 000 Wörter, Männer dagegen nur
 talk at.the day about 20 000 words men in.contrast only
 7000.⁵²
 7000

'An American scientist observed that women talk more than men. To be precise, women talk about 20.000 words per day, whereas men only speak 7000.'

Patterns in which the speech act oriented *um-zu*-infinitive is syntactically integrated into the matrix clause, as in example (567), provide a remarkable paradox. On the one hand, they appear to be integrated into the Vorfeld (Forefield) position in the matrix clause; on the other hand, they contain an operator that takes scope over the entire matrix clause. This is somewhat reminiscent of epistemic modal verbs, which involve a similar paradox. Yet, authors such as Reis and Wöllstein (2010: 155–157) assume that this type of modifier occupies a position external to the matrix clause, rather than the Forefield position. But this view is controversial, since there are speech act modifiers which occur in the middle field and which do not exhibit the intonation of parenthetical utterances, as will be shown in Section 3.4.13.

Speech act oriented adverbial *um-zu*-infinitives have already been observed by Behaghel (1924: 364), who has suggested an analysis in terms of ellipsis, as is illustrated below (cf. 570)

- (570) Um es kurz zu machen [sage ich nichts weiters als:] ich
 around it short to make-INF say I no more than I
 bleibe da;⁵³
 stay here

'In order to keep it short [I say:]: I will stay here.'

In addition to the observations made by the scholars quoted above, there is another type of adverbial infinitive in German which exhibits an ambiguity between an event related and a speech act related interpretation: *ohne-zu*-infinitives ('without to' infinitives). As with speech act oriented adverbial *um-zu*-infinitives, they are attested in two different environments: They can be integrated into the matrix clause, occupying the Forefield position preceding the finite verb (cf. 572);

52 DeReKo: BRZ07/JUL.10094 Braunschweiger Zeitung, 17.07.2007.

53 As quoted in Behaghel (1924: 364).

alternatively, they can be placed in the position preceding the Forefield, externally to the matrix clause, as is illustrated in example (571):

- (571) Ohne übertreiben zu wollen: Das ist eine Mannschaft, die in
without exaggerate to want-INF that is a team that in
der Liga eine gute Rolle spielen wird.⁵⁴
the league a good role play will
'I do not want to exaggerate: This is a team which will play an important role in the league.'
- (572) Verzeihung, aber ohne übertreiben zu wollen, sind die Beatles
sorry but without exaggerate to want-INF are the Beatles
die kommerziell erfolgreichste Popgruppe aller Zeiten,
the commercially successful-SUP pop.group all-GEN times-GEN
das kann man ruhig auch so schreiben.⁵⁵
that can one just also so write-INF
'Sorry, I don't want to exaggerate, but the Beatles are the most commercially successful pop group of all times, it is okay to put it this way.'

As illustrated above, adverbial *ohne-zu*-infinitives with a speech act related interpretation prefer environments in which they occupy a position external to the matrix clause, as is exemplified in example (571). Instances in which they are syntactically integrated into the matrix clause, as in example (572), are less frequent and mostly represent spoken language. All of the few examples with integrated *ohne-zu*-infinitives in the DeReKo belong to the Wikipedia-archive. And, as is widely known, the use of the language in Wikipedia discussions is by far less normative and closer to spoken language than in ordinary newspaper articles which make up the major part of the DeReKo.

As regards selectional restrictions, event related *ohne-zu*-infinitives impose the same type of requirements as their relatives headed by *um-zu*. Once again, speech act related *ohne-zu*-infinitives lack such restrictions on events.

3.4.11 VP adverbs

Aside from adverbial clauses, there are further types of modifiers which display an ambiguity that is reminiscent of those under discussion here, e.g. VP adverbs. Being closely related in semantic terms, these items are of particular interest for

⁵⁴ DeReKo: RHZ08/AUG.08340 Rhein-Zeitung, 09.08.2008.

⁵⁵ DeReKo: WDD11/T43.58743: Diskussion:The Beatles/Archiv/2009, In: Wikipedia – URL:http://de.wikipedia.org/wiki/Diskussion:The_Beatles/Archiv/2009: Wikipedia, 2011.

the study presented here. As discussed by Helbig and Helbig (1990: 58), there are a couple of adverb like modifiers in German that have grammaticalised into items that can be used to label a proposition as a hypothesis: *bestimmt* ‘definitely’, *kaum* ‘hardly’, *sicher* ‘certainly’, *vermutlich* ‘presumably’, *vielleicht* ‘maybe’, *wohl* ‘perhaps’. Some of them, such as *sicher*, still exhibit an ambiguity between an event related interpretation (‘safely’) and an epistemic interpretation (‘certainly’):

- (573) a. Er hält den Ball nicht sicher.
 He holds the ball NEG safe.ADV
 ‘He doesn’t hold the ball safely’ (event related)
- b. Mitja ist sicher der Mörder.
 Mitja is safe.ADV the murderer
 ‘Mitja is certainly the murderer’ (epistemic)

Again, *sicher* in its event related reading is restricted to predicates that contribute an event argument (cf. 573a), but it does not show any selectional restrictions in its epistemic reading (cf. 573b). Accordingly, epistemic adverbs are also compatible with predicates that denote states which cannot be changed. As it turns out, the analysis presented here can even be extended to adverbs that are ambiguous between an event related reading and an epistemic reading. Moreover, they are used for purposes which are similar to the ones for which epistemic modal verbs are generally employed. They indicate that the modified proposition is not based on the speaker’s direct evidence, and that it is nevertheless consistent with the knowledge of the speaker. In a similar manner, Zimmermann (2004: 256) shows that *wohl* indicates that the modified proposition is not part of the speaker’s knowledge.

Apart from these well known epistemic adverbs, there are a couple of less investigated cases which nevertheless merit more attention. Aside from its event related interpretation, the temporal adverb *plötzlich* ‘suddenly’ can also modify the proposition. In its event related interpretation *plötzlich* refers to a surprisingly abrupt change of state or an event which occurs in a very short time interval (cf. 574a), such as the disappearing of Oskar.

In its epistemic interpretation, *plötzlich* indicates that another referent has changed his evaluation of a proposition with respect to its validity in surprisingly short time. Epistemic *plötzlich*, as in example (574b) given below, is typically uttered in a context in which some other referent denies the validity of a proposition he has assessed at some earlier point. In example (574b), the staff of the hotel have known Arkan very well. Yet, in surprisingly short time, they altered their judgments claiming that they had never seen anything relevant. Thus, the use of *plötzlich* indicates that this other referent has changed his judgement of the proposition which has been uttered before in a surprisingly quick manner.

- (574) a. Gemeinsam kommen sie einem geheimnisvollen Kidnapper auf
 together come they a mysterious kidnapper at
 die Spur. Plötzlich verschwindet auch Oskar.⁵⁶
 the trace suddenly disappears also Oskar
 ‘Together, they trace a mysterious kidnapper. Suddenly, Oskar also disappears.’
 (event related)
- b. Aber die griff bei dem Mord nicht ein. Dabei ging der
 but the catch at the murder NEG in though went the
 47-jährige Arkan im “Intercontinental” ein und aus. Man
 47-years.old Arkan in.the Intercontinental in and out one
 kannte ihn gut - und plötzlich hat niemand etwas
 knew him well and suddenly has nobody something
 gesehen.
 see-PPP
 ‘But they did not intervene in the case of that murder. But then, the 47-years-old
 Arkan could enter and leave the “Intercontinental” without any problem. He was
 well known there. – but suddenly everybody claims to have never seen anything.’
 (epistemic)

The adverbial *gerade eben* ‘just a minute ago’ can be used in an analogous function, in which it modifies the validity of the proposition.

Likewise, the temporal adverbial *jetzt* can occur in environments in which it does not display an event related interpretation (cf. 575b–575c). In its canonical use, it is a deictic adverbial which indicates that the Time of Utterance (cf. 575a) is contained in the Topic Time. Accordingly, it should not be compatible with events in the past. Moreover, it fails to embed states that cannot be changed. Nevertheless, it can be found in both contexts (cf. 575b– 575c). As it turns out, *jetzt* refers to the speech act event itself, rather than the event provided by the VP. This use is primarily found in *wh*-questions and polarity questions:

- (575) a. Meine Damen und Herren, Herr Abgeordneter Albers hat
 My ladies and gentlemen mister representative Albers has
 jetzt das Wort, und wir hören ihm genau zu.
 now the word and we listen him closely to
 ‘Ladies and Gentlemen, now we admit Mr. representative Albers to the floor and we
 will listen to him carefully.’ (event related)

56 DeReKo: HMP11/APR.02251 Hamburger Morgenpost, 28/04/2011.

56 DeReKo: K00/JAN.04204 Kleine Zeitung, 18/01/2000.

56 DeReKo: PNI/W15.00098 Protokoll der Sitzung des Parlaments Landtag Niedersachsen am 21/09/2006.

- b. Womit die wichtigste Frage unbeantwortet bleibt:
 whereby the important-SUP question unanswered remains
 Sind jetzt die Schweizer Bankiers Halunken oder nicht?⁵⁷
 are now the Swiss bankers scoundrels or NEG
 ‘However, the most important question remains unanswered: Are Swiss bankers
 scoundrels or aren’t they?’ (epistemic)
- c. Und, waren Sie jetzt Spion oder nicht?⁵⁸
 and were you now spy or NEG
 ‘Once again, have you ever been a spy or haven’t you?’ (epistemic)

In its event related interpretation, *jetzt* indicates that the Time of Utterance is part of the interval associated with the predicate of the sentence. Whenever it is interpreted with respect to the speech act, *jetzt* expresses that the Time of Utterance is part of the interval in which it is relevant to find an answer to the given question; that it is part of the interval associated with the speech act event. The latter use of *jetzt* is typically used in situations in which the speaker is impatiently waiting for the answer to the question, and has probably asked the addressee this question a couple of times without getting a satisfying answer. In contrast to its temporal event related interpretation, *jetzt* is preferably unstressed in its speech act use. In this latter use, *jetzt* cannot be replaced by unambiguous temporal adverbs or adverbials with a similar meaning, such as *gegenwärtig* or *in diesem Moment*. In contrast, *jetzt* can be replaced without any problem with its more archaic counterpart *nun* ‘now’ in both uses.

- (576) a. Yes ... Well, you delivered two boxes. I think it is a total of 5,000 campaign buttons.
- b. Now, all the ones we had before and our slogan is *we ARE the people* and *are* is underlined. These new buttons have *we* underlined as means *WE are the people* ... Well, I think there is a difference, *we ARE the people* is not the same as *WE are the people*. That’s not fine. Look, we make it really simple, we don’t pay for the buttons, we throw them away.⁵⁹

The group of VP adverbs which can be interpreted in an epistemic manner appears to be fairly comprehensive. The readings of *completely* discussed in Lassiter (2011: 13, 73) illustrate that.

- (577) a. MARY: The president is not tall.

57 DeReKo: E98/DEZ.32992 Zürcher Tagesanzeiger, 22/12/1998.

58 DeReKo: 000/JAN.06392 Neue Kronen-Zeitung, 17/01/2000.

59 *Taxi Driver*, Martin Scorsese, 11:40 playing time, transcription JM

- b. SUE: Uh, uh! He is completely tall.

What *completely* modifies in example (577b) is not the property of being tall, but rather the validity of the assertion.

Probably, the group of VP adverbs which are ambiguous between an epistemic and a speech act related interpretation is much greater than the selection presented here. As it seems, a large number of such cases has not even been identified yet.

3.4.12 Locative modifiers

In a recent publication, Maienborn (2004: 162) has pointed out that, under certain conditions, locative modifiers may also be interpreted epistemically. According to traditional assumptions (cf. Kratzer (1995: 127)), locative modifiers are restricted to predicates that provide an event argument and become ungrammatical whenever combined with a predicate that refers to a state that cannot be changed. As Maienborn (2004: 162) demonstrates, this is not quite true, since locative modifiers such as *in the car* in example (578b) can function as a frame modifier, conveying an epistemic reading.

- (578) a. In the car, Mary was tired. (event related)
 b. In the car, Mary was blond.
 ‘In the car, (you still claimed that) Mary was blond’ (epistemic)

As Maienborn (2004) observes, the epistemic interpretation arises whenever the locative modifier bears scope over a predicate which takes a definite subject referent, and which refers to a state that cannot be changed. This is exactly what is predicted by the analysis proposed in the present study.

The interpretation of epistemic locative modifiers is somewhat reminiscent of quotative modal verbs. The function of relativisation applies with respect to the speaker, who stresses that the modified proposition is based on his own direct evidence. However, the commitment to the truth is not evaluated with respect to the speaker. In example (578b), some other referent is committed to the truth, who is indirectly introduced by the situation to which the locative modifier *in the car* refers. The referent has to be a person that was present in the car. Crucially, it is not the speaker who signals that the modified proposition is consistent with his knowledge. In some cases, he could know that this proposition is even false. By contrast, the referent introduced by the locative modifier has made a commitment to the truth of the proposition in the situation when he was in the car. This use of locative modifiers is reminiscent of the epistemic interpretation of *plötzlich* discussed in Section 3.4.11.

3.4.13 *noch einmal*

Furthermore, there are temporal adverbs that can be employed to modify a speech act. In its canonical temporal use, *noch* ‘still, yet’ can be considered a durative adverb, as suggested by Eisenberg (2004: 217). As is argued in Eisenberg et al. (2005: 582), durative *noch* additionally involves expectations of the speaker. In other words, it specifies a given moment in a temporal interval just before the speaker expects it to end. Whenever *noch* modifies the temporal adverb *einmal* ‘once’, which is classified as iterative by Eisenberg (2004: 218), it can be used to modify speech acts.

In contrast to its event related reading, the speech act related use of *noch einmal* indicates the iteration of the entire act of the utterance, rather than the iteration of the matrix event. Accordingly, its use implies that the speaker has already uttered the same act to the addressee before.

As is demonstrated in examples (579)–(581), the compound *noch einmal* can modify assertions. Moreover, it can also modify other illocutionary acts, e.g. questions (cf. 582–586).

- (579) Noch einmal: Dutschke war kein Pazifist, aber er legte keine
once again Dutschke was no pacifist but he lie no
Bombe.⁶⁰
bomb

‘Once again: Dutschke was no pacifist, but he did not plant a bomb.’

- (580) LAMBRECHT: Noch einmal: Mich interessieren die Inhalte und
Lambrecht once again me interests the content and
weniger, wer welches Ministerium besetzt.⁶¹
lee who which ministry occupies

‘LAMBRECHT: “Once again: I am interested in the content and less in who occupies which ministry.”’

- (581) FISCHER: Noch einmal: Die Verhandlungen mit der ÖVP sind
once again the negotiations with the ÖVP are
gescheitert.⁶²
failed

‘FISCHER: “Once again: The negotiations with the ÖVP have failed.”’

⁶⁰ DeReKo: NUN04/DEZ.01147 Nürnberger Nachrichten, 10/12/1004.

⁶¹ DeReKo: M05/OKT.83589 Mannheimer Morgen, 13/10/2005.

⁶² DeReKo: K00/JAN.05638 Kleine Zeitung, 22/01/2000.

- (582) Irgendwie erinnert einen das alles an etwas: diese
 somehow remembers one that all about something these
 Collagen aus bildhaften Elementen und Textbruchstücken, diese
 collages of pictorial elements and text.fragments these
 geometrischen Formen, die sich zu Gesichtern und
 geometrical forms that REFL to faces and
 menschlichen Figuren zusammenfügen. Wer hat noch einmal so
 human figures coalesce who has once again so
 gemalt? Man kommt nicht drauf.⁶³
 painted one comes NEG on.it
 ‘Somehow, this reminds you of something: These collages made of pictorial elements
 and text fragments, these geometrical forms that coalesce to faces and human figures.
 Once again: Who has painted like that? You cannot guess it.’
- (583) Noch einmal, wer holt die Katze aus dem Sack?⁶⁴
 once again who takes the cat out the bag?
 ‘Once again, who takes the cat out of the bag?’
- (584) Wie lautet noch einmal das neue Wort des Jahres?
 How sounds once again the new word the-GEN year-GEN
 Richtig: Wutbürger.⁶⁵
 right Indignant.Citizen
 ‘What is the new word of the year again? Right: Indignant Citizen.’
- (585) Philipp Lahm: Wer ist noch einmal Maicon?⁶⁶
 Philipp Lahm who is once again Maicon
 ‘Philipp Lahm: Once, who is Maicon again?’
- (586) Wie heißt das Krankenhaus nochmal?⁶⁷
 how is.called the hospital once.again
 ‘What is again the name of the hospital?’

It deserves closer attention that the two interpretations of *noch einmal* are characterised by a contrast which is reminiscent of the contrast between circumstantial and epistemic modal verbs. The different uses of *noch einmal* are characterised by an analogous difference regarding their selectional restrictions: *Noch einmal* is confined to the modifications of predicates that carry an event argument in its

⁶³ DeReKo: RHZ11/NOV.22192 Rhein-Zeitung, 21/11/2011.

⁶⁴ DeReKo:SOZ10/DEZ.00220 Die Südostschweiz, 01.12.2010.

⁶⁵ DeReKo: M10/DEZ.89119 Mannheimer Morgen, 21/12/1010.

⁶⁶ DeReKo: NUN10/JUL.00511 Nürnberger Nachrichten, 05/07/2010.

⁶⁷ Wolfgang Herrndorf, *Tschick*, p. 209, (2010).

event related interpretation. The modification of predication consisting of an identified individual and a predicate that refers to a state which cannot be changed is not possible.

As a consequence, in examples (579), (584)–(586), only a speech act related interpretation of *noch einmal* is possible. Secondly, it is to a lesser degree compatible with past related predicates, if *noch einmal* remains unstressed, as is illustrated in examples (581) and (582).

Apart from that, the speech act related use of *noch einmal* is characterised by a further remarkable peculiarity. As with the adverbial *um-zu-* and *ohne-zu-* infinitives discussed in Section 3.4.10, it can alternatively be realised in a position that is syntactically integrated into the matrix clause, or in a position that is external to the matrix clause. Whenever the speech act related use of *noch einmal* modifies a question, it can occupy a position outside of the matrix clause, as exemplified in example (583). In this type of configuration, it fails to be interpreted in an event related manner. Moreover, it can be part of the matrix clause, as illustrated in examples (584)–(586). Nevertheless, *noch einmal* takes scope over the *wh*-operator, yielding an interpretation like: ‘Once again I want to know from you: What is the new word of the year?’ These configurations appear to involve speech act modifiers which are integrated into the matrix clause, challenging the view held by Reis and Wöllstein (2010: 155), who argue that the typical position for non-integrated adverbial clauses is always external to the matrix clause.

Once again, cases of speech act related *noch einmal* that are syntactically integrated into the matrix clause reveal a remarkable paradox. On the one hand, they are integrated into the matrix clause and on the other hand, they contain an operator that takes scope over the entire matrix clause. In this respect, they share an essential characteristic with epistemic modal verbs, which are also part of the matrix clause, and which take scope over at least the entire proposition.

Similarly, the English counterpart *again* is attested as a speech act modifier as well.

(587) Again, I have modified the notation to match with what I am using in this dissertation, so that Kratzer’s $\prec_{g(w)}$ order on worlds corresponds to $\succ_{g(w)}$ here.⁶⁸

In this context, the adverb *again* does not indicate the iteration of the event of modifying the notation; rather, it iterates the entire speech act.

⁶⁸ Daniel Lassiter: Measurement and Modality. The Scalar Basis of Modal Semantics. PhD-thesis, New York University. 2011

3.4.14 Past operator

Aside from that, there are even abstract operators that are ambiguous between an event related interpretation and one that is closely related to the epistemic interpretation of modal verbs. As Kratzer (1995: 155) argues, the past tense operator typically exhibits characteristics of an event modifier. This becomes most obvious in some cases in which it modifies a predicate that refers to a state that cannot be changed. This predicate will be reinterpreted as a predicate that denotes a state that is temporarily confined, just like a predicate that contributes an event argument does:⁶⁹

The past tense is an effective tool for turning individual-level predicates into stage-level predicates. In this case, the tense predicate is a predicate for a Davidsonian argument

In some particular cases in which the individual and the property cannot be separated, a past tense operator will yield an interesting effect. In its most natural interpretation, example (588) implies that the individual Henry is located in the past, in other words that he is not alive anymore. Kratzer argues that, in this reading, the predicate *French* lacks an event argument. As a consequence, the past tense operator has to modify another element. She concludes that what is located in the past is not an event, but the individual Henry.

(588) Henry was French.

In a more uniform analysis of the past tense operator, one could assume that it acts as an event modifier in these cases as well. Accordingly, *French* would be reinterpreted as a temporary confined state, supplied with an event argument by means of a pragmatic mechanism like the ones suggested by Kratzer (1995: 148) and Maienborn (2003: 178, 193, 216). The implication that Henry is not alive anymore could then be considered to be a result of a pragmatic conclusion: If the properties of being Henry and being *French* cannot be separated and if the event of *x* being *French* is located in the past, the event of *x* being Henry is also located in the past.

The past tense operator behaves in a similar way in German, as is shown in example (589). Yet, there are contexts in which the use of a past tense operator with an inseparable property does not imply the decease of the individual encoded as the subject of the clause. When I met a former fellow student who had forgotten a little bit of my personal background, she asked me again about my origin by uttering example (590).

⁶⁹ Cf. Kratzer (1995: 155).

- (589) Hermann Maier war aus Österreich.
Hermann Maier was from Austria
'Hermann Maier was Austrian.'
- (590) Du warst doch aus Österreich.
you were PART from Austria
'As far as I remember, you told me once that you were from Austria.'

What is located in a past time interval is neither the property of being Austrian nor my presence, but the validity of the proposition 'Jakob is from Austria'. What my former fellow student wanted to indicate is that she had forgotten to what extent this proposition is indeed valid. Crucially, she refers to a context in the past in which the proposition was evaluated as true. Arguably, the example given above is more complex, because it was used as a type of tag question, as the presence of the particle *doch* indicates. The intention behind this utterance in example (590) is to communicate that the embedded proposition was valid in a certain context in the past, e.g. that it was asserted by some discourse participant.

3.4.15 Meta-communicative *why*

Finally, there are other types of operators that can be ambiguous between an event related, and an epistemic or a speech act related, interpretation. As Ginzburg (2012: 308) has demonstrated, there are adverbial *wh*-pronouns that can alternatively bear scope over a speech act. In its canonical event related use, *why* is a request to the addressee to indicate the cause of a given event or state. By contrast, the use of *why* in example (591c) is not a request to provide the cause of a certain event; rather, Jerry wants to know the reason which causes Emma to ask when she last saw him in example (591b). Accordingly, what is modified here is not an event but the entire speech act. This short discourse is taken from Harold Pinter's *Betrayal* and has been provided by Ginzburg (2012: 308):

- (591) a. JERRY: How's Robert?
b. EMMA: When did you last see him?
c. JERRY: I haven't seen him for months. Don't know why. Why?
d. EMMA: Why what?
e. JERRY: Why are you asking when I last saw him.

In a similar manner, meta-communicative questions can be used to modify epistemic assumptions, as is illustrated in the constructed conversation below. The example contains the German counterpart of meta-communicative *why*, which is realised as the *wh*-pronoun *warum*.

- (592) a. A: Wer könnte das Feuerzeug hier vergessen haben?
 who could the lighter here forgot have-INF
- b. B: Tanja hat das Feuerzeug vergessen.
 Tanja has the lighter forgot
- c. A: Warum?
 why
- d. B: Weil sie ist die einzige hier im Haus, die
 because she the only here in.the house is who
 raucht.
 smokes
- 'A: Who may have forgot this lighter?'
- 'B: Tanja has forgot it.'
- 'A: Why?'
- 'B: Because she is the only one here who smokes.'

In its meta-communicative use, the *w*-pronoun *warum* can alternatively be replaced by *wieso*. In their ability to modify *wh*-questions and assumptions, meta-communicative *why* and *warum* are reminiscent of epistemic and speech act related *because*-clauses. In other words, meta-communicative *why* and *warum* are the direct *wh* counterparts of epistemic *because* and *weil*-clauses. This is most convincingly demonstrated in the discourse given above, in which B employs an epistemic *weil*-clause with verb second verb order (cf. 592d) to answer the meta-communicative *warum* question. Alternatively, an epistemic *weil*-clause with verb final order of the type that has been observed by Scheutz (1999: 97) is also acceptable in this context..

3.4.16 Declarative questions

As has been pointed out by Gunlogson (2001: 80–100) as well as Truckenbrodt (2006: 259, 272), declarative questions are characterised by a peculiar constraint, the *Contextual Bias Condition*: In order to utter a declarative question felicitously, it is presupposed that 'the addressee believes *p*'. In example (593), the addressee has either directly or indirectly conveyed that his cousin is sorry.

- (593) Es tut ihm LEID?
 it does me pain
 'He is SORRY?'

However, this information is surprising to the speaker and, therefore, he asks for confirmation, focusing the complex predicate *leid tun* 'be sorry', which results on

a high pitch accent on the non-finite part *leid*. Obviously, he took it for granted that among the two focus alternatives {'Es tut ihm leid', 'Es tut ihm nicht leid'} the negated one is the appropriate one. In other words, the meaning of this utterance could be paraphrased as: *Is it really the case that he is SORRY?*

However, there are instances of declarative questions in German which are not subject to the *Contextual Bias Condition*. Some native speakers use declarative questions in a peculiar manner: Imagine an argument between two people, who have fixed an appointment to go to the theatre. Speaker B arrives 30 minutes late. Speaker A is very upset for having waited for so long, sulks and refuses to talk to Speaker B. But B does not really know what to say in order to calm him down, so she asks the question in example (594):

- (594) Es tut mir leid?
 it does me pain
 'I am sorry? (Is it that what you are expecting from me to say?)'

By contrast, the interpretation of example (594) cannot be translated as: 'Is it really the case that I am SORRY?' In this situation, it does not make any sense for the speaker to ask a different person about his own private feelings. This addressee will certainly not know better than the speaker. It is even more strange to assume that the addressee believes that the speaker is sorry, while the speaker himself does not know whether he is sorry. Hence, the absence of a contrastive focus also explains why the question does not exhibit any high pitch accent. The question is only marked by a high boundary tone H%.

What the speaker wants to know is rather whether the speech act of saying that she is sorry is considered as valid by the addressee. This question can be rephrased as: 'Is it that proposition which is valid for you and which you want me to add to the common ground?' Once again, the deictic centre is moved from the speaker to the addressee. This sort of context shift, which is caused by the question operator, is reminiscent of the behaviour of epistemic modal operators in questions, as shown in Section 4.11 and 4.12.

3.4.17 Summary

In this section, a whole range of related ambiguous modifiers in German were reviewed. All of them modify lexical predicates; yet, the syntactic realisation of those predicates differ from modifier to modifier. Whereas modal verbs modify non-finite complements, adverbial modifiers modify the matrix predicate of a finite clause. It has been shown that, despite their semantic differences, the ambiguous modifiers reviewed here behave analogously in a crucial matter. In their

original interpretations, they impose selectional restrictions on the lexical predicate with respect to the specification of the event argument it contains. In their less canonical readings, these selectional restrictions are no longer active. From this it follows that there are modifiers that are ambiguous between an event related and a propositional or even speech act related interpretation.

Regarding their semantic nature, two groups of modifiers have to be distinguished: Firstly, there are modifiers that, in their original variant, impose very strict restrictions on the lexical predicate with respect to the specification of the event argument it provides. Circumstantial modal verbs fail to embed predications consisting of an individual and a predicate that refers to an eternal state or a event in the past.

From this, one could conclude that circumstantial modal verbs are restricted to the modification of predicates that involve an event argument which is not completed by the Time of Utterance. In other words, they are event modifiers. This equally holds for canonical *wenn*-conditionals, which are assumed to also carry a (circumstantial) modal operator. Likewise, VP adverbs and locative modifiers require lexical predicates that involve an event argument. To a lesser extent, this behaviour is found with causal *weil*-clauses, *noch einmal*, meta-communicative *warum* and the past tense operator. In their more grammaticalised variants, most of these modifiers can be used as genuine epistemic modifiers, which indicates that the modified proposition is not part of the deictic centre's knowledge. In their epistemic interpretations, these modifiers cease to be event modifiers. As their selectional restrictions with respect to the event type are dropped, they rather act as propositional or even as speech act modifiers.

Secondly, there are modifiers that are less restrictive with respect to the event type of the matrix predicate in their original variant, such as concessive *obwohl*-, *wobei*-, *wiewohl*-clauses, temporal *während*-clauses, *solange*-clauses and *bevor*-clauses, final *damit*-clauses, adverbial *um-zu*- and *ohne-zu*-infinitives. Yet, all of these modifiers exhibit selectional restrictions of some type, though they are not always formulated with respect to the event type that is provided by the matrix predicate. These restrictions are idiosyncratic and differ from modifier to modifier. In contrast, their more grammaticalised variants do not involve such selectional restrictions. Furthermore, they also differ from genuine epistemic modifiers with respect to their interpretation. Whereas epistemic modifiers are interpreted with respect to the deictic centre's knowledge, the modifiers of the present group are not. Instead, they modify the speech act. Accordingly, corrective *obwohl*-, *wobei*-, *wiewohl*-clauses, contrastive *während*-clauses, *solange*-clauses, *bevor*-clauses, *damit*-clauses, adverbial *um-zu* and *ohne-zu* infinitives should be considered as speech act modifiers.

At this point the question arises to what extent epistemic modifiers and speech act modifiers are of the same type. In her study, Sweetser (1990) meticulously keeps these two interpretations apart, arguing that the distinction is a result of their processing in different mental domains. Yet, her classification is not so obvious. As suggested in Maché (2012: 115), epistemic modifiers can be seen as a subtype of speech act modifiers; more precisely, as speech act modifiers that modify assertive speech acts. Such an account is supported by the fact that the epistemic and the speech act related interpretation of causal conjunctions in French are realised by the same lexical means: *puis que*, as the data collected by Sweetser (1990: 81) illustrates. By contrast, event related causal clauses are headed by the conjunction *parce que*. In order to maintain Sweetser's analysis, it is necessary to demonstrate that there are languages or earlier stages of languages in which the epistemic and the speech act related interpretation of a given type of conjunction is realised by different lexical items. Aside from that, it remains to be shown that the epistemic interpretation of the known conjunctions indeed developed prior to the corresponding speech act interpretation. In any case, the precise relationship between the epistemic and the speech act related interpretations of a given conjunction is not fully understood yet. The terminology for the modifiers discussed in the previous sections is therefore not uniform.

At any rate, there are aspects that indicate a close relationship between epistemic and speech act related modifiers. As has been demonstrated in the previous section, there are a couple of modifiers that are syntactically integrated into the matrix clause and that can bear scope over the entire speech act that is associated with the matrix clause, such as *noch einmal* and adverbial *um-zu* and *ohne-zu* infinitives. This behaviour is reminiscent of that of epistemic modal verbs, which are integrated into the matrix clause syntactically and which seem to bear scope at least over the proposition.

Of course, the enumeration of epistemic modifiers given above is not exhaustive, and there are certainly many other related phenomena which remain to be discovered. Moreover, there are types of epistemic modifiers which have not received much attention yet, such as the speech act predicates described by Sweetser (1990: 69), based on an observation made by Tregidgo (1982: 76). As she argues, speech act predicates such as *insist* are ambiguous between a circumstantial and an epistemic interpretation. In their circumstantial interpretations, they encode an obligation: 'I insist that you go to London'; in their epistemic use, they encode a commitment to the truth: 'I insist that you DID go to London'. Interestingly, the epistemic use is once again compatible with a past event, whereas the circumstantial use does not seem to be.

Despite their semantic heterogeneity, it cannot be denied that the modifiers reviewed in this section share some essential characteristics. Firstly, they involve

selectional restrictions in their more original variant, most likely to be formulated with respect to the specification of the event provided by the modified predicate. Secondly, these selectional restrictions are no longer active in their more grammaticalised variant. This indicates that the more grammaticalised variants occupy a higher position in the clausal hierarchy.

3.5 Ambiguities across languages

Epistemic modality has been most extensively investigated with respect to modal verbs or auxiliaries. Initially, the research focused on West Germanic languages, in particular English, German and Dutch. In the course of time, different suggestions have been developed on how to cope with the systematic ambiguity of these modifiers such as the analyses put forth by Ross (1969: 86), Fourquet (1970), Jackendoff (1972: 102), Lyons (1977: 791), Kratzer (1978) and Kratzer (1981), Palmer (1986), Öhlschläger (1989), Sweetser (1990), Brennan (1993), Diewald (1999), Abraham (2001), Reis (2001), Erb (2001), Wurmbrand (2001), Nuyts (2001a) and Nuyts (2001b), Butler (2003), Roberts (2003) and Lassiter (2011). Regardless of the different views they take, they all agree that circumstantial modals denote a possibility or necessity in the external world, and that epistemic modals refer to some abstract necessity or possibility in the internal knowledge of the speaker.

In more recent research, the attention was extended to further languages: Germanic languages such as Danish Boye (2010), Norwegian Eide (2005) and further Scandinavian languages Thráinsson and Vikner (1995), Romance languages such as Italian (Milan (2001), Pietandrea (2005) and Hacquard (2006: 31)), French Hacquard (2006: 25) and Spanish Demirdache and Uribe-Etxebarria (2008: 1809). As illustrated by Hacquard (2006: 31), the two Italian modal verbs which usually express circumstantial modality, the possibility modal verb *potere* ‘can’ and the necessity modal verb *dovere* ‘must’ can alternatively be interpreted in an epistemic way. Instances of the epistemic variant are given in examples (595) and (596). Furthermore, she shows that the same contrasts hold for the French possibility modal verb *pouvoir* and its necessity counterpart *devoir*, as pointed out in examples (597)–(598). A similar example is provided by Cornillie et al. (2009: 109). Moreover, Hacquard (2006: 25, 55) provides further examples of the epistemic possibility modal verb *pouvoir* and the epistemic necessity modal verb *devoir* in a slightly different configuration, as exemplified in examples (599) and (600). Furthermore, Demirdache and Uribe-Etxebarria (2008: 1809) point out that this type of ambiguity can also be found in Spanish. The necessity modal verb *deber*, which originally expressed circumstantial modality, additionally admits an epistemic reading, as illustrated in example (601).

- (595) Bingley può aver parlato a Jane.
Bingley might have-INF speak-PPP to Jane
'Bingley might have spoken to Jane.' (epistemic)
- (596) Bingley deve aver parlato a Jane.
Bingley must have-INF speak-PPP to Jane
'Bingley must have spoken to Jane.' (epistemic)
- (597) Bingley peut avoir parlé à Jane.
Bingley might have-INF talk-PPP to Jane
'Bingley might have talked to Jane.' (epistemic)
- (598) Bingley doit avoir parlé à Jane.
Bingley must have-INF talk-PPP to Jane
'Bingley must have talked to Jane.' (epistemic)
- (599) Jane a dû prendre le train.
Jane has must-PPP take-INF the train
'Given my evidence now, it must be the case that Jane took the train then.' (epistemic)
- (600) Bingley a pu parler à Jane.
Bingley has can-PPP speak-INF to Jane
'Given my evidence now, it could be the case that Bingley spoke to Jane then.' (epistemic)
- (601) Pedro ha debido ganar la carrera.
Pedro has must-PPP win-INF the race
'Pedro must have won the race.' (epistemic)

As the Italian and French examples (595)–(598) illustrate, the epistemic modal verbs are combined with predicates that refer to an event in the past. A circumstantial interpretation is hardly plausible for these instances. In this respect, the epistemic variants of *potere* and *dovere* in Italian and *pouvoir* and *devoir* in French behave in the same way as their German counterparts. This indicates that the circumstantial interpretations of these verbs are, once again, to be analysed as event modifiers, whereas their epistemic relatives are to be seen as propositional or speech act modifiers.

In a less obvious way, this also holds for the epistemic patterns illustrated in examples (599)–(601). These instances involve an inverse scope interpretation of the modal operator and the tense operator. From a strictly morphological and syntactic perspective, the perfect tense auxiliary takes scope over the epistemic modal verb, which is realised as a past participle in each case. However, as far as the semantic interpretation is concerned, the epistemic modal operator bears scope over the perfect tense operator. This results in a configuration in which the modal operator modifies a predicate that refers to an event in the past. In this respect,

these epistemic modal verbs are similar to their relatives in German. As will be illustrated in Section 4.2, such patterns also occurred in earlier stages of German.

As the data collected by Bolkestein (1980: 89–103, 123–133) shows, the ambiguity of these verbs is not a recent development. Rather, their Latin counterparts could already be interpreted in a circumstantial and an epistemic manner, such as the necessity verb *debere* ‘must’, which is attested with an epistemic interpretation from the first century AD, as is illustrated in examples (602)–(604). Moreover, the impersonal pattern *oportet* ‘it is necessary that’, which exhibits an analogous ambiguity, can already be found two centuries earlier in Plautus and Cicero, as demonstrated in examples (605)–(606). Once again, Bolkestein’s examples contain numerous cases in which the epistemic modal verb embeds either a predication consisting of an individual and a predicate that refers to a state that cannot be changed, or a predicate that refers to an event in the past.⁷⁰

- (602) *paenitentia hoc primum debet invenisse*⁷¹
 regret-NOM this-ACC at.first must-3SG.PRS find-INF.PRF
 ‘Regret must at first have found this out.’
- (603) *debent accommodatae esse et equorum*
 must-3PL.PRS accomodate-PPP.PL.NOM be-INF also horse-PL.GEN
naturae neque ex alia causa nomen
 nature-GEN and.NEG from other-F.ABL causa-ABL name-ACC
*accepisse*⁷²
 acquire-INF.PRF
 ‘They must also be common for horses of the nature rather than having acquired their name for some other reason.’
- (604) *plane hic debet servus esse nequissimus*⁷³
 clearly this-NOM must slave-NOM be-INF wretched-SUP
 ‘Clearly, this must be the most wretched slave.’
- (605) *haud longe abesse oportet, verum longe hinc afuit*⁷⁴
 NEG far away.be-INF must but far from.here away.was
 ‘He must be somewhere near, although he was far away.’

⁷⁰ I am indebted to Till Kulawik, who generously shared his expertise of Latin with me.

⁷¹ Plinius, *Naturalis Historia* 9, 140 (77 AD), as quoted in Bolkestein (1980: 123). Glossed and translated by Till Kulawik and JM.

⁷² Plinius, *Naturalis Historia* 22, 30 (77 AD), as quoted in Bolkestein (1980: 123). Glossed and translated by Till Kulawik and JM.

⁷³ Petron, *Satyricon* 49,7, (First century AD) as quoted in Bolkestein (1980: 123). Glossed and translated by Till Kulawik and JM.

⁷⁴ Plautus, *Amphitruo*, 322 (?200 BC), as quoted in Bolkestein (1980: 89). Glossed and translated by Till Kulawik and JM.

- (606) servum hercle te esse oportet et nequam
 slave-ACC for.Hercules'.sake you-ACC be-INF must and wretched
 et malum⁷⁵
 and bad-M.ACC
 'You must really by a wretched and bad slave.'

In examples (602) and (603) *debere* embeds an infinitive with a specific perfect morpheme *-isse*, which indicates that the event has already been accomplished in the past. In examples (603) and (604), *debere* modifies a predicate which refers to a state which cannot be changed. In these respects, it behaves fairly similarly to its German and English counterparts *müssen* and *must*.

However, *oportet* is more complicated. It can be used in an impersonal pattern, as illustrated in example (605). In example (606), it is even realised as an impersonal ACI verb. In any case, it can embed predicates which refer to a state that cannot be changed.

Apart from that, there are possibility and necessity verbs in Romanian that are ambiguous between a circumstantial and an epistemic interpretation. Yet, they require a more complex configuration. As Hill (2011: 27) points out, the possibility verb *putea* 'can' in Romanian yields an epistemic interpretation under two conditions: either it is embedded under a conditional auxiliary and selects a bare infinitive complement (cf. 607), or it selects a finite clause complement which is specified for the subjunctive of the present (cf. 608). The necessity verb *trebui* 'need' exhibits the same sort of ambiguity in the latter type of environment (cf. 609), as has been illustrated by Cornillie et al. (2009: 115).

- (607) Ar putea pleca.⁷⁶
 COND.AUX-3SG/PL can go-INF
 'She/He/They could go.' (ability; permission; epistemic)
- (608) Ar putea să plece.⁷⁷
 COND.AUX-3SG/PL can that go-SBJV.PRS.3SG/PL
 'She/He/They could go.' (ability; permission; epistemic)
- (609) Dunărea trebui-e să fi-e aproape.⁷⁸
 Danube.ART need-IND.PRS.3SG/PL that be-SBJV.PRS.3SG near
 'The Danube must be near.' (epistemic)

As the example with epistemic *trebui* (609) indicates, the epistemic modal verb once again occurs with a type of predicate that refers to a state that cannot be

⁷⁵ Plautus, *Poenulus*, 1030 (190 BC), as quoted in Bolkestein (1980: 89). Glossed and translated by Till Kulawik and JM.

changed. Once again, a circumstantial interpretation is excluded. As has been discussed above, it is reasonable to assume that this type of predicate does not carry an event argument. This, in turn, supports the assumption that circumstantial modal operators are event modifiers, and that epistemic modifiers embed elements that are more complex than that, such as propositions or speech acts.

To a lesser extent, modal verbs exhibit this type of ambiguity in Slavic languages, as in the case of Russian *moch'* ('can, be able to'), as demonstrated by Kotin (2008: 382). Furthermore, ambiguous modal verbs occur in Greek (*prepi* 'must' and *bori* 'may') and in other Indo-European languages, too. Hansen and De Haan (2009) provide a comprehensive overview.

Yet, such patterns are not restricted to Indo-European languages. As Adéwólé (1990, 1993) has pointed out, Yorùbá has developed a system of ambiguous modal verbs consisting of the possibility verb *lè*, which covers the meanings of its English counterparts *may*, *might*, *can* and *could*, and the necessity verb *gbòdò* 'must'. Interestingly, the circumstantial and the epistemic variants of these verbs exhibit the same distributional restrictions.

As Adéwólé (1990: 79) illustrates in more detail, *gbòdò* is restricted to an epistemic reading whenever it takes complements which refer to an event prior to the Time of Utterance, as indicated in examples (610)–(611). In subsequent work, Adéwólé (1993: 43) has put forth that the possibility verb *lè* behaves in an analogous way (cf. 612).

- (610) Ó ti gbòdò lọ ò sùrè ní íta.
 he PRF must go play at outside
 'He must have gone out to play.' (epistemic)
- (611) léèsì tò wò sòrùn ti kóbó, ojú rẹ̀ ti gbòdò rí
 lace REL.PRN wear neck PRF NEG.CL-fade eye his PRF must see
 ǹnkan
 something
 'The lace garment he is wearing has faded, he must have suffered.' (epistemic)
- (612) Ó ti lè lọ ò sùrè ní íta.
 he PRF may go play at outside
 'He may have gone out to play.' (epistemic)

In configurations in which the verb is interpreted in an epistemic way, the perfect marker *ti* may immediately precede the modal verb, rather than the embedded verb. This behavior is reminiscent of French and Spanish. In these languages, the perfect morphology may attach to the epistemic modal verb while it is interpreted on the embedded infinitive, resulting in an inverse scope of the modal operator and the epistemic operator, as shown in examples (599)–(601) given above and in Section 4.2.

Furthermore, Adéwólé (1993: 39) observes that stative predicates are neatly compatible with the epistemic variants of the possibility verb *lè*, as indicated in example (612). Its counterpart appears to function in an analogous manner, as example (614) taken from Adéwólé (1990: 80) suggests.

- (613) Ó lè wà nílé, ó sì lè má sí nílé.
 he may be at.home he even may NEG be at.home
 ‘He may be at home, he even may not be at home.’ (epistemic)
- (614) Ó gbòdò wà nílé.
 he must be at.home
 ‘He must be in.’ (epistemic)

As De Haan (1997), Drubig (2001) and Butler (2003) illustrate, modal operators which display an ambiguity between circumstantial and epistemic modality can moreover be found in other non-Indo-European languages, such as Finnish (*täytyy* ‘must’, *voi* ‘can’) and Malay *mesti* ‘must’, *boleh (jadi)* ‘may’.⁷⁹

Finally, Auwera, Ammann and Klindt (2005: 257) point out that poly-functional modal verbs, which are ambiguous between a circumstantial and an epistemic interpretation, are widely attested in Indo-European languages. Moreover, they can be found in languages that are in geographical or cultural proximity of Indo-European languages.

In general, the cross-linguistic data which has been reviewed here supports the analysis developed in Section 3.2, according to which circumstantial modal operators are treated as event modifiers. This conclusion is based on the observation that epistemic modal verbs in many languages tend to modify predications that are incompatible with circumstantial modal verbs. These predications involve predicates that cannot be changed or that refer to an event in the past. As has been shown by Kratzer (1995: 126) and Maienborn (2003: 106), the first diagnostic leads to the conclusion that these predicates do not involve event arguments. The particularity of epistemic modifiers could be rephrased as the ability to modify predications that lack an event argument. In contrast, circumstantial modal verbs require predicates that can be interpreted as events. As a consequence, circumstantial modal verbs are event modifiers and epistemic modal verbs are propositional modifiers or even speech act modifiers. The specific nature of that latter type remains to be determined.

⁷⁹ In addition, Butler (2003) discusses the modal affixes *-laam* ‘may’ *-ñum* ‘must’ in Tamil. As indicated by Ophira Gamliel (pers. commun.), the situation is far more complex in Tamil and its relative Malayalam. First of all, Butler (2003) segments the affixes in a wrong way: The modal affix is *aam* rather than *laam*. Moreover, an epistemic interpretation only becomes available if other

3.6 Critical data

There are different types of examples that seem to contradict an approach that accounts for the ambiguity of modal operators in terms of event modification on the one hand, and propositional modification on the other hand. The next sections provide a couple of examples which are based on modal verbs.

3.6.1 Quantificational modal verbs

According to the analysis proposed above, circumstantial modal operators are event modifiers. This assumption is based on the observation that circumstantial modal verbs were not felicitous within the examples discussed so far. However, there are instances of modal verbs that select a predicate which refers to a state that cannot be changed and which clearly does not exhibit an epistemic interpretation, as in the examples provided by Brennan (1993: 96) in (615) and (616).

(615) A basketball player can be short.

(616) A basketball player will have good eyesight.

Beyond doubt, what is selected by *can* in the examples above is a predicate that denotes an essential property. Yet, the interpretation is by no means an epistemic one. However, these examples can only be interpreted in a circumstantial manner, as long as the subject NP is generic, such as an indefinite NP. As soon as the subject is replaced with a definite NP, only an epistemic interpretation will be available. As demonstrated by Maché (2009: 36), modal operators always seem to have to bind some variable, reminiscent of *Prohibition Against Vacuous Quantification*, as proposed by Kratzer (1995: 131). In the canonical case, a circumstantial modal operator binds the variable provided by the event argument of the embedded predicate. However, if the embedded predicate does not involve an event argument in the first place, two scenarios are possible. Either the clause contains another suitable variable such as an indefinite NP, or no such variable is present at all. In the first case, a circumstantial interpretation is still possible. The modal verb binds the variable provided by the indefinite NP obtaining a quantificational interpretation, in the same manner as those cases described in Section 3.3. In the second case, an epistemic reading obtains. This is typically the case with predicates that select a definite subject NP. This is how an epistemic interpretation can be main-

affixes are present, such as the concessive marker *-aalum*. Thus, it is not clear to what extent the epistemic interpretation is caused by the concessive marker.

tained, even if the embedded predicate does not contain an event argument, as in the case of stative predicates that denote essential states.

3.6.2 Intensional subjects

An epistemic interpretation becomes mandatory as soon as a modal operator embeds a proposition that does not contain any variable. As has been pointed out Section 3.4, this is most obviously exemplified in an environment in which a modal verb embeds a predication consisting of a predicate that refers to a state and a definite subject NP. However, there are some cases in German in which a circumstantial modal verb most readily occurs with such a predicate and a definite subject (cf. 617). An analogous example from English is given by Barbiers (2002: 61), who argues that a modal verb which selects an individual-level predicate can be interpreted in a circumstantial way whenever the reference of the subject NP is not identified (cf. 619).

- (617) Der Bewerber muss polnischer Muttersprachler sein.
 the applicant must Polish native.speaker be-INF
 ‘The applicant has to be a native speaker of Polish.’
- (618) Der Bewerber ist polnischer Muttersprachler.
 the applicant is Polish native.speaker
 ‘The applicant is a native speaker of Polish.’
- (619) The new professor must be a native speaker of English.

Note, however, that the definite subjects in the examples above behave in a peculiar way. Contrary to canonical definite subjects (cf. 618), those embedded under circumstantial modals do not refer to an identified referent. It is not even necessary for any such individual to exist in the actual world. Accordingly, the subjects exemplified in (617) and (619) behave like NPs in intensional contexts. By contrast, canonical definite subject NPs always refer to a given individual that is identified in the discourse (cf. 618). An intensional interpretation, in which the reference is not clearly determined or in which such a referent does not exist at all, is ruled out in these cases. The existence of the referent is presupposed with canonical definite subject NPs.

Again, it is plausible to assume that this type of intensional subject introduces some type of variable. Accordingly, a similar reasoning can apply to an intensional subject as exemplified with indefinite subject NPs: There is a further variable that can be bound by the modal operator. As a consequence, an epistemic interpretation can be avoided. It thus seems that a circumstantial interpretation is blocked

as soon as the modal operator modifies a predication consisting of a clearly identified individual and a predicate that refers to a state that cannot be changed.

3.6.3 Veronika Ehrich's counter example

There are further examples that seem to reject the analysis outlined above, which assumes that (i) circumstantial modal operators are event modifiers; (ii) circumstantial modal operators are not compatible with stative predicates that refer to states which cannot be changed, or to events in the past. As pointed out by Veronika Ehrich (pers. commun.), in some cases circumstantial modal verbs modify predications consisting of an identified individual and a predicate that refers to a state that cannot be changed (or individual-level predicate). Ehrich provided the following example, which undeniably exhibits a circumstantial interpretation.

- (620) Benedikt XVI muss fromm sein.
 Benedikt XVI must pious be-INF
 'Benedict has to be pious (behave in a pious way)'

At this point, the question arises what exactly can be considered an 'individual-level predicate'. As Kratzer (1995: 148), Jäger (2001) and Maienborn (2003: 216) point out, the borderline between individual-level predicates and stage-level predicates is rather blurry; there are certain mechanisms that can turn a stative predicate (lacking an event argument) into a stative predicate (carrying an event argument). In Kratzer's terms, an individual-level predicate can be changed into a stage-level predicate under particular conditions. In a more explicit manner, Maienborn (2003: 216) discusses two specific mechanisms by means of which a stative predicate that usually lacks an event argument can obtain one: The Temporariness Effect and the Agentivity Effect. Whereas the first causes a stative predicate to be interpreted as a temporally clearly bounded state, the latter provides an interpretation where the stative predicate is construed as an activity, like in agentive *be*-readings. These mechanisms of reinterpretation can be easily applied, as long as it is conceivable to dissociate the subject referent from the property expressed by the predicate. In the case of *pious*, it is possible to imagine that Benedikt XVI could give up his piety under certain conditions. Accordingly, an agentive *be*-interpretation is possible for the copula *sein* in example (620). However, the more tightly the property is associated with the subject referent, the less likely it becomes that these mechanisms of reinterpretation will succeed.

- (621) Benedikt XVI muss ein Deutscher sein.
 Benedikt XVI must a German be-INF

Intended reading: 'Benedict is obliged to be a German (behave like a German/become a German)' (circumstantial)

Preferred: 'Benedict must be a German (behave like a German/become a German)' (epistemic)

- (622) *Benedikt XVI muss ein Mann sein.*
Benedikt XVI must a man be-INF

Intended reading: 'Benedict is obliged to be a man (behave like a man/become a man)' (circumstantial)

Preferred: 'Benedict must be a man (behave like a man/become a man)' (epistemic)

- (623) *Benedikt XVI muss am 16. April 1927 geboren worden sein.*
Benedikt XVI must at 16 April 1927 born PAS.AUX.PST be-INF

Intended reading: 'Benedict is obliged to be born on the 16th April' (circumstantial)

Preferred: 'Benedict must be born on the 16th April' (epistemic)

Nationalities can be changed, though this is not very likely to happen. The sex of an individual is even less likely to change. Finally, the date of birth will always remain the same. Correspondingly, examples (621–623) decrease in their appropriateness for a circumstantial interpretation. Since the date of birth is a property that cannot be dissociated from the subject, the pattern in example (623) is restricted to an epistemic interpretation.

At this point, it becomes possible to provide a clearer definition of what is called 'individual-level predicate'. In fact, the term 'individual-level predicate' does not refer to a homogeneous class of stative predicates. Most predicates can be reinterpreted as elements that denote temporally bounded states or even activities. An ideal individual-level predicate expresses a property that cannot be dissociated from its subject referent. As it seems, there are very few predicates of this type. Nevertheless, it has turned out in this section that predicates that denote a property which cannot be dissociated from its subject referent are restricted to an epistemic interpretation if they are embedded by a modal operator.⁸⁰

Summing up, it has been demonstrated that all of the apparent counterexamples do not contradict the generalisations made in the previous sections. As a consequence, the analysis presented so far need not be revised.

⁸⁰ As Martin Schäfer (pers. commun.) has pointed out, there is an additional way to capture the distinction between stage-level predicate and individual-level predicates, in terms of agent control, based on theories put forth by Dik (1975) and Geuder (2006). It seems to be fruitful to pursue such an approach.

3.6.4 Summary

In this section, it has been shown that the ambiguity of modal operators and related phenomena can be explained in terms of event modification. It was demonstrated that epistemic modal operators can modify predications consisting of an identified individual and a predicate that refers to a state that cannot be changed, or a predicate that refers to some past event. In contrast, circumstantial modal verbs fail to embed such predications. As Kratzer (1995: 126) and Maienborn (2003: 106) have demonstrated, these predicates can most efficiently be described as predicates that lack an event argument. In other words, circumstantial modal operators are not compatible with predicates that lack an event argument; they are restricted to predicates that provide an event argument. These facts could be an indication that circumstantial modal verbs are event modifiers. A similar observation has been made by Colomo (2011: 63, 66).

This analysis is corroborated by data from several languages. Moreover, it gets additional support from the behaviour of related types of ambiguous modifiers. In the preceding sections, it has been demonstrated that certain modifiers, such as causal clauses, conditional clauses, temporal clauses, manner adverbs, locative adverbials and others, impose selectional restrictions in their canonical interpretations with regard to the event provided by the modified predicate. The type of restriction may differ and can concern the temporal situation of the events as well as the involvement of an agent who is in intentional control of the event. However, they can alternatively be used to modify propositions or speech acts. In this interpretation, the selectional restrictions are no longer active.

Generally speaking, modal verbs and a group of related modifiers are ambiguous between two interpretations. In their canonical, non-epistemic interpretation, they are event modifiers which impose selectional restrictions on the specification of the event provided by the matrix predicate. In contrast, they modify more complex entities in their non-canonical or epistemic interpretation. In this interpretation, the selectional restrictions regarding the event type are dropped. At this point, the precise nature of the modified entity remains unclear. There is evidence suggesting that the non-canonical interpretations modify propositions, and there is evidence that they are speech acts. Section 4 contains an attempt to shed light on this issue. It deals with the environments from which epistemic operators are excluded.

Finally, this section has not addressed the question of whether a distinction between an ‘objective’ and ‘subjective’ epistemic interpretations should be made. The advantages and disadvantages of such a distinction will be carefully considered in Section 4.

4 Twenty-one commandments for epistemic modality

After having discussed environments in which circumstantial modal verbs are ruled out and only epistemic modal verbs are possible, this section is dedicated to contexts from which epistemic modal verbs are said to be excluded. In the past decades, a lot of contexts have been suggested that are supposedly incompatible with epistemic modal verbs. However, most of them have never been checked against broad empirical data. Thus, the empirical status of these claims is rather unclear. The main contribution of this chapter is to provide a thorough investigation of the twenty-one most discussed environments where epistemic modal verbs are claimed to be ruled out. Based on German data from the DeReKo corpus, a major aspect of this investigation will be to carefully check to what extent epistemic modal verbs really do not occur in these environments.

Why do these non-canonical environments play such an important role in a discussion of the nature of epistemic modification? Considering these configurations, the question arises why an epistemic modal verb cannot be interpreted in a particular environment. If one compares such non-canonical environments with environments in which the relevant epistemic modal verb canonically occurs, one might find an essential difference between the two environments. This “difference” can be some operator or element that takes scope over the epistemic modal verb. If the unacceptability of the epistemic modal verb correlates with the presence of that operator, further conclusions can be made concerning the precise position or function of epistemic modifiers in the architecture of the utterance.

An essential question that arises at this point concerns the precise position of epistemic operators with respect to the proposition: Are epistemic modifiers part of the proposition, or do they occupy a position external to the proposition? Lyons (1977: 799) assumes that epistemic modal verbs are external to the proposition, as he considers that epistemically modified utterances are not acts of telling, and that they involve an illocutionary force similar to that of questions. As Lyons (1977: 799, 804, 805) acknowledges, epistemic modal verbs sometimes occur in environments which cannot occur outside of the proposition. As a consequence, Lyons (1977: 803) differentiates between two types of epistemic modifiers: ‘subjective’ and ‘objective’ epistemic modal operators. While the first type is external to the proposition, the latter type is part of the proposition. From his assumptions it follows that subjective epistemic operators should compete for the same structural position in the clausal hierarchy as illocutionary force operators, such as assertion operators, question operators, or imperative operators.

<https://doi.org/10.1515/9783110411027-004>

Likewise, Kiefer (1984: 72) concludes that ‘subjective’ epistemic modal verbs, being attitudinal operators, are external to the proposition, whereas ‘objective’ epistemic modal verbs are part of the proposition. Analogously, Huitink (2008: 10) assumes that ‘subjective’ epistemic operators are speech act modifiers, as they do not contribute to the truth conditions of a sentence. Furthermore, she concludes that ‘objective’ epistemic modal verbs form part of the propositional content. In a similar vein, Drubig (2001: 14) argues that epistemic modal operators are subject to the non-assertive restriction: He takes it that they are interpreted outside of the proposition at LF. Since speech act operators only affect the proposition, Drubig (2001) expects epistemic modal verbs to never occur in the scope of a question operator or directive operator. Cohen (2010) takes a similar perspective.

In contrast to these points of view, there are authors who assume that epistemic modal verbs are always part of the proposition, regardless of whether they are considered ‘subjective’ or ‘objective’. As Papafragou (2006: 1693) demonstrates, ‘subjective’ epistemic modal verbs contribute to the truth conditions. They should, thus, be part of the proposition. Moreover, she shows that they occur in environments in which they are in the scope of modifiers that are part of the proposition. In a similar vein, Zimmermann (2004: 263) concludes that epistemic *müssen* is part of the proposition, as it can occur in the scope of negation. A similar observation has been made by Krämer (2005: 49) for German *müssen* and *können*.

Another question that comes up in this discussion concerns the syntactic category of epistemic modal verbs. Some authors, such as Abraham (2001: 21), Wurmbrand (2001: 184) and Erb (2001: 102), argue that epistemic modal verbs in German do not occur in non-finite environments. Based on this assumption, they conclude that they differ in crucial aspects from canonical lexical verbs, and that they must be functional elements rather than lexical verbs.

This chapter will discuss a comprehensive corpus based survey of the twenty-one environments from which epistemic modal verbs have been claimed to be excluded. As it turns out, most of these environments do host epistemic modal verbs. The only configurations in which epistemic modal operators actually seem to be ruled out involve (i) directional phrase complements, (ii) *wh*-clefts, (iii) nominalisations, (iv) adverbial infinitives, and (v) modal verbs that are embedded under a volitional modal operator, such as circumstantial modal verbs, predicates of desire, imperatives and optatives. Moreover, event-related conditionals and temporal *wenn*-clauses appear to be further promising candidates that do not tolerate epistemic modal operators. These conclusions are very similar to the ones arrived at by Eide (2005: 9).

What consequences do these results imply? First of all, the fact has to be accounted for that epistemic modal verbs are not compatible with these four envir-

oments, and that they are only acceptable under particular conditions in the remaining environments. It is not obvious that the difference in acceptability is caused by the same criterion in each of the environments reviewed here. As will be shown, the most adequate explanation is based on the conditions of how the epistemic operator is anchored. Epistemic operators always need to be evaluated with respect to a clearly identified attitude holder. In the most canonical case, this attitude holder is identical to the speaker of the actual utterance. As will be shown in Sections 4.1, 4.11, 4.12 and 4.15, there are cases in which a context shift applies and, as a consequence, the attitude holder is anchored to a referent distinct from the speaker. Accordingly, it is more efficient to identify the attitude holder with a more abstract concept such as the deictic centre, which has originally been introduced by Fillmore (1997: 98) in the early seventies and which was subsequently developed in more detail by Levinson (1983: 64). It is reminiscent of the Origo as conceived by Bühler (1934: 102).

Based on these assumptions, it is plausible to assume that epistemic operators introduce a variable for the deictic centre which remains to be instantiated. It is the aim of the present study to investigate the precise mechanisms of this anchoring. As it seems, the variable for the deictic centre has to be anchored to the most local appropriate epistemic agent. When there is an intervening operator, the configuration can become uninterpretable. Environments (i) and (ii) seem to violate the selectional restrictions imposed by the epistemic operator.

Furthermore, it will be demonstrated that any approach which regards epistemic modal verbs as distinct functional categories faces serious challenges: This type of approach will have to account for the fact that epistemic modal verbs in languages such as German behave, in many respects, more like lexical verbs than may be expected at first glance.

Likewise, it turns out that the distinction between ‘objective’ and a ‘subjective’ epistemic modality is misleading, as it creates more problems than it solves. First of all, the examples that are considered as including ‘objective’ epistemic modal verbs do not constitute a homogenous class. Quite a lot of the essential characteristics that have been proposed only hold for single epistemic modal verbs, rather than for all of the verbs that are regarded as ‘objective’ epistemic: There are only two epistemic modal verbs that are attested in the scope of a quantifying expression such as *jeder* ‘every, any’: The possibility modal verbs *können* and *könnte*. The only epistemic modal verbs that occur in *wh*-questions are *könnte*, *dürfte* and *kann*, and a negation can only take scope over epistemic *können* and *müssen* without any restriction. Secondly, most of the ‘objective’ epistemic modal verbs turn out to involve no epistemicity at all and can more efficiently be captured as instances of practical possibility, practical necessity or quantificational modal verbs. Thirdly, the remaining ‘objective’ epistemic modal verbs are evaluated with

respect to a clearly determined deictic centre and behave exactly like ‘subject’ epistemic modal verbs do. Thus, there is no reason to regard these remaining cases as a distinct category.

Finally, the question of whether epistemic operators are internal or external to the proposition will not be fully solved here. Much of the data presented in this section rather seems to speak in favour of an account suggesting that epistemic operators are part of the proposition, supporting the analysis proposed by Papafragou (2006: 1693): They occur in the scope of negation and in adverbial clauses. In a similar fashion, Krämer (2005: 49) argues that the epistemic modal verbs *können* and *müssen* have to be part of the proposition, as they can occur in the scope of negation, or of a question, and they can carry verum focus. Based on their corpus study, Hacquard and Wellwood (2012: 2–4) arrive at similar conclusions. The ability of epistemic operators to occur embedded under these operators seems to point in the direction of an analysis which treats them as truth conditional, and hence, as a part of the proposition. However, epistemic modal verbs appear to interact with elements that are external to the proposition. In particular, they occur in polarity and *wh*-questions that yield the same interpretation as questions containing the epistemic particle *wohl*. As Zimmermann (2004: 263) argues, the epistemic operator contributed by *wohl* cannot be a part of the proposition in these questions. Being an operator that determines the speaker’s (or the hearer’s) commitment to the proposition, a Hamblin-Style analysis of questions would only yield the correct interpretation if the operator was outside of the proposition. In short, the situation remains paradoxical: epistemic modifiers seem to form part of the proposition, and to be truth functional, while at the same time they can interact with speech act operators. In order to solve this issue, it is not only necessary to develop an analysis for epistemic operators but also to provide an elaborate perspective on speech act and illocutionary operators. As has been noticed on various occasions, an utterance can involve more than one of these operators. Zimmermann (2004: 273) shows that an ASSERT and a ‘?’ operator can take scope over an operator that determines the propositional commitment of the speaker or the hearer. In a similar fashion, Reis (2003: 192) considers approaches plausible that derive the interpretation of German *wh*-root-infinitives from their directive counterparts. Pursuing this reasoning would result in a configuration in which a *wh*-operator takes scope over a directive speech act, hence a configuration that involves more than one illocutionary operator.

The corpus study presented in the upcoming sections is based on the DeReKo corpus for German. It was carried out in 2011, at a time when the corpus encompassed by and large 2 billions of word form tokens. Occasionally, the corpus data will be supplemented by examples from other sources. As this study was focused on epistemic modal verbs, the following items were taken into consideration:

kann, könnte, muss, müsste, dürfte, sollte, mag, wird and *braucht*. Since the latter is a negative polarity item and only occurs in contexts with negation – an additional logical operator that can cause complications – it has not been considered in all of the investigations. Moreover, it was already demonstrated in Section 2.2.9 that its epistemic uses are almost absent from the corpus.

4.1 No infinitives

Askedal (1997: 13, 1998: 60), Zifonun (1997: 1268), Wurmbrand (2001: 184) and Abraham (2001: 21, 2002: 27, 2005: 246) argue that in German the epistemic uses of the six traditional modal verbs, which are genuine auxiliaries, lack infinitive forms, cf. the example given by Zifonun.

- (624) Er wird nicht mehr ganz nüchtern sein können
 he FUT.AUX NEG more entirely sober be-INF can-INF
 # Epistemic: ‘He will possibly not have been entirely sober anymore.’

Erb (2001: 103) stresses that the lack of infinitive epistemic modal verbs seems to be a peculiarity of German, since in other languages such as Dutch and Danish, they exist, as has been pointed out by Thráinsson and Vikner (1995: 76).¹ In a similar fashion, Eide (2005: 393) provides examples of epistemic modal verbs in Norwegian being embedded as an infinitive complement (*måtte* ‘must’, *kunne* ‘may’, *burde* ‘ought-to’ and *ville* ‘will’), as shown in examples (625)–(626).²

- (625) Dette antas å måtte være en misforståelse.
 this suppose-PASS to must-INF be-INF a misconception
 ‘One supposes that this certainly is a misconception.’
- (626) Denne tabben fryktes å kunne ha kostet dem
 this mistake fear-PASS to may-INF have-INF cost-POP them
 oppdraget.
 job.the
 ‘One fears that this mistake possibly made them lose the job.’

² According to the view entertained here, it is far from evident whether the alleged examples with non-finite epistemic modal verbs indeed involve epistemicity. Thráinsson and Vikner (1995) wonder why *kunne* is the only epistemic modal verb in Danish that can be embedded. As has been shown above, in the case of German *können* it is almost impossible to decide whether it is interpreted as a practical or as an epistemic possibility. Hence, the use of *kunne* under discussion could equally be interpreted as a practical possibility reading or quantification over events.

According to Erb's claim, it should be impossible to embed epistemic modal verbs in non-finite environments in German. Yet, even in German, infinitives of epistemic modal verbs are attested in corpora, at least in the case of *können* (cf. 627–629) and *müssen* (cf. 630). This indicates that examples like the one in (631), constructed by Reis (2001: 295), do indeed occur naturally. The remaining modal verbs could not be found for various reasons. First of all, *dürfen* and *sollen* can be construed in an epistemic manner in their subjunctive past forms. Since infinitives in German cannot be specified for mood, they do not fulfil the prerequisite for an epistemic interpretation for *dürfen* and *sollen*. Secondly, *werden* does not involve non-finite forms in its use as a future auxiliary from which the epistemic interpretation is derived. Finally, epistemic *mögen* could not be found at all as a part of a *zu*-infinitive complement in the DeReKo corpus, which might be due to its generally low frequency and archaic nature.³

- (627) Sie stehen nun unter Verdacht, das Feuer selbst gelegt haben
they stand now under suspicion the fire self set-PPP have-INF
zu können.⁴
to can-INF

'They are suspected to have (possibly) set the fire themselves.'

- (628) einer der Hauptverdächtigen in der weltweiten Suche nach
on the-GEN primary.suspects-GEN in the world.wide search for
den Urhebern des „ILOVEYOU“- Computervirus hat
the authors the-GEN ILOVEYOU computer.virus has
eingedrückt, die verheerende E-Mail möglicherweise
conceded the devastating email possibly
„versehentlich“ gesendet haben zu können.⁵
accidentally send-PPP have-INF to can-INF

'One of the primary suspects in the world-wide search for the authors of the ILOVEYOU computer virus has conceded that he could possibly have sent the devastating e-mail by accident.'

³ The underlying query was *haben zu mögen* and *sein zu mögen*. Since epistemic modal verbs predominantly occur with stative complements, it is expected that potential epistemic instances of *mögen* should be very likely to occur with one of these highly frequent stative predicates as well. In a similar spirit, Raynaud (1977: 22) has found that in her corpus 90 % of the epistemic modal verbs selected the stative verb *sein* as its complement. However, in those cases where it does not, it is very doubtful whether *mögen* can be documented in such contexts at all.

⁴ DeReKo: BRZ09/OKT.10939 Braunschweiger Zeitung, 24/10/2009.

⁵ DeReKo: K00/MAI.37742 Kleine Zeitung, 12/05/2000.

- (629) Er befürchtet zugleich, Vater werden und sich mit Aids
 He worries at.the.same.time father become and self with AIDS
 infiziert haben zu können.⁶
 infect-PPP have-INF to can-INF
 'He is worried that he may become a father and that he may have contracted AIDS at
 the same time.'
- (630) Die einzige englischsprachige Krankenschwester meinte immer
 the only English-speaking nurse remarked always
 wieder, mich falsch verstanden haben zu müssen.⁷
 again me wrong understand-PPP have-INF to must-INF
 'The only English nurse remarked over and over that she must have got me wrong.'
- (631) Der Verdacht, sich täuschen zu müssen, drängte sich mir auf.
 the suspicion REFL err-INF to must-INF impose REFL me on
 'The suspicion that I must have been wrong became obvious to me.'

Crucially, all of these examples involve a context shift. Whereas in the most frequent cases the epistemic modal verb is evaluated with respect to the speaker, this does not hold for the examples above. Therefore, it becomes necessary to differentiate between the speaker referent and the referent who undertakes the evaluation. For the sake of clarity, the latter will be referred to as the 'deictic centre' in the following. This is on par with Abraham (2005: 263), who argues for the need to syntactically represent the modal source as being a part of the argument structure of epistemic and circumstantial modal verbs. As the examples above indicate, epistemic modal verbs can occur in non-finite environments if they are embedded by a predicate that expresses an attitude. Crucially, these predicates introduce an argument that is specified as the attitude holder. In all of the instances of non-finite epistemic modal verbs considered so far, the deictic centre is anchored to that argument which is specified as the attitude holder or epistemic agent. Accordingly, the deictic centre is identified with the subject referent in examples (628), (629) and (630), or the unexpressed argument of the noun *Verdacht* 'suspicion' in examples (627) and (631). As will be demonstrated in great detail in Section 4.15, epistemic modal verbs that are embedded in finite complement clauses, under non-factive predicates, behave in an analogous manner.

As Reis (2001: 296) stresses, instances such as example (631) do indeed involve a 'subjective' epistemic interpretation, rather than an alethic or 'objective' epistemic one, because they clearly specify a deictic centre: the matrix subject, cf. Mortelmans, Boye and Auwera (2009: 34) for a similar conclusion.

⁶ DeReKo: RHZ07/JAN.21226 Rhein-Zeitung, 24/01/2007.

⁷ DeReKo: HAZ07/NOV.04660 Hannoversche Allgemeine, 17/11/2007.

As a consequence, epistemic modal verbs only occur in non-finite environments if they are embedded under a predicate that expresses an attitude and syntactically specifies an argument as the holder of the relevant attitude. Otherwise, the identification of the deictic centre fails. As expected, no instances could be found in adverbial infinitives that are headed by *um zu*, *ohne zu* or *anstatt zu*. These contexts do not specify a holder of an attitude. This is why the CoDeC as stated in Section 2.1.3.3 needs to be (re)formulated with respect to the deictic centre, rather than the speaker: An epistemic operator that occurs embedded under particular predicates can be evaluated with respect to an appropriate referent other than the speaker.

However, there are occurrences of non-finite modal verbs that are not embedded by attitude predicates and nonetheless involve an interpretation that could be epistemic. In example (632), *müssen* is embedded by the future auxiliary *werden*. Since it is a subject-to-subject raising verb, no context shift is induced here.

- (632) sie werden ihn in Leipzig oft genug müssen gesehen haben,
 they will him in Leipzig often enough must-INF see-PPP INF
 den bösen buben⁸
 the bad boy
 ‘They must have had to see him often enough in Leipzig, the brat.’

Even if the modal verb embeds a infinitive complement that refers to a past event, it is not evident that this instance indeed has to be interpreted epistemically. Alternatively, it is conceivable here that *müssen* expresses the physical necessity that nobody could escape from seeing the brat, as shown in the gloss given below.⁹ If this is indeed the appropriate interpretation, it remains mysterious why *müssen* takes scope over the perfect auxiliary *haben*.

Some authors, e.g. Cinque (1999: 87), Eide (2005: 9) and Colomo (2011: 111), argue that epistemic modal verbs cannot be embedded under circumstantial modal verbs. This observation can be derived from the conditions on embedding of non-finite epistemic modal verbs. As has been demonstrated above, epistemic modal verbs can occur in non-finite contexts, but they are subject to severe restrictions. Since they introduce a variable for a deictic centre, this variable needs to be instantiated. In order to be successfully anchored, a deictic centre requires an attitude holder who is syntactically realised in the local environment, for instance as an argument of the embedding attitude verb. If no such argument is present, the instantiation fails. As it seems, circumstantial modal verbs do not introduce

⁸ Jakob Michael Reinhold Lenz, *Der Hofmeister*, V.7 (1774).

an appropriate argument that could be identified with the deictic centre. Thus, no interpretation can be obtained.

4.2 No past participle

Furthermore, it has been argued that, due to their auxiliary-like nature, epistemic modal verbs lack independent past participles, by Griesbach and Schulz (1976: 84), Zifonun (1997: 1269), Askedal (1997b: 13), Erb (2001: 103), Abraham (2001: 13, 2002: 27, 2005: 246), Helbig and Buscha (2001: 121) and Wurmbrand (2001: 184). In a similar fashion, Fagan (2001: 200) argues that modal verbs which are embedded by the perfect tense auxiliary *haben* cannot be interpreted in an epistemic manner. As already shown in Section 2.1.1.2, the past participles of the six traditional modal auxiliaries are usually realised as IPP. According to the relevant authors, these can only be circumstantially interpreted, as is illustrated in the example given by Zifonun.¹⁰

- (633) Er hat/hatte nicht mehr ganz nüchtern sein
 He PRF.AUX/PRF.AUX.PST NEG more entirely sober be-INF
 können.
 can-PPP(ipp)
 # Epistemic: ‘He cannot have been entirely sober anymore’

However, there are different environments in which past participles of epistemic modal verbs can neatly be employed. In particular, this concerns modal verbs that are embedded by the perfect auxiliary *haben* being marked for the past subjunctive. As has been illustrated by Kasper (1987: 26), in German the use of the subjunctive of the past in declarative root clauses signals that the speaker is not in a position to felicitously assert the truth of the proposition. Roughly speaking, it indicates counterfactuality. A similar perspective is taken by Eisenberg (2004: 117) and Eisenberg et al. (2005: 523). In contrast, the past subjunctive can serve as an optional marker of indirect speech in complements of non-factive predicates, as

⁹ This interpretation of *müssen* can be found in examples such as the one below, which is clearly circumstantial:

- (1) Fast neun Jahre habt ihr mich ertragen müssen.
 almost nine years have you me endure-INF must-PPP(ipp)
 ‘You had to endure me for nine years.’

DeReKo: NON09/SEP.15338 Niederösterreichische Nachrichten, 23/09/2009.

is illustrated in Eisenberg et al. (2005: 538) and Eisenberg (2004: 120). Whenever it is embedded by the perfect auxiliary *haben* with past subjunctive morphology that indicates indirect speech, an epistemic interpretation is straightforward (cf. 634):

- (634) Der Angeklagte wartete vor dem Altenkirchener
 the accused waited in.front.of the Altenkirchen-ADJ
 Amtsgericht schnell mit einer Gegenthese auf, nach
 local.court quickly with a counter.assumption after which
 welcher einer der Streithähne ebenfalls die Wagen hätte
 one of the wranglers also the car have-SBJ.PST
 beschädigt haben können.¹¹
 damage-PPP have-INF can-PPP(ipp)

‘In the Local Court of Altenkirchen, the accused quickly came up with an alternative explanation according to which one of the wranglers could also have damaged the car.’

Again, this example involves a context shift: The deictic centre is not the speaker but the subject referent of the matrix clause. Reis (2001: 295) demonstrates that for the past participles of *können* and *müssen* epistemic interpretations are moreover possible in counterfactual/irrealis conditional contexts as well, (cf. 635 and 636). As examples (637–640) illustrate, these patterns are also attested in corpora. However, Erb (2001: 104) assumes that the epistemicity is contributed by the subjunctive marking on the perfect auxiliary *haben* (*hätte*).

- (635) Nach allem, was ich weiß, hätte er da noch in
 According everything that I know have-SBJV.PST he there still in
 Prag sein können.
 Prague be can-PPP(ipp)

‘As far as I know, he could still have been in Prague.’

- (636) Nach allem, was ich weiß, hätte er dann zu
 According everything that I know have-SBJV.PST he then at
 Hause sein müssen.
 home be-INF must-PPP(ipp)

‘As far as I know, he must have been at home in that case.’

- (637) Die Indizien liessen keinen zweifelsfreien Schluss auf die
 the evidence let no doubt.less conclusion about the
 Täterschaft zu; es hätte durchaus auch jemand
 delinquent to it have-SBJV.PST thoroughly also somebody

¹¹ DeReKo: RHZ07/NOV.21178 Rhein-Zeitung, 22/11/2007.

völlig anders die tödlichen Schüsse abgegeben haben
 completely else the lethal bullets shot-PPP have-INF
 können¹²
 can-PPP(ipp)

‘There was no compelling evidence about the delinquent, somebody completely different may have shot the lethal bullets.’

- (638) Wie der Polizist sagte, hätten die Spuren – wenn die
 as the policeman said have-SBJV.PST the traces if the
 Angaben des jungen Mannes stimmen sollten – nach
 information the-GEN young-GEN man-GEN hold should after
 dem Regen am Abend verwischt sein müssen.¹³
 the rain on.the evening cover-PPP be-INF must-PPP(ipp)

‘As the policeman said, the tracks should have been covered by the rain that came down on the other evening if the information provided by that young man was indeed right.’

- (639) Ein Schweizer Gerichtsmediziner kam zum Schluss, dass das
 A Swiss forensic.doctor came to.the conclusion that the
 Opfer bei einem so hohen Alkoholpegel bewusstlos
 victim at a such high alcohol.level unconscious
 hätte sein müssen.¹⁴
 have-SBJV.PST be-INF must-PPP(ipp)

‘A Swiss forensic doctor came to the conclusion that the victim should have lost consciousness from having such a high alcohol level.’

- (640) Wäre es ein Meteor gewesen, dann hätte er von
 be-SBJV.PST it a meteor be-PPP then have-SBJV.PST he by
 Überschallknall und Druckwellen begleitet sein
 supersonics and blast.waves accompany-PPP be-INF
 müssen, die im weiten Umkreis Fenster zerbrochen
 must-PPP(ipp) REL.PRN in.the wide radius windows smash-PPP
 hätten.¹⁵
 have-SBJV.PST

‘If it had been a meteor it should have been accompanied by supersonics and blast waves that would have broken the windows within a considerable radius’

Similar examples have been discussed by Jędrzejowski (2010: 44). As illustrated by Reis (2001: 296), these examples indeed involve ‘subjective’ epistemic modal-

12 DeReKo: SOZ06/SEP.03999 Die Südostschweiz, 20/09/2006.

13 DeReKo: RHZ09/JAN.18631 Rhein-Zeitung, 26/01/2009.

14 DeReKo: A10/JAN.06246 St. Galler Tagblatt, 26/01/2010.

15 DeReKo: SPK/J98.00108 spektrumdirekt, 01/03/1998.

ity, rather than alethic or objective epistemic modality, since there is a clearly defined deictic centre, which is instantiated by the matrix subject referent or the speaker in most of the cases above, as is shown in examples (637) and (640). At this point, the question arises what precisely it is that the counterfactual operator affects. What is marked as unrealis or counterfactual in examples (635)–(640) is the epistemic commitment: If some particular conditions were fulfilled, the speaker would consider it possible or necessary that the state of affairs expressed by the proposition holds. Arguably, the speaker signals in these examples that the modal base, which corresponds to his knowledge, does not contain a particular set of propositions under discussion in the current discourse. But if his modal base comprised them, he would come to the conclusion expressed by the epistemic modal verb. If the young man's information in example (638) were indeed part of the policeman's knowledge and beliefs, he would conclude that they must have been covered by the rain. That the subjunctive operator interacts with the discourse structure has already been illustrated by Kasper (1987: 24–28).

Eide (2005: 395) provides similar examples for the Norwegian epistemic modal verbs *måtte* 'must' (cf. 641) and *kunne* 'may' (cf. 642), being embedded as past participles in counterfactual environments. Likewise, Barbiers (1995: 198, Fn. 42) discusses an epistemic instance of Dutch *moeten* with IPP morphology.

- (641) Dersom tyngdekraften ikke fantes, hade det måttet være
if gravity-DEF NEG existed had it must-PPP be-INF
vanskelig å holde beina på jorda!
hard to keep-INF legs-DEF on ground-DEF
'If gravity had not existed, it would have to be difficult to stay grounded.'

- (642) Hvis jeg hadde kunnet være morderen, herr Holmes, hadde
if I had can-PPP be-INF killer-DEF Mr. Holmes had
politiet arrestert meg for lenge siden.
police-DEF arrest-PPP me for long since
'If I could possibly be the killer, Mr. Holmes, the police would have arrested me long ago.'

It is fairly doubtful that it is possible in Contemporary German to embed epistemic *können* under a perfect auxiliary that is inflected for indicative mood. Interestingly, this pattern exists in a typological perspective. Such patterns are the unmarked ways of expressing assumptions about some past event in French and Spanish, as is shown by Demirdache and Uribe-Etxebarria (2008: 1809) and Hacquard (2006: 25, 44, 155). The most intriguing aspect of this phenomenon is that these patterns involve an inverse scope of tense operator and modal operator, as illustrated in the examples given by Hacquard (2006: 25, 44) (643)–(644) and Demirdache and Uribe-Etxebarria (2008: 1809) (645):

- (643) Bingley a pu parler à Jane.
 Bingley has can-PPP speak-INF to Jane
 ‘Given J.’s circumstances then, she managed to speak to Jane.’ (circumstantial)
 ‘Given my evidence now, it could be the case that Bingley did then speak to Jane.’
 (epistemic)
- (644) Jane a dû prendre le train.
 Jane has must-PPP take-INF the train
 ‘Given J.’s circumstances then, she had to take the train then.’ (circumstantial)
 ‘Given my evidence now, it must be the case that Jane did then take the train.’ (epi-
 stemic)
- (645) Pedro ha debido ganar la carrera.
 Pedro has must-PPP win-INF the race
 ‘Pedro must have won the race.’ (epistemic)

It deserves closer attention that this pattern was possible in earlier stages of German as well. Example (646) is taken from the play *Agrippina* written by the Silesian playwright Daniel Casper von Lohenstein.¹⁶ In an argument with her son, Agrippina wonders how she could have given birth to a child that is so unlike her.

- (646) Ein Tiger hat mit mir sich muessen gatten // Daß
 a tiger has with me himself must-PPP(ipp) copulate-INF that
 dieser Leib solch einen Wurm gebahr.¹⁷
 this body such a worm bore
 ‘A tiger must have mated with me as this body has given birth to such a worm.’

Similar patterns can be found with *brauchen* up to the late 19th century. Interestingly, *brauchen* is not morphologically realised as IPP in these examples, but rather as a *ge*-participle.

- (647) Es läßt sich als ausgemacht annehmen, daß die edleren
 it let REFL as agreed assume-INF that the precious
 Obstsorten, welche niemals wild wachsend gefunden, sondern
 fruits which never wild growing found but
 allezeit unter menschlicher Wartung und Pflege erzeugt werden
 always under human attention and care produced are
 von einer gemeinen und wilden Mutter herkommen, welche
 from a common and feral mother stem which

¹⁶ The rather unexpected alignment of the epistemic modal verb and its complement could be due reasons of meter and rhyme.

¹⁷ Daniel Casper von Lohenstein, *Agrippina*, V, 403. (1666).

nachmals durch die Länge der Zeit, mit Hülfe
 later through the length the-GEN time-GEN with help
 menschlichen Nachdenkens, Kunst und Fleißes, ihre Zucht
 human-GEN reasoning-GEN, art-GEN and effort-GEN their growth
 veredelt und an Figur, Farbe, Geschmack, Geruch und Größe
 cultivated and on shape colour taste smell and size
 verändert hat. Dieser Mutterbaum, obgleich wild, hat doch, wenn
 changed has this mother.tree, even.if feral has yet if
 er unter einem milden Luftstriche stand, nicht so herbe und
 he under a mild air.flow stood NEG so harsh and
 widrig zu seyn gebraucht, wie die Aepfel, welche unsre
 contrarious to be-INF need-PPP(ge) as the apples which our
 nordischen Waelder erzeugen.¹⁸
 Nordic forests produce

'It is commonly assumed that the fruit trees which have never been found feral in nature but which were always produced under human attention and care originate from a common and feral mother. Consecutively, they were cultivated and their growth was supported by human reasoning, art and effort. Thus, they changed their shape, colour, taste, smell and size. This mother tree does not need to have been as harsh and contrarious as the apples that grow in our Nordic forests.'

- (648) Aber es wird nun ein Mahl als ausgemacht angenommen, das
 But it PASS.AUX now a time as agreed assumed the
 Ganze, woraus die sogenannten Fragmente sind,
 ensemble where.from the so-called fragments are
 habe nur ein einziges Buch betragen, und zwar
 have-SBJV.PRS only a single book amount and indeed
 habe es kein Größeres zu seyn gebraucht, als das
 have-SBJV.PRS it no bigger to INF need-PPP(ge) as the
 zweyte Buch von Gajus.¹⁹
 second book by Gajus

'It is taken to be granted that the ensemble from which the so-called fragments originate only made up a single book and it does not need to have been more voluminous than Gajus' second book.'

Even if this pattern was grammatical in earlier stages of German, this does not entail that it should be regarded as grammatical for Contemporary German. Rather,

¹⁸ Peter Jonas Bergius *Von Obstgärten und deren Beförderung in Schweden* Leipzig: Gräffische Buchhandlung, p. 40, (1794).

¹⁹ Gustav Hugo *Beyträge zur civilistischen Bücherkenntnis der letzten vierzig Jahre* Berlin: August Mylius, p. 646, (1829).

examples (646)–(648) are hardly acceptable for any native speaker of present-day German.

4.3 No past tense

In her corpus based study, Coates (1983: 241) demonstrated that English modal auxiliaries with epistemic interpretations never occur in the scope of a past tense operator. In a similar vein, Hengeveld (1988: 237), based on observations from Spanish, assumes that ‘subjective’ epistemic modal verbs are bound to the moment of speaking and thus excluded from any past context. For German, Zifonun (1997: 1269), Axel (2001: 45), Reis (2001: 291), Erb (2001: 98) and Colomo (2011: 111) hold the view that epistemic modal verbs are incompatible with ‘referential’ past tense, cf. the examples given by Erb (2001).

- (649) Sie mußte also zu Hause sein.
she must-PST therefore at home be-INF
‘# Epistemic: ‘(I assumed then that) It was necessarily the case that she was at home.’
- (650) Da wußte sie, daß ihre Mitbewohner im Theater sein
then know-PST she that their roommates in.the theatre be-INF
mußten.
must-PST
‘Then she knew that her roommates must have been in the theatre.’

As these authors stress, under specific conditions, utterances like the one in example (649) can have an epistemic interpretation. In these cases, however, the past tense morpheme is not interpreted as referential tense. Erb (2001: 101, 118, 122) argues that these epistemic modal verbs with past morphology do not qualify the epistemic state of the speaker but that of the matrix subject, or even some third, pragmatically salient party. A similar observation has been made by Diewald (1999: 263 Fn. 13). Again, these patterns involve a specific type of context shift. In particular, they involve a deictic centre that has made some epistemic judgement in the past, as is illustrated in example (650) in more detail.

In order to better understand the interaction of time and modality, it is fruitful to consider the model of temporal interpretation suggested by Klein (1994: 3). According to his perspective, each utterance involves three types of time intervals: The Time of Utterance, which is the time interval when the speaker performs the speech act; the Topic Time, which encompasses the time interval the speaker talks about (past/present/future); and the Time of Situation, which corresponds to the time interval during which the situation happens. Arguably, epistemic operators introduce a fourth time interval: The Time of Evaluation, which corresponds to

the time interval in which the deictic centre evaluates the proposition with respect to his knowledge. Similar considerations have been made by Homer (2010: Sect. 2.1) and Martin (2011: Sect. 1). In the canonical case, the Time of Evaluation coincides with the Time of Utterance. The Time of Evaluation is closely linked to the speech act event (event of evaluation), as has been shown by Hacquard (2006: 138, 2010: 152). According to her, epistemic operators are oriented towards the speech act event of the utterance.

The past operator can in principle affect two intervals: either the Topic Time, the time interval that is talked about resulting in a past event reading, or the Time of Evaluation, yielding a past speech act event reading. The latter type of interpretation is the one typically found in indirect reported speech. It often additionally involves the shift of the deictic centre to a salient third party. What Erb (2001) regards as the referential past tense of an epistemic modal verb obviously corresponds to the past event reading.

The past speech act event reading is reminiscent of the behaviour of reportative modal verbs in past tense contexts. One could argue that epistemic modal verbs turn into reportative modal verbs or something related whenever they are interpreted in that manner. A unified analysis is suggested in Section 5.1.5.

Returning to *können*, a small corpus study revealed that the past event reading indeed hardly occurs in German.²⁰ As has been illustrated by Heine (1995: 23), some contexts strongly favour an epistemic interpretation, such as the selection of perfect infinitive complements. If the past event reading does indeed exist, it is expected to behave like any other canonical epistemic modal verb, thus frequently embedding perfect infinitives. In a search for cases of *können* with a past inflection that select perfect infinitive complements, 70 occurrences could be found. Interestingly, the overwhelming majority of these examples involves a negation or some other negative polarity contexts, specifically, 65 occurrences. This type of pattern is illustrated in example (651). Among the remaining examples, one is a clear case of context shift, in which *können* is embedded by a verb of saying (*denken* ‘think’). As for the other one, no other reading seems to be plausible than a past event reading, as indicated in example (652). Even if the context contributes another plausible agent, the deictic centre of the epistemic judgement made in this clause is the speaker.

20 DeReKo corpus study conducted on February 8th 2011 involving the W-TAGGED corpus. Query: *konnte /so (MORPH(V PCP PERF) haben)*.

- (651) Auch ein kaum Einjähriger, der es sich gar nicht anders
 also a hardly one.year.old REL.PRN it self INTN NOT else
 ausgesucht haben konnte, wurde bei der
 choose-PPP PRF.AUX-INF can-PST PAS.AUX-PST at the
 ausgelassenen Gaudi im Tragetäschchen auf die Bar
 jolly jamboree in.the carrier.bag on the bar
 gestellt.²¹
 put-PPP
 ‘Even a hardly one year old baby, who couldn’t have agreed, was put on the bar in his
 carrier bag during the jolly jamboree.’
- (652) Sicher glaubt Gernot nicht, dass meine Mutter die Sachen
 certainly thinks Gernot NEG that my mother the things
 im Häuschen ohne meine Mitwirkung zusammengerafft
 in.the hut without my assistance snatch-PPP
 hat. Steffen konnte ihm erzählt haben, dass er mir beim
 PRF.AUX Steffen can-PST him tell-PPP PRF.AUX-INF that he me with
 Transport des Fernsehers geholfen hat.²²
 transportation the-GEN television help-PPP PRF.AUX
 ‘Certainly, Gernot will not think that my mother snatched the things in the hut without
 my assistance. Steffen could have told him that he helped me with the transportation
 of the television.’

Even if the epistemic modal verb in example (652) bears past inflection, its Time of Evaluation is not shifted to the past; rather it remains congruent with the Time of Utterance. Note that this example involves double past marking: on the one hand, the modal verb is inflected for the past (*konnte* ‘can.PST’) and, on the other, the infinitive complement involves the perfect auxiliary and a past participle *erzählt haben* ‘told have-PRF.AUX-INF’. In this respect, it is reminiscent of example (55c) discussed by Erb (2001: 99 Fn. 23). She argues that in examples of this type, the past reference is essentially encoded by the infinitive complement containing a perfect auxiliary. Indeed, if the perfect infinitive is replaced by a simple infinitive (*Steffen konnte ihm erzählen, dass ...*) the past orientation is no longer available.

The result of this small corpus study might be revealing of the nature of epistemic modification. More than 90 % of the occurrences of *können* are in the scope of a negative element. As will be illustrated in the remainder of this section, it is fairly doubtful whether epistemic modifiers can be negated at all. This is a delicate issue because negation provides a further logical operator, and it is not obvious in what way negation could interact with epistemic modal operators. Therefore,

²¹ DeReKo: X99/FEB.04336 Oberösterreichische Nachrichten, 02/02/1999.

²² DeReKo: RHZ09/FEB.22507 Rhein-Zeitung, 25/02/2009.

one should be careful in classifying these examples as epistemic. This could also be the reason why these uses of *können* turn out to be more compatible with past inflection. However, there are a couple of examples that do indeed seem to involve the shift of Topic Time resulting in a past event interpretation.

In examples (653)–(655), the Time of Evaluation is not affected by the past morphology of the modal verb; rather it coincides with the Time of Utterance. The past operator takes scope over the Topic Time. Correspondingly, these sentences encode an assumption at the Time of Utterance about a time interval in the past. Moreover, the deictic centre is clearly identified with the speaker in example (653) and (654). This indicates that these examples do not involve indirect reported speech, which are always characterised by a past shift of the Time Evaluation and typically exhibit context shift of the deictic centre to some third salient party.

- (653) Eine literarische Freiheit Doderers. Denn er musste wissen,
 a literary freedom Doderer-GEN since he must-PST know
 dass die Architekten dieses Doppelhauses [...] ‘Architekt
 that the architects this-GEN double.house-GEN architect
 u. Stadtbaumeister O. Luckeneder u. C. Miserowsky’
 and municipal.master.builder O. Luckeneder and C. Miserowsky
 waren und es also nicht von Brüdern oder gar
 were and it thus NEG by brothers or even
 Zwillingsgeschwistern gebaut wurde.²³
 twins build-PPP PASS.AUX.PST
 ‘[This was ...] Doderer’s deliberate artistic decision. Since he must have known that
 the architects of this house were Luckeneder and Miserowsyk and therefore it neces-
 sarily was not built by brothers or even twins.’
- (654) Die Vorstellung einer Trennung mußte Wagner zutiefst
 the idea a-GEN separation must-PST Wagner to.the.core
 erschrecken²⁴
 frighten-INF
 ‘The idea of separation must have frightened Wagner to the core.’

²³ Der Standard, 11. 9. 2004.

²⁴ Eva Rieger: „Nach meiner Minna verlangt mich’s sehr” – Minna, Richard und der Fliegende Holländer, in programme of *Der fliegende Holländer* directed by Christine Mielizt at the Staatsoper Wien, premiere at 5th December 2003, p. 20.

- (655) Wir erfahren sie [die Entscheidung] nur von Athena, können aber
 we learn she the decision only by Athena can but
 nicht zweifeln, dass die der anderen Richter [...] ebenso subjektiv
 NEG doubt that the the other judges equally subjective
 sein mussten²⁵
 be must-PST

'We only learn about the decision from Athena, but we cannot doubt that the other judges had to be as subjective as well.'

- (656) Mit einem ganzen Werkzeugladen im Gepäck mussten die
 with a entire tool.shop in.the package must-PST the
 Einbrecher in der Nacht auf Mittwoch beim Autohaus Zitta
 burglars in the night to Wednesday at.the car.house Zitta
 eingebrochen haben.²⁶
 burgle-PPP have-INF

'With a whole tool shop in their bags the burglars must have burgled the car store Zitta during the night on Tuesday.'

There is another reason why examples such as (653) cannot be regarded as indirect reported speech. If the past morpheme indicated indirect reported speech, the epistemic modal verb should be construed as a past assumption about Heimito von Doderer's knowledge. According to this interpretation, the deictic centre is assumed at some specific moment in the past: 'Heimito von Doderer must know that the architects are O and C.' In this particular example, this specific moment can be exactly determined by means of the contextual information given. In the process of writing his novel *Die Strudelhofstiege* (1951), Heimito von Doderer decided to refer to a real existing house in the 9th District of Vienna. Yet, for some reason, he did not adopt the real names of the original architects, which are indicated on the front door of the house, but he invented new names. The only time that the assumption given above would make sense would be during Doderer's writing process, when he was choosing the names of these characters. Accordingly, the referent anchored to the deictic centre must have witnessed this time in the early fifties. There are two options to identify the deictic centre in reported speech contexts. It is either the speaker or some other salient third party. If the deictic centre was instantiated by the speaker or author of this newspaper article, it would follow that he witnessed the time of Doderer's writing process, and that he made assumptions about his knowledge at that very time. It is obvious that this

²⁵ Walther Kraus: Das Gericht über Orest bei Aischylos, in Paul Händel (ed.) Festschrift Robert Muth, Innsbruck 1983, S. 206.

²⁶ DeReKo: NON09/NOV.05033 Niederösterreichische Nachrichten, 09/11/2009.

not interpreted as indirect reported speech. Analogously to example (652), this example exhibits a double past marking which is realised by the past morpheme on the epistemic modal verb *brauchte* ‘need-PST’, and by the perfect tense auxiliary *sein* in the infinitive complement. Once again, the Time of Evaluation is not affected by the past morphology and coincides with the Time of Utterance.

- (658) Es muß etwas vorgefallen sein, was ihn kränkte. Frisch
 it must something happen-PPP be-INF that him aggrieved. Frisch
 brauchte das gar nicht bewußt gewesen zu sein²⁸
 need-PST that INTN NEG conciuos be-PPP to be-INF
 ‘Something must have happened that offended him. Frisch does not need to have
 been aware of this.’

The past event interpretation of past inflected epistemic modal verbs is indeed unexpected since the modal operator and the tense operator are interpreted in an inverse order. The modal operator takes scope over the past operator even if the past morpheme attaches to the modal verb. However, this type of inverse scope is not particular to German. As has been illustrated by Hacquard (2006: 38) and Homer (2010: 2), this pattern is very frequent in some Romance languages, such as French, cf. example (659):

- (659) (Selon la voyante) Bingley pouvait aimer Jane.
 according the fortune.teller Bingley can-PST love-INF Jane
 ‘According to the fortune teller, Bingley could have loved Jane.’ (epistemic)

As the English translation of (659) indicates, the past morpheme is interpreted in the scope of the modal operator, rather than the other way around, as is to be expected. As Jędrzejowski (2010: 35) indicates, analogous instances of inverse scope are found with Czech *musel* ‘must-PST’ and Polish *musiałem* ‘must-PST’.

Fintel and Gillies (2008: 87) discuss another potential case of a past operator that takes scope over an epistemic operator, as is illustrated in example (660). Imagine a context in which the speaker was looking for ice cream, checking the fridge, only to find that it was empty. Now, he is asked why he opened the fridge. Even already knowing that there is no ice cream in the fridge he could answer with the following sentence.

- (660) There might have been ice cream in the freezer.
 (661) Es hätte Eis im Kühlschrank drin sein
 it have-SBJV.PST ice.cream in.the fridge in be-INF
 können.
 can-PPP(ipp)

28 DeReKo: R99/JUN.46269 Frankfurter Rundschau, 12/06/1999.

In their own analysis, Fintel and Gillies (2008: 87) assume that in the example above a PAST operator takes scope over the epistemic modal: PAST(*might*(ice cream in the freezer))[sic!]. However, this phenomenon essentially differs from the past event reading. The past tense morpheme on the epistemic modal verb encodes a counterfactual possibility. This becomes even more obvious when we consider the German counterpart in example (661), which involves an overt subjunctive morpheme on the perfect tense auxiliary. Thus, it is fairly likely that the past tense in the English example is also interpreted as irrealis or counterfactual. In this respect, it resembles a phenomenon that Condoravdi (2002) calls *Metaphysical Modality*.

4.4 Excluded from the scope of a counterfactual operator

Coates (1983: 239) argues that epistemic modal verbs in English are never affected by subjunctive morphology. According to her, it is the embedded predication that is interpreted as ‘hypothetical’, rather than the ‘modal predication’ expressed by the epistemic modal verb, as is illustrated in (662). By contrast, their circumstantial counterparts are always interpreted as ‘hypothetical’ whenever they bear subjunctive morphology, as demonstrated in example (663). Both examples below reflect her illustrations.

- (662) *might*_{EPISTEMIC}*P*
 (i) it is possible that would *p*
 (ii) # it would be possible that *p*
- (663) *could*_{CIRCUMSTANTIAL}*P*
 (i) # it is possible that would *p*
 (ii) it would be possible that *p*

However, Coates’ (1983) claim does not extend to German. As illustrated by Kasper (1987: 26), Eisenberg (2004: 117) and Eisenberg et al. (2005: 523), subjunctive morphology in West Germanic languages indicates counterfactuality in the canonical case. In opposition to Coates (1983: 239), there are occurrences of epistemic modal verbs bearing subjunctive morphology in German that are interpreted as counterfactual assumptions which are made by the speaker. This becomes most obvious with the verb *müssen*, since it involves an epistemic interpretation that is very easy to disambiguate from other readings. Consider examples (664)–(667) taken from DeReKo. Similar examples are discussed by Mortelmans (2000: 207).

- (664) Guido Niedermann fand am Waldboden eine Feder. »Ganz
 Guido Niedermann found at forest.ground a feather very
 deutlich ist zu sehen, dass diese Feder abgebissen wurde,
 clearly is to see that this feather off.bite-PPP was

folglich war dieses Federvieh Opfer eines Marders oder
 thus was that poultry victim a-GEN marten-GEN or
 Fuchses. Wäre die Feder ausgerupft worden,
 fox-GEN be-SBJV.PST the feather pinch-PPP PASS.AUX.PPP
 müsste der Täter ein Greifvogel gewesen sein«, erklärte
 must-SBJV.PST the culprit a raptor be-PPP be-INF said
 Niedermann.²⁹
 Niedermann

'Guido Niedermann found a feather in the forest. "It can be seen very clearly that this feather was bitten off. Thus, this poultry was the victim of a marten or a fox. If the feather were pinched, it would follow from that the culprit must have been a raptor." said Niedermann'

- (665) Wenn alle Meldungen über Schwangerschaften der
 if all reports about pregnancies the-GEN
 Oscar-Preisträgerin gestimmt hätten, müsste sie
 oscar-winner attune-PPP have-SBJV.PST must-SBJV.PST she
 mittlerweile 30 Babys bekommen haben. Kidman ist Mutter
 meanwhile 30 babies get-PPP have-INF. Kidman is mother
 zweier adoptierter Kinder.³⁰
 two-GEN adopted-GEN children

'If all of those reports about the Oscar winner's pregnancies had been true, then she would have had 30 babies by now. Kidman is the mother of two adopted children.'

- (666) Wenn dem so wäre, müsste die Telekom hier
 if the-DAT so be-SBJV.PST must-SBJV.PST the Telekom here
 ausnahmsweise einen Mitarbeiter beauftragt haben, der
 exceptionally a assistant commission-PPP have-INF who
 ganz unterschiedliche Namen trägt, sehr häufig unterwegs ist
 very different names bears very frequently on.the.road is
 und mal Mann, mal Frau ist.³¹
 and sometimes man, sometimes woman is

'If that were right, the Telekom would need to have exceptionally commissioned an assistant who has a lot of different names, who is frequently away on business, who is sometimes a man and sometimes a woman.'

²⁹ DeReKo: A00/FEB.13497 St. Galler Tagblatt, 22/02/2000.

³⁰ DeReKo: BRZ07/DEZ.11819 Braunschweiger Zeitung, 31/12/1007.

³¹ DeReKo: NUN07/NOV.01946 Nürnberger Nachrichten, 15/11/2007.

- (667) Ich müsste einiges falsch verstanden haben. Aber
 I must-SBJV.PST wrong understand get-PPP have-INF but
 das schließe ich aus, die Initiatoren sprechen sehr gut Deutsch.³²
 that conclude I out the initiators speak very well German
 '[In that case,] I would have got something wrong. But I exclude that since the initiators speak German very well.'

The two counterfactual conditionals in examples (665) and (666) are based on premises that the speaker considers as false. In the first example, the proposition expressed by the antecedent of the conditional 'All reports about the pregnancy are true' is labelled as counterfactual by the speaker. Likewise, the assumption encoded by the epistemic operator *müsste* is not factual, that is, the speaker does not assume that Kidman had 30 babies. He would only be led to this conclusion if the proposition expressed by the antecedent of the conditional held for the actual world. In a similar manner, the proposition encoded by the antecedent 'This is right' is refuted by the speaker. Moreover, the assumption expressed by *müsste* is not actual, but hypothetical. The speaker does not conclude in the actual world that the Telekom commissioned assistants who were that strange. A similar reasoning applies to example (667); the assumption encoded by the epistemic operator is not made in the actual world; accordingly, it is a counterfactual one.

To summarise, all of the occurrences of epistemic modal verbs bearing subjunctive morphology discussed above exactly reflect the corresponding counterfactual interpretation. This indicates that epistemic modal verbs can, in principle, be affected by operators that induce a counterfactual interpretation. However, this does not mean that epistemic modal verbs with subjunctive morphology are always construed in a counterfactual way. The interplay of subjunctive morphology and epistemic operators turns out to be manifold and not well understood, as the examples given by Coates (1983: 239) illustrate. Extensive discussion of this matter is given in the relevant sections on the epistemic interpretations of the verbs *können* (cf. Section 2.2.1.5), *müssen* (cf. Section 2.2.2.5) and *sollen* (cf. Section 2.2.6.5).

4.5 Excluded from nominalisations

Zifonun (1997: 1271) discusses an interesting diagnostic that has not attracted much attention so far. As she argues, nominalisations of the traditional six modal verbs can never be interpreted epistemically.

³² DeReKo: BRZ07/JUL.00418 Braunschweiger Zeitung, 21/07/2007.

- (668) Das (Helfen-)Wollen nützt nichts, Können muß
 the help-INF.want-INF.NOUN serves nothing can-INF.NOUN must
 hinzukommen.
 come.along

The will to help alone is not enough, knowledge is also necessary.'

However, her examples are not well chosen. Even in its use as a finite verb, *wollen* would not obtain a distinct epistemic or reportative interpretation with an eventive predicate such as *helfen* 'help'.

As a small corpus study based on the DeReKo corpus shows, each of the investigated items differs with respect to its frequency and productivity. The most frequent nominalisations involve *können* (550 occurrences), *wollen* (300 occurrences) and *müssen* (70 occurrences). Crucially, most of these examples involve hapax legomena and ad hoc creations. This indicates that nominalised modal verbs cannot be considered as fixed lexicalised expressions. Rather, they are derived from a fully productive morphological nominalisation rule. Furthermore, the lack of an orthographic convention stresses the ad hoc character of these patterns. By contrast, the remaining modal verbs are not so frequently attested. The element *sollen* can only be found in a couple of cases, as in example (672), which is taken from a discussion about morals. Likewise, *dürfen* occurs about twenty times, most notably dominated by instances of the nominalisation *Nichtvergessendürfen* 'the non-permission/prohibition to forget', an expression that was made popular by the novelist Martin Walser. Finally, *mögen* only occurs once as a nominalisation (cf. 674).

- (669) Es war ein gegenseitiges
 it was a mutual
 Sich-aufeinander-verlassen-Können, was aber auf großer
 REFL.on.each.other.rely-INF.can-INF.NOUN which but on big
 Diskretion und Eigenständigkeit auf beiden Seiten beruhte.³³
 discretion and independence on both sides relied

'It was a mutual reliability which was based on great discretion and independence on both sides.'

- (670) Somit ist das Nicht-mehr-rauchen-Wollen der Urheber
 therefore is the NEG.more.smoke-INF.want-INF.NOUN the cause
 dieses Phänomens.³⁴
 this-GEN phenomenon-GEN

'Accordingly, the intention to quit smoking is the cause of this phenomenon.'

33 DeReKo: HMP06/MAR.00537 Hamburger Morgenpost, 06/03/2006.

34 DeReKo: E98/JUL.17748 Zürcher Tagesanzeiger, 18/07/1998.

- (671) Das Wartenmüssen fällt uns schwer.³⁵
 the wait-INF.must-INF falls REFL difficult
 ‘The necessity to wait is difficult for us.’
- (672) Nun ist zwischen Sein und Seinsollen ein
 PART is between be-INF.NOUN and be-INF.shall-INF a
 durchaus merkbarer Unterschied,³⁶
 completely appreciable difference
 ‘There is an appreciable difference between how things are and how things ought to be.’
- (673) Es ist das von früher Kindheit an erlernte
 it is the of early childhood on learned
 „Nicht-aus-einem-Konkurrenzsyste-m-herausfallen-Dürfen“, das
 NEG.off.a.competitive.system.out.fall-INF.may-INF that
 zu erhöhtem Niveau körperlicher und seelisch-geistiger
 to increased level physical-GEN and mental-GEN
 Spannung führt.³⁷
 tension leads
 ‘It is the prohibition to not fall out from a competitive system that leads to an increased level of physical and mental tension.’
- (674) Egal, Schwamm drüber, es lohnt sich nicht, über
 anyway sponge over it pays REFL NEG about
 Standfestigkeit, Glauben-machenmögen und
 resolution believe-INF.make-INF.want-INF.NOUN and
 Glauben-wollen zu schwadronieren.³⁸
 believe-INF.want-INF.NOUN to swagger
 ‘Anyway, no hard feelings! It does not pay to swagger about resolution, the intention to pretend something and the insistence to believe something.’

Moreover, it merits attention that the modal verbs remain semantically accessible in these patterns. The nominalised modal verb can be affected by a negation, as in examples (670) and (673).

By and large, these examples support the generalisation proposed by Zifonun (1997). However, there is an instance of a nominalised modal verb *müssen* which arguably involves an epistemic interpretation, as is shown in example (675).

35 DeReKo: BRZ07/DEZ.19660 Braunschweiger Zeitung, 07/12/1007.

36 DeReKo: N95/MAI.18015 Salzburger Nachrichten, 13/05/1995.

37 DeReKo: N95/OKT.40437 Salzburger Nachrichten, 19/10/1995.

38 DeReKo: V00/NOV.57933 Vorarlberger Nachrichten, 18/11/2000.

- (675) Hier ist nicht die Rede von behauptetem
 here is NEG the discussion about alleged
 „Gewußt-haben-Müssen“ des Präsidenten. Auch denken wir
 know.PPP.INF.INF.NOUN the-GEN president-GEN also think we
 nicht an die vielen, jedoch ganz anderen Dinge, die Bögl in
 NEG at the many but very different things REL.PRN Bögl in
 der Vergangenheit unbewiesen nachgesagt wurden.³⁹
 the past non-proven after.say-PPP PASS.AUX.PST
 ‘What is considered here is not the allegation that the President must have known.
 Likewise, we do not think about the various things that Bögl has been accused of in
 the past without any proof.’

The past-related interpretation of the complement of *müssen* indicates that the interpretation has to be epistemic. However, the fact that the author enclosed the nominalisation of *müssen* with quotation marks could be a hint that he does not consider it as fully acceptable. Indeed, the usage of *müssen* in example (675) sounds rather awkward to native speakers of German.

4.6 No verbless directional phrase complements

As pointed out by Barbiers (1995: 153, 2002: 54), Erb (2001: 94), Vater (2004: 18), Eide (2005: 9) and Mortelmans, Boye and Auwera (2009) for various Germanic languages, epistemic modals do not embed verbless directional phrases. None of examples given in Section 2.2.1.4 can be interpreted in an epistemic way, not even the one with an inanimate subject (cf. 78, repeated here as 676). Usually, inanimate subjects facilitate a disambiguation in favour of an epistemic interpretation. Instances in which *dürfte* and *mag* select a verbless directional phrase are rare and often include subject NPs that are specified for the 1st person, which is a rather unexpected environment for epistemic modal verbs.

- (676) Die Sonnenwärme kann hinein, aber nicht wieder heraus.⁴⁰
 the sun.heat can in but NEG again out
 ‘The heat of the sun can get in but it cannot get out again.’
 # Epistemic: ‘It is likely that the heat of the sun is getting in but not out again.’
- (677) Nachwuchs muss her.⁴¹
 offspring must to.here
 ‘Offspring is needed.’

³⁹ DeReKo: P94/NOV.38347 Die Presse, 18/11/1994.

⁴⁰ DeReKo: RHZ09/FEB.09586 Rhein-Zeitung, 11/02/2009.

⁴¹ DeReKo: A10/FEB.06142 St. Galler Tagblatt, 20/02/2010.

- (678) Ich würde sogar Gras essen, wenn ich nur wieder zurück
 I would even grass eat if I only again back
 dürfte. Meine Heimat, meine Heimat.⁴²
 may-SBJV.PST my home, my home
 'I would even eat grass if I was only allowed to go back to my home, my home.'
- (679) Ich mag nicht schwimmen. Ich mag nach Hause.⁴³
 I may NEG swim-INF I may to home
 'I don't want to swim, I want to go home.'

Riemsdijk (2002: 166) discusses an example of the Dutch modal verb *zullen* with a verbless directional phrase that could come into consideration for an epistemic interpretation.

- (680) Jij zou toch naar Antwerpen.⁴⁴
 you should PAR to Antwerp
 'Weren't you supposed to have gone to Antwerp?'

But as it is restricted to a highly marked environment which is rather uncommon for epistemic modal verbs, further evidence is needed to decide whether it can indeed be considered as a genuine epistemic modal verb.

4.7 No VP-anaphora

As argued by Ross (1969: 87), Askedal (1997: 13, 1998: 60), López and Winkler (2000: 639) and Drubig (2001: 30), VP anaphora is only possible with modal verbs that have a circumstantial interpretation, but not with epistemic ones, as is illustrated in example given by Ross (1969):

- (681) # Ottokar muss Krebs haben, und du musst es auch / und das
 Ottokar must cancer have and you must it too / and that
 musst Du auch.
 must you too
 'Ottokar must have cancer and you must (have it) too.'

Similar observations have been made for Norwegian by Eide (2005: 9). According to López and Winkler (2000: 624), the peculiarity of German is that VP-Anaphora always has to be realised by an overt pronoun, as opposed to English, where there

⁴² DeReKo: N93/NOV.41072 Salzburger Nachrichten, 11/11/1993.

⁴³ DeReKo: K00/FEB.10231 Kleine Zeitung, 06/02/2000.

⁴⁴ As quoted in Riemsdijk (2002: 166)

is no overt realisation at all. As pointed out by Reis (2001: 299 Fn. 18), it is nevertheless possible for the VP-anaphora *das* to be licensed by epistemic *müssen*:

- (682) a. A: Sie könnte schlafen.
 She can-SUB.PST sleep-INF
- b. B: Hm, das muß sie wohl.
 Hm that must she perhaps.
 A: 'She could be sleeping.'
 B: 'Perhaps, she must (it)'

Note, however, that B's answer equally contains the modal particle *wohl*, lit. 'perhaps'. Without the particle, the acceptability of this utterance decreases significantly. It remains to be seen what exactly the semantic contribution of this particle is. Moreover, it seems that the two VP-anaphora *das* and *es* behave differently, as the latter would not be acceptable in this context (cf. 682).

A small corpus study brought to light some instances of VP anaphora *es* that are arguably selected by an epistemic modal verb. First of all, there is an example with *könnte* that selects an eventive predicate resulting in a future oriented reading (cf. 683). But there are also examples that involve epistemic modal verbs occurring in a more typical context, such as example (685), where it embeds a predicate that refers to a state that cannot be changed (cf. 685–686), or where it embeds a past related complement. Note that in cases with *müssen*, the epistemic modal verb bears a high pitch accent, which indicates contrastive focus.

- (683) Die Staatsrechtler könnten da schon weiterhelfen, und
 the constitutional.lawyer could there PART help-INF and
 der Blick auf andere EU-Länder könnte es auch.⁴⁵
 the look at other EU-countries could VPAN too
 'The experts in constitutional law could help in this case and a look at other EU-
 countries could, too.'
- (684) „Das kann er sein, muss es aber nicht“, sagten
 this can he be-INF must VPAN but not said
 Zeuginnen und Zeugen dem Gericht: „Nach dem
 witness-FEM.PL and witness-masc.pl to.the court after the
 Gesamteindruck als Täter nicht auszuschließen... Weiß nicht,
 overall.impression as culprit NEG to.rule.out-INF know NEG
 Brille, Kappe, das könnte hinkommen... Normale Beine in
 glasses cap that could match-INF normal legs in
 normalen Jeans...“⁴⁶
 normal jeans

⁴⁵ DeReKo: NUN98/JAN.02448 Nürnberger Nachrichten, 31/01/1998.

‘“It could be him but it does not need to be the case”, the witnesses told to the court: “According to the overall impression, he comes into consideration as the culprit... don’t know, glasses, cap that could match... normal legs in normal jeans...”’

- (685) Das könnte so gewesen sein, muss es aber nicht.⁴⁷
that could so be-PPP be-INF must VPAN but NEG

‘That could have been like that, but it does not have to be the case.’

- (686) Es könnte dazu beigetragen haben, muss es aber nicht.⁴⁸
it could there.to contribute have must VPAN but NEG

‘It could have contributed to that but it does not need to be the case.’

As all of the examples involve clearly identified deictic centres, the most plausible interpretation is a ‘subjective’ epistemic one. This becomes most obvious with example (684), where the deictic centre is overtly realised as a subject of the superordinate predicate *sagen* ‘say’. Interestingly, not all of the epistemic modal verbs could be found with VP-anaphora. In the case of *dürfte*, only occurrences with circumstantial interpretations could be found, as is shown in example (687).⁴⁹

- (687) Nimmt sie den Mund zu voll? Das dürfte sie auch. Es
takes she the mouth too full VPAN may-SBJV.PST she also it
würde keiner wagen, ihr den Mund zu verknebeln und sie an
would nobody dare her the mouth to gag and she to
einen Baum zu fesseln, wenn ein Fest ansteht.⁵⁰
a tree to tie when a feast up.comes

‘Is she boasting? It would be okay for her to do so. Nobody would dare to gag her and tie her to a tree.’

Since there are clear instances of epistemic modal verbs that involve VP-anaphora, it is rather doubtful that this should really be considered as a valid restriction on epistemic modal verbs. Nevertheless, it remains to be explained why VP-anaphora fails to apply to complements of epistemic modal verbs in so many other cases, as in the ones observed by Ross (1969).

⁴⁶ DeReKo: RHZ00/MAI.11637 Rhein-Zeitung, 17/05/2000.

⁴⁷ DeReKo: M05/JAN.00302 Mannheimer Morgen, 04/01/2005.

⁴⁸ DeReKo: HAZ09/JUN.00510 Hannoversche Allgemeine, 04/06/2009.

⁴⁹ The investigation was based on the query “das dürfte /+w4 auch /w0 .” Likewise, the query “muss es auch /w0 .” yielded only instances with circumstantial interpretation (29 hits).

⁵⁰ DeReKo: A08/JUN.03650 St. Galler Tagblatt, 13/06/2008.

4.8 No separation in *wh*-clefts

To some extent, German modal verbs can be used in *wh*-clefts (see for instance Engel (1991: 299)). As has been shown by Lenz (1996: 416), modal verbs in *wh*-clefts which are separated from their infinitive complements are disambiguated with respect to the scope of the negation. Even though this is rare, *wh*-clefts which contain modal verbs are attested in corpora, as is shown in examples (688) to (704). The only modal verb that could not be documented in the DeReKo corpus is *müssen*. For this item, an occurrence from the web was chosen, which will be discussed below.⁵¹ Interestingly, the infinitive complement that originally belongs to the modal verb, now being realised as a complement of the copula *ist*, can either be realised as a bare infinitive, as in examples (689) and (691), or as a *zu*-infinitive, as in (688) and (690).⁵² The precise choice is obviously influenced on the lexical item: In the case of *mögen*, three of the four occurrences that could be found take a *zu*-infinitive. In contrast, *wollen* occurs ten times with a *zu*-infinitive and seven times with a bare infinitive. As it seems, the decisive factor is the regional variety. The vast majority of the cases with bare infinitives stem from newspapers from Switzerland, Southern Germany or Austria.

⁵¹ The investigation of the DeReKo corpus was carried out on 1th September 2011, based on queries such as “was /+w8 (&müssen ist)” and “was /+w8 (&sollen ist)”.

⁵² The *zu*-infinitive might be a selectional requirement of the copula. In German *wh*-clefts, the morphological format of the phrase which is coreferent with the *wh*-phrase *was* is determined by the copula and not by its original host predicate. Accordingly, the version in which the NP gets predicative nominative case from the copula (cf. 1) is clearly preferred over the version in which the NP retains its original accusative case (cf. 2). But the selection of that complement cannot be driven by the copula alone, as the complement clause in example (3) is clearly selected by the predicate *wollen* in the *wh*-clause.

- (1) Denn was die Jugend will, ist ein einheimischer Sender.
since what the youth wants is a-NOM domestic-NOM channel
'What the youth wants is a domestic channel.'
DeReKo: E99/JAN.01479 Zürcher Tagesanzeiger, 20/01/1999.
- (2) ?? Denn was die Jugend will, ist einen einheimischen Sender.
since what the youth wants is a-ACC domestic-ACC channel
- (3) Was ich nicht will, ist, dass aus dem Dancing eine Spelunke wird.
what I NEG want is that from the Dancing a gin-mill becomes
'What I do not want is that the Dancing turns into a kind of gin-mill.'
DeReKo: A99/APR.27873 St. Galler Tagblatt, 21/04/1999.

- (688) „Was Kirche gut kann, ist feiern“, sagt Christina Koch.⁵³
 what church well can is celebrate says Christina Koch
 ‘What the church can handle well is to celebrate, says Christina Koch.’
- (689) Was der Staat kann, ist den Banken Zeit zu schenken.⁵⁴
 What the state can is the bank time to give
 ‘What the state could do, is to give the banks time.’
- (690) Was wir können, ist größtmögliche Flexibilität zeigen.⁵⁵
 what we can is biggest.possible flexibility show
 ‘What is possible for us is to show a maximum of flexibility.’
- (691) Was wir definitiv können, ist uns klar von Dopingsündern zu
 what we definitely can is us clearly from doping.sinners to
 distanzieren.⁵⁶
 distance
 ‘What we can definitely do is to distance ourselves from doping sinners’
- (692) Was Gerhard Schröder nicht darf und will, ist die Rolle des
 what Gerhard Schröder NEG may or wants is the role the-GEN
 Vermittlers einnehmen.⁵⁷
 mediator-GEN in.take-INF
 ‘What Gerhard Schröder should not and does not want to do is to take the role of a
 mediator.’
- (693) Was Stefan Köhl nicht will, ist, „noch ein Gutachten mehr in der
 what Stefan Köhl NEG wants is yet a review more in the
 Schublade zu haben“.⁵⁸
 drawer to have-INF
 ‘What Stefan Köhl does not want is to have a further review in his drawer.’
- (694) Was Richy Müller vor allem will, ist, sich nicht festzulegen.⁵⁹
 what Richy Müller above all wants is REFL NEG to.commit-INF
 ‘What Richy Müller wants , above all, is to not commit himself.’

53 DeReKo: BRZ09/MAR.06146 Braunschweiger Zeitung, 13/03/2009.

54 DeReKo: VDI09/APR.00521 VDI nachrichten, 24/04/2009.

55 DeReKo: NON09/MAR.04046 Niederösterreichische Nachrichten, 09/03/2009.

56 DeReKo: NON09/FEB.00367 Niederösterreichische Nachrichten, 02/02/2009.

57 DeReKo: NUN00/NOV.00017 Nürnberger Nachrichten, 01/11/2000.

58 DeReKo: RHZ98/JUN.33947 Rhein-Zeitung, 30/06/1998.

59 DeReKo: M09/DEZ.96667 Mannheimer Morgen, 05/12/1009.

- (695) Was er seit „Ziggy Stardust“ will, ist sich ständig zu
 what he since Ziggy Stardust wants is REFL constantly to
 verändern, ständig Rollen zu tauschen.⁶⁰
 change-INF constantly role to exchange-INF
 ‘What he keeps wanting to do since “Ziggy Stardust” is to constantly change, to constantly exchange roles.’
- (696) Was er nicht darf, ist, während des Trainings mit den Kindern
 what he NEG may is during the training with the children
 in Kontakt zu treten und das Training stören.⁶¹
 in contact to step-INF and the training disturb-INF
 ‘What he is not allowed to do is to be in contact with the children during the training and to disturb the training.’
- (697) Was man nicht darf, ist, kurz vor Wahlen aufzurufen, die
 what one NEG may is shortly before elections to.up.call-INF the
 Konkurrenz zu wählen.⁶²
 adversary to vote-INF
 ‘What one should not do is to make a call shortly before the elections to vote for the adversaries.’
- (698) Was man nicht darf, ist wegschauen, die Zügel schleifen lassen.⁶³
 what one NEG may is away.look-INF the rein go-INF let-INF
 ‘What one should not do is to look away, to slacken the reins.’
- (699) Und was er überhaupt nicht mag, ist, herumzuliegen.⁶⁴
 and what he at.all NEG likes is to.around.lie-INF
 ‘And what he does not like at all is to lie around.’
- (700) Was dieses Haustier überhaupt nicht mag, ist tagsüber
 what this pet at.all NEG likes is during.the.day
 alleingelassen und eingesperrt zu werden.⁶⁵
 alone.left or in.penned to PASS.AUX-INF.
 ‘What this pet does not like at all is to be left alone or trapped during the day.’

60 DeReKo: N97/FEB.06423 Salzburger Nachrichten, 13/02/1997.

61 DeReKo: A01/AUG.23631 St. Galler Tagblatt, 29/08/2001.

62 DeReKo: HMP08/AUG.00134 Hamburger Morgenpost, 02/08/2008.

63 DeReKo: P98/JUN.25019 Die Presse, 20/06/1998.

64 DeReKo: HMP06/DEZ.02015 Hamburger Morgenpost, 20/12/1006.

65 DeReKo: NON07/OKT.06447 Niederösterreichische Nachrichten, 09/10/2007.

- (701) Was er an seinem Beruf nicht mag, ist simpel und
 what he about his profession NEG likes is simple and
 einfach schlafen: „Wenn ich nicht müsste, würde ich nie
 simple sleep if I NEG must-SBJV.PST would I never
 schlafen.“⁶⁶
 sleep-INF
 ‘What he simply does not like about his profession is sleeping: If I didn’t have to, I
 would never sleep.’
- (702) Was ich nicht mag, ist, in Rütli-Schwur-Augen zu gucken und per
 what I NEG like is in Rütli-Oath-eyes to look and by
 Handschlag die Welt versprochen zu kriegen⁶⁷
 handshake the world promise-PPP to get-INF
 ‘What I do not like is to look into Rütli-Oath-eyes and be promised the world by hand-
 shake.’
- (703) Was wir aber nicht sollten, ist Bürgern vorwerfen, daß sie
 what we but NEG shall-SBJV.PST is citizen blame-INF that they
 ihre Vergangenheit nicht bewältigt hätten.⁶⁸
 their past NEG overcome-PPP have-SBJV.PST
 ‘What we should not do is to blame citizens for not having come to terms with their
 past.’
- (704) Was Kunst aber nicht sollte, ist sich aus der Frage,
 what art but NEG shall-SBJV.PST is REFL out the question
 welche ästhetischen Mittel angemessen sind, einfach
 what aesthetic means appropriate are simply
 herauszulügen.⁶⁹
 out.to.lie-INF
 ‘What art should not do is to avoid the issue of which aesthetic means are appropri-
 ate.’
- (705) was du musst, ist mal deine packungsbeilage durchlesen
 what you must is once your package.insert through.read-INF
 mädel – da steht das drin!⁷⁰
 gal there stand it in
 ‘What you have to do is to read your package insert, gal – it’s all written in there.’

⁶⁶ DeReKo: NON09/SEP.05962 Niederösterreichische Nachrichten, 09/09/2009.

⁶⁷ DeReKo: SOZ09/JUN.00751 Die Südostschweiz, 05/06/2009.

⁶⁸ DeReKo: RHZ97/FEB.14043 Rhein-Zeitung, 24/02/1997.

⁶⁹ DeReKo: HAZ08/NOV.04835 Hannoversche Allgemeine, 27/11/2008.

⁷⁰ http://www.beepworld.de/cgi-bin/forum_de/f2/pille-durchfall-228274.html, accessed on 2nd September 2011.

As indicated by Thráinsson and Vikner (1995: 60), an epistemic modal verb cannot be separated from its infinitive complement in *wh*-clefts in Danish and Icelandic. Eide (2005: 9) comes to an analogous conclusion for Norwegian. Erb (2001: 88) and Vater (2004: 18) adopts this view for German. Example (706) given by Erb (2001) involves a perfect infinitive, which usually favours an epistemic interpretation. Nevertheless, it could only be interpreted in a circumstantial way.

- (706) # Was sie kann, ist die Kekse gegessen haben.
 what she can is the cookies eat-PPP have-INF
 Intended: ‘What could be the case is that she has eaten the cookies.’

Similarly, all of the corpus examples provided above fail to be interpreted in an epistemic manner. It deserves closer attention that, among the examples found in the DeReKo corpus, the ability reading prevails for *können* in *wh*-clefts. Furthermore, clear cases of control verbs such as *wollen* and the emotive reading of *mögen* are far more often attested in this *wh*-cleft pattern than *sollen* and *müssen*. This is on par with Thráinsson and Vikner (1995: 62), who argue that only control verbs involve enough argument structure to license the pronoun *was* in the *wh*-clause. According to them, all of the modal verbs that occur in the *wh*-cleft configuration discussed above have to be control verbs, even deontic ones. In a similar vein, Erb (2001: 88) proposes that the subject in the *wh*-clause needs to be licensed by some predicate that assigns a semantic role to it. Since raising verbs lack a subject argument of their own, they do not come into consideration.

Since it is not obvious whether there are deontic modal verbs involving a control configuration, an alternative explanation is required. As can be seen, the compatibility with *wh*-clefts is a diagnostic that is structurally related to the ability to license VP-anaphora; in both cases the modal verb selects some sort of pronoun that refers to an event. Assuming that circumstantial modal verbs are event modifiers, a potential new licenser for the two types of anaphoric elements becomes available. This could explain why the reportative control verb *wollen* is less acceptable in such configurations than its volitional counterpart, as illustrated in Section 2.2.3.7 and Section 3.2.

4.9 May not bear sentence accent

Öhlschläger (1989: 207) claims that (‘subjective’) epistemic modals lack the ability to bear “sentence accent”. Likewise, Kiefer (1984: 67) argues that ‘objective’ epistemic modal verbs in German are more appropriate carrying stress than subjective epistemic ones. Crucially, both of them adopt the perspective taken by Lyons (1977: 797–809), who assumes a distinction between objective and subject-

ive epistemicity. According to the perspective taken by Öhlschläger (1989:192), the evidence available to the discourse participants plays a key role for the interpretation of objective epistemic modals. Correspondingly, an objective epistemic modal verb expresses that the modified proposition logically follows from the evidence accessible to the discourse participants in the case of necessity modal verbs such as *müssen*, or that the modified proposition is consistent with that evidence in the case of possibility modal verbs such as *können*. By contrast, Öhlschläger (1989:202) assumes that ‘subjective’ epistemic modal verbs may involve a judgement that is based on ‘less rational conclusions’. As will be shown in Section 4.22, however, the assumption of an independent class of objective epistemic modal verbs lacks empirical support. Most of the elements that come into consideration are clear cases of circumstantial modals, the rest turns out to behave exactly as ‘subjective’ epistemic modal verbs do.

In essence, subjective epistemic modals differ in that they are always interpreted with respect to the speaker who arrives at a conclusion based on his own knowledge. Of course, objective modal verbs also involve some kind of judgement by the speaker. It is not trivial to determine the particular nature of this judgement. Lyons (1977: 808) assumes that subjective epistemicity is more basic in everyday language, and that objective epistemicity is derived from its subjective counterpart by an operation of objectification.

Öhlschläger (1989: 192) argues that the epistemic modal verbs *müssen*, *können* and *dürfte* occur in both variants, in a subjective and an objective one. Furthermore, Öhlschläger (1989: 207) claims that epistemic *mögen* is the only modal verb that does not involve an objective epistemic interpretation, as is illustrated in the examples below, in which underscore indicates a high pitch accent.

- (707) a. Der Angeklagte muss/dürfte/kann der Täter sein.
 the accused must/might/can the culprit be
 ‘The accused must/might/can be the culprit/’
- b. * Der Angeklagte mag der Täter sein.⁷¹
 the accused may the culprit be
 ‘The accused may be the culprit (but...)’

Öhlschläger’s (1989) reasoning is not convincing. First of all, it needs to be determined what exactly the interpretative effect of the accentuation is. In non-tone languages such as English or German, the placement of a high pitch accent is a common strategy to express focus, as has been illustrated by Selkirk (1984: 207) and Jacobs (1988: 114). Furthermore, Höhle (1982: 88, 93) and Höhle (1992: 112)

⁷¹ The acceptability judgements reflect those found in Öhlschläger (1989: 207).

have illustrated that an accent on the lexical verb yields either a lexical focus on the verb, focus on the tense morpheme or verum focus. In any case, focus induces a set of alternatives, as has been illustrated by Rooth (1985: 13), Rooth (1992), Jacobs (1988: 91), and Krifka (2007). At this point, the question arises what set of alternatives is referred to when the epistemic modal verb is in focus. Consider the small conversation in example (708):

- (708) a. A: Es hat sich herausgestellt, der Angeklagte ist nicht der
 it has self out.turn-PPP the accused is NEG the
 Täter.
 culprit
- b. B: Aber... der Angeklagte muß der Täter sein.
 but the accused must the culprit be
- c. C: Moment mal! Der Angeklagte kann/könnte der Täter sein,
 moment once the accused can/could the culprit be
muß es aber nicht.⁷²
 must it but not
- 'A: It turned out that the accused was not the culprit.'
- 'B: But ... the accused must be the culprit.' ≠ ???
- 'C: Hold it... the accused could be the culprit but it does not need to be the case.'
 ≠ *muß*, 'must', (□)

What is in focus in the conversation above is apparently something different for each modal verb. In the case where epistemic *kann* bears stress (cf. 708c), things are simple. It is in opposition to epistemic *muss*. Since these two items differ minimally in terms of their modal force, the set of alternatives becomes evident: it consists of the modal force of *müssen*, which is necessity (□, ∀) and the one of *können*, which is possibility (◇, ∃).

⁷² The last clause in example (708c) seems to involve an epistemic modal verb that selects some sort of VP-anaphora. Accordingly, it is a potential counter-example to the criterion discussed in 4.7. Yet, it is not entirely clear whether this anaphora only refers to the predicative phrase selected by the copula *der Täter* 'culprit' or indeed the entire infinitive complement. It becomes significantly less acceptable if the copula is replaced by a past related complement, as in the example given below:

- (1) ? Er kann ihm geholfen haben, muss es aber nicht.
 he can him help-PPP have-INF must it but NEG
 'He could have helped him, but it needn't to be the case.'

The case in which *muss* bears stress (cf. 708b) turns out to be pretty intricate. Since the preceding utterance does not contain any modal verb, the element in focus cannot be the modal force. Roughly speaking, what speaker B highlights is that he has evidence or knowledge that makes speaker A's statement implausible or impossible. So what is in focus here is obviously the modal base in terms of Kratzer (1981) and Kratzer (1991). The two utterances differ in more than one feature: Firstly, they differ in terms of illocutionary force. While A's utterance is a canonical declarative clause and hence an assertion, B's utterance contains an epistemic modifier, its precise illocutionary force is contested in contemporary research. Secondly, they differ with respect to negation. A's contribution contains a proposition in the scope of negation whereas B expresses the positive proposition.

As can be seen, the type of focus applied by B in example (708b) is related to the phenomenon usually referred to as VERUM focus. As Höhle (1992: 112) argues, a speaker who makes use of a VERUM focus stresses that he considers the embedded proposition to be true. Accordingly, speaker A could insist on his claim by rendering B a reply containing a VERUM focus which is usually realised on the finite verb in main clauses: 'Er ist es aber nicht.' ('But he isn't'). Speaker B in turn, could also insist on his viewpoint repeating (708b), maintaining the stress on *muss*. As this indicates, focus on epistemic verbs and VERUM focus are two closely related phenomena and a unified account seems possible. In a similar vein, Erb (2001: 58) has already highlighted some analogies between epistemicity and VERUM focus. Moreover, the raising verb *scheinen* can occur in similar configurations, as has been illustrated in Section 2.2.11.

Back to the main issue – can subjective epistemic modal verbs bear stress? As demonstrated by Kratzer (1978) and Kratzer (1981), it is possible to trigger the respective reading employing appropriate adverbial clauses. This method should be applicable to the distinction between subjective versus objective epistemic interpretations as well. An adverbial clause such as 'Aber nach dem, was ich weiß, ...' ('but according to what I know') should force a subjective epistemic reading. If one assumes an objective epistemic interpretation in terms of Lyons (1977) and Öhlschläger (1989), it should be triggered by an adverbial clause such as 'Aber so wie es aussieht' ('but as it appears'). As it turns out, the first option is the more appropriate for B's reply. Note that in this adverbial clause the personal pronoun *I* will typically receive stress, thus contrasting the speaker's knowledge with the knowledge of other interlocutors. This observation supports the assumption that the element under focus is something like an epistemic modal base in terms of Kratzer (1978) and Kratzer (1981). This in turn indicates that even subjective epistemic modals can be stressed.

Öhlschläger's (1989) reasoning is not convincing for further reasons. According to him, there is only one modal verb that does not involve an objective epi-

stemic interpretation: *mögen*. Therefore, he concludes that, whenever epistemic *mögen* is not compatible with a particular distribution, it is due to its subjective epistemic nature. This conclusion is not licit since epistemic *mögen* might be barred in this specific environment for some other reason. As pointed out by Bech (1949: 23), Welke (1965: 110), Öhlschläger (1989: 187 Fn. 121), Fritz (1991: 48), and Diewald (1999: 236) epistemic *mögen* usually conveys a concessive meaning and behaves in a marked way. Only in rare cases does it denote a neutral assumption. As Welke (1965: 165) observes, these occurrences can, in particular, be found in fiction, which is known to employ a potentially archaic use of language. In a similar fashion, Fritz (1997: 9) notices that epistemic *mögen* does not occur frequently in Contemporary German. This is in accordance with Diewald (1999: 236, 392), who demonstrated that those cases in which epistemic *mögen* denotes a neutral assumption have almost become extinct. As she concludes, neutral epistemic *mögen* was replaced by its counterpart with concessive flavour. In a similar fashion, Allard (1975: 88) assumes that concessive *mögen* is derived from its neutral epistemic counterpart. A more detailed discussion can be found in Section 2.2.7.7.

Recall that it has been shown above that even subjective epistemic modal verbs can carry stress. Accordingly, the reason why epistemic *mögen* is not compatible with those contexts suggested by Öhlschläger (1989: 207) is not due to its ‘subjective’ epistemic nature, but rather due to its marked concessive meaning. In order to receive contrastive focus and stress, an epistemic modal verb requires a counterpart that only differs minimally from it: *können* and *müssen* seem to form such a pair, whereas *dürfte*, *mag*, *sollte* and *wird* appear to lack appropriate counterparts. Moreover, it becomes evident that there is no need to postulate a separate class of objective epistemic modal verbs. Some of the putative objective modal verbs turn out to be subjective epistemic modals; the majority, however, behave like circumstantial modals in every respect, as will be shown in Section 4.22.

Finally, Öhlschläger’s claim is not compatible with the findings of the corpus analysis conducted by Coates (1983: 243). She shows that epistemic modal auxiliaries are typically stressed, in contrast to their non-epistemic counterparts. In a similar vein, Leech (1971: 68) argues that epistemic *may* is normally stressed, whereas it remains unstressed in its permission reading.

4.10 Excluded from the scope of negation

In her corpus study on English, Coates (1983: 238) could not find any epistemic modal auxiliary in the scope of negation. In a similar manner, Leech (1971: 72) observes that epistemic *must* does not occur in the scope of negation. Inspired by these results and the characterisation of ‘objective’ epistemic modality by Ly-

ons (1977: 799), authors like Öhlschläger (1989: 207), Askedal (1997a: 63), Diewald (1999: 84) and Drubig (2001: 5) assume that ('subjective') epistemic modal verbs cannot be in the scope of a negative operator. Based on data from epistemic adverbs in Hungarian, Kiefer (1984: 71) concludes that, for Spanish, 'subjective' epistemic operators do not occur in the scope of negation. Hengeveld (1988: 237) concludes for Spanish that 'subjective' epistemic modal operators are excluded from the scope of negation whereas their 'objective' epistemic counterparts are possible in this type of environment. Again, it is no trivial matter to find out how negation would be interpreted when it takes scope over an epistemic modal verb. Lyons (1977: 802) suggests that every utterance consists of three components, each of which can be independently negated resulting in the following interpretations: (i) non-commitment 'I don't say that it is the case that *p*', (ii) 'I say that it is not the case that *p*, and (iii) context free assertion of a negative proposition 'I say that is the case that not-*p*. According to Lyons (1977: 804), 'subjective' epistemic modals are part of the first component. Following his assumptions, nothing excludes negation from targeting 'subjective' epistemic modal verbs, cf. Section 4.22 for more details. Yet, he does not make any explicit statement about this matter.⁷³

Adopting the ideas suggested by Lyons (1977: 801), Öhlschläger (1989: 208) demonstrates in some detail, on the basis of data from German, how 'subjective' epistemic modals and negation might interact, specifically, in the case of *können* and *müssen*. Similar observations have been made by Fritz (1997: 55).

(709) Der Angeklagte kann nicht der Täter sein.⁷⁴
 the accused can NEG the culprit be-INF

(i) # 'It is not the case that <I consider it possible that> the accused is the culprit'

(ii) ' <I consider it impossible that> the accused is the culprit'

In contrast to Lyons (1977), Öhlschläger (1989: 208) explicitly rules out readings in which the negation takes scope over the entire epistemically modified proposition. Assuming that the 'subjective' epistemic modal verb *kann* can be paraphrased as 'I consider it possible that *p*', its negation would express that it is not the case that the speaker assumes *p*, as is illustrated by paraphrase (i).⁷⁵ As pointed out by

⁷³ Indeed, Lyons (1977: 801) observes that both subjective and objective epistemic modal verbs can be negated. Yet, he does not explicitly point out whether negated 'subjective' epistemic modals are an instance of non-commitment. If he did, he would predict the wrong interpretation for example (709). It is not entirely clear how Lyons (1977) would deal with these cases.

⁷⁴ The acceptability judgements reflect those found in Öhlschläger (1989: 208).

⁷⁵ Yet, it is not entirely clear whether Öhlschläger's paraphrase is felicitous. Similar paraphrases have been suggested by Coates (1983: 238) for epistemic *must* ('I infer that it is the case that ...not'); and by Sweetser (1990: 60) for epistemic *must* and for epistemic *may* ('The available

Öhlschläger (1989: 208), however, there are exceptional cases in which subjective epistemic *können* occurs with a matrix negation. But, as he further stresses the negation involved in these patterns cannot be regarded as a canonical matrix negation but rather as a ‘morphological negation’ conveying the interpretation illustrated in (ii). A similar explanation has been proposed by Huitink (2008: Sect. 3.3).⁷⁶

It merits closer attention that epistemic possibility modal verbs in the scope of negation, as in (709), typically involve a marked intonation pattern, Blühdorn (2012: Section 9.2) makes a similar observation. In most cases, they will bear a high pitch accent, which is reminiscent of contrastive focus, as has been illustrated by Selkirk (1984: 207) and Jacobs (1988: 114). In contrast to clauses that contain epistemic modal verbs without a negation, sentences like (709) cannot be uttered out of the blue. They usually require that the preceding discourse concerns the Question under Discussion, whether or not the accused could be the culprit.

As a consequence, it becomes evident that some kind of contrastive focus is involved. This is on par with Jacobs (1988: 94), who pointed out that negation is a focus sensitive operator. But which element exactly is contrasted? The predicate? The modal force of the operator? If the predicate were indeed focused, it would be expected that (710b) is a felicitous resumption of (710a), which stresses the impossibility of the modified proposition.

- (710) a. Der Angeklagte kann nicht der Täter sein...
 the accused can NEG the culprit be-INF
- b. # ...sondern er muss/soll/will der Täter sein.
 but he must/shall/wants the culprit be-INF
- Intended: ‘The accused cannot be the culprit but he must/shall/wants to be the culprit.

Indeed, the complex sentence is acceptable, but only if the contrastive focus in example (710a) is interpreted in a rather unusual way. Most commonly, the speaker would use a high pitch accent on *kann* to stress the impossibility of the proposition. Similar observations have been made by Coates (1983: 102), who has pointed out in her corpus study on English that epistemic *can’t* always receives either nuclear stress or onset. However, by uttering (710a), the speaker indicates that he does not

(direct) evidence compels me to conclude that’ and ‘I am not barred by my premises from the conclusion that’.

⁷⁶ Furthermore, Öhlschläger (1989: 88, 208) argues that epistemic *dürfte* can occur in the scope of negation, too. However, he uses data that is not uncontroversial, as will be demonstrated in the remainder of this section.

consider an epistemic possibility modal verb appropriate. Instead, he suggests an item that makes an even stronger commitment to the truth of the proposition under discussion.

In a similar way, it cannot be the modal force that is contrasted, as otherwise *muss* should be a felicitous alternative. It seems, then, that once more a phenomenon related to VERUM is involved here. As already discussed above, it seems likely that what is in focus is the knowledge or the modal base. This becomes particularly clear if the epistemically modified utterance is compared with its counterpart that does not contain an epistemic operator:

- (711) Der Angeklagte ist nicht der Täter.
 the accused is NEG the culprit

In this case, the speaker asserts that in the actual world the accused is not the culprit, thereby refuting some prior claim that the accused is the culprit. In doing so, he makes a commitment to the truth that the uttered proposition is true. As the speaker knows that the accused is the culprit, it follows that the accused is the culprit in all possible worlds that are consistent with his knowledge – in all possible worlds of the epistemic modal base. By contrast, a speaker who employs a focused epistemic possibility modal verb in the scope of negation does not make a commitment to the truth. Yet, he signals that the prior claim that the accused is the culprit is in conflict with all of the possible worlds that are consistent with his knowledge. The only difference to the case without epistemic modal verb (cf. 711) is that he does not anchor the proposition to the actual world.

That this epistemic *can* in the scope of negation involves some sort of contrastive focus is further supported by an observation made by Lyons (1977: 801). As he points out, the subjective epistemic possibility modal *can* allows for double negation.

- (712) It can't not be raining.

Utterances as the one in example (712) are only felicitous in conversations in which in prior discourse some participant has claimed that it was not raining. Once again, it becomes evident that contrastive focus is involved. This may explain why Coates (1983: 102) could document epistemic *can't* in her corpus.

Apart from epistemic *können*, at least one further epistemic modal verb in German can occur in the scope of negation: *müssen*, which, interestingly, behaves in a completely different way. Most importantly, it seems to prefer a low pitch accent followed by a high tone on the subsequent constituent. Therefore, it is possible to utter sentences such as in example (713a) out of the blue. Obviously, no contrastive focus needs to be involved.

- (713) a. Der Angeklagte muss nicht der Täter sein...
 the accused must NEG the culprit be-INF
- b. ... er kann/#will allenfalls der Täter sein.
 he can/wants the culprit at.best be-INF
- (i) # 'It is not the case that <I consider it certain that> the accused is the culprit, at best he could be.'
- (ii) '<I consider it uncertain whether> the accused is the culprit, at best he could be.'

Once again, it remains to be determined what precisely is in the scope of negation. As is indicated in the paraphrase, the negative operator in (713) is not an instance of non-commitment. Rather, it seems to be some sort of what Öhlschläger (1989: 208) calls 'morphological negation', a negation that only takes scope over the lexical item. An analogous reasoning applies to the rare cases of epistemic *brauchen*. Being a negative polarity item, it is restricted to environments in which it appears in the scope of a negative operator. As has been illustrated in Section 2.2.9, there are very few instances of *brauchen* in the DeReKo corpus that exhibit an epistemic interpretation, recall examples (431) and (432), here repeated as (714) and (715).

- (714) Was den Ort Xanten als Ort der Sage betrifft, so ist
 what the village Xanten as location the-GEN myth concerns so is
 Norbert Lönnendonker der Auffassung, dass das Santen
 Norbert Lönnendonker the-GEN opinion that the Santen
 des Nibelungenliedes nicht am Niederrhein gelegen zu
 the-GEN Nibelungenlied-GEN NEG at.the Lower.Rhine lie-PPP to
 haben braucht⁷⁷
 have-INF needs

'As for Xanten as the location of the myth, Norbert Lönnendonker believes that the village Santen appearing in the Nibelungenlied was not necessarily located at the Lower Rhine.'

- (715) Wir haben die Telekom längst gebeten, vor Ort
 We have the Telekom long.ago asked at place
 nachzusehen. Das braucht Herr Kunz gar nicht gemerkt zu
 after.to.look-INF this need Mister Kunz INTN NEG notice-PPP to
 haben, weil der Techniker dafür nicht unbedingt
 have-INF because the technician therefore NEG necessarily
 ins Haus muss⁷⁸
 into.the house must

⁷⁷ DeReKo:WPD/SSS.10575, Wikipedia – URL:<http://de.wikipedia.org>: Wikipedia, 2005.

‘We already asked the Telekom company to check his connection long ago. Mister Kunz does not have to have necessarily noticed it because the technician does not need to enter the house to do so.’

Furthermore, Öhlschläger (1989: 88, 208) claims that epistemic *dürfte* can be interpreted in the scope of negation as well. According to his perspective, example (716) can have the two interpretations indicated below.

- (716) Die Aktienkurse dürften nicht steigen.
 the stock.prices may NEG rise-INF
- a. It is likely to be the case that the stock prices do not rise. [translation by JM]
 - b. It is not the case that it is likely that the stock prices do not rise. [translation by JM]

As the state of affairs described by the two alternatives ‘it is likely that not’ and ‘it is unlikely that’ is fairly similar, it is not easy to provide a context in which only the wide scope interpretation (cf. 716b) is acceptable. Such a reading could become more plausible if *dürfte* is assigned a high pitch accent and gets contrastive focus. Based on an analysis that treats *dürfte* as an evidential, one could argue that the contrastive focus on the modal verb with negation indicates that there is no evidence that the embedded proposition is true – in opposition to what somebody else has claimed. Imagine a discourse to which the following utterance has been added: ‘The analyst has argued that it is likely that the stock prices will rise.’ This is a situation in which example (716) should be acceptable, according to Öhlschläger’s expectation. Possibly, bearing a high pitch accent indicating some sort of (VERUM) focus. Yet, the individual judgements differ in the extent to which such an option is available. Unless such examples are thoroughly attested in corpora, it is not justified to assume that *dürfte* can occur in the scope of negation. In any case, the wide scope reading of a negation is by far much more natural with the epistemic forms of *können* and *müssen*. As for epistemic *dürfte*, it remains to be demonstrated that it indeed does occur in the scope of negation.

Thus, the behaviour of the epistemic modal in the scope of negation can be captured and formalised assuming that modal operators are composites consisting of several components, as suggested by Kratzer (1981: 42) and Kratzer (1991: 649): a modal force (possibility/ \diamond , necessity/ \square) and conversational backgrounds. Upon closer inspection, it turns out that what is negated in example (713a) is only the modal force, rather than the entire epistemic modal operator.

78 DeReKo:NUN06/NOV.02580 Nürnberger Nachrichten, 23/11/2006.

It deserves closer attention that the negation of the modal force with epistemic modal verbs is only available with the indicative forms of *können* and *müssen* (and, rarely, also with *brauchen*). Once they are replaced with their subjunctive correlates, an interpretation in which the negation bears scope over the modal force becomes excluded. As a pitch accent on a modal verb usually triggers a wide scope reading, the interpretation of examples (717) and (719) becomes somewhat awkward. A more detailed discussion is given in Section 2.2.1 and Section 2.2.2.

- (717) # Der Angeklagte könnte nicht der Täter sein...
 the accused can-SBJV.PST NEG the culprit be-INF
- (718) # Der Angeklagte müsste nicht der Täter sein...
 the accused must-SBJV.PST NEG the culprit be-INF
- (719) # Der Angeklagte bräuchte nicht der Täter (zu) sein...
 the accused need-SBJV.PST NEG the culprit to be-INF

Differences between epistemic \diamond and \square can also be found in English. As Butler (2003: 984) and Lyons (1977: 801) argue, only epistemic *can* is possible in the scope of negation, while epistemic necessity modals such as *must* are not.⁷⁹ But then, Moscati (2006: 31) argues that, under particular conditions, the epistemic necessity modal verb *need* also allows for a matrix negation, which obviously behaves in a similar fashion to *müssen* in German. Likewise, Fintel and Iatridou (2003: 184) and Papafragou (2006: 1694) demonstrate that some true ('subjective') epistemic modals in English can occur in the scope of negation, such as the possibility modal *can* and the necessity modal *need*. Furthermore, Fintel and Gillies (2010: 357) show that this extends to the epistemic interpretations of the English necessity modal *have to* and the German necessity modals *müssen* and *brauchen*. Finally, Homer (2010: Sect. 3.1) has demonstrated that the epistemic possibility modal verb in French *pouvoir* 'could' regularly occurs in the scope of negation.

This leaves us with the question of why it is in particular epistemic possibility modal verbs that occur within the scope of a negative operator. As is evident, negated possibility modal verbs are an efficient means to contradict propositions that have been stated in prior discourse. They categorically rule out the truth of the modified proposition.

⁷⁹ Lyons (1977: 801) further concludes that the compatibility of epistemic *can* with double negation indicates that epistemic possibility modal verbs in English are generally more 'basic' than their counterparts that encode epistemic necessity. This conclusion lacks plausibility, since it is *can*, of all modal auxiliaries, which fails to be interpreted epistemically in the absence of a negative context, as has been frequently observed, cf. Hofmann (1976: 94), Sweetser (1990: 62), Brennan (1993: 14) and Drubig (2001: 43).

Finally, there remains one problem to be solved. There are some contexts in which the *Condition on Deictic Centres* (CoDeC) does not seem to apply. The speaker who utters the sentence in example (720) should implicitly know that the addressee has not seen him at the place under discussion.

- (720) Du kannst mich hier noch nie gesehen haben, ich bin zum
 you can me here already never see-PPP have-INF I am to
 ersten Mal in dieser Stadt.
 first time in this town
 ‘You can’t have seen me here before since it is the first time that I have been in this town.’

It is plausible to argue that the speaker is indeed aware of the truth value of the modified proposition, hence refuting the CoDeC. Yet, there are some loopholes, which make it possible to rescue the CoDeC. First of all, it needs to be investigated to what extent contrastive VERUM focus has an impact on epistemic modifiers. Possibly, the CoDeC only has to apply to the underlying utterance, which does not contain contrastive VERUM focus. It is conceivable that contrastive VERUM focus alters the conditions for the use of epistemic modifiers. Secondly, if the speaker alternatively utters the plain sentence without a possibility modal, he expresses a much stronger commitment to the truth: ‘Du hast mich hier noch nicht gesehen’ (‘You haven’t seen me here’). If the speaker explicitly knows the truth value of the proposition under discussion, he is rather expected to invoke a sentence without a modal verb, following the Gricean Maxim of Quantity. Thirdly, recall that not every possibility modal verb needs to be an epistemic one. In particular, *können* allows for practical possibility or quantificational readings. Correspondingly, among all cases of negated *können*, there are also instances of circumstantial (practical possibility, quantificational) interpretations. In contrast, whenever epistemic *müssen* occurs in the scope of negation, the CoDeC remains unaffected. This possibly indicates that it is VERUM focus what affects the condition on the use of epistemic modifiers.

Finally, it also becomes clear how the paradox observed by Westmoreland (1998: 8) can be accounted for. As he remarks, epistemic possibility and necessity modal verbs in English cannot be defined in terms of each other. He argues that *not* ($can_{epist}P$) is not equivalent to *must*_{epist} (*not* (p)) in natural language, hence contradicting basic assumptions of classical modal logic. However, the fact that epistemic *can* in the scope of negation and *must* do not behave identically should not be surprising, as they drastically differ in which contexts they can be used: Whereas negated *can* typically bears VERUM focus (or a related sort of phenomenon) epistemic *must* does not.

As it seems, even ‘subjective’ epistemic modal verbs can be affected by negation in the case of *können*, *müssen* and *brauchen*. However, it is not the entire modal operator that is in the scope of negation; rather, only components are concerned, such as the modal force or modal base – a similar effect can be seen with the circumstantial use of *sollen*, cf. Section 2.2.6. In opposition, the remaining epistemic modal verbs, *könnte*, *müsste*, *dürfte*, *mögen*, *sollte* and *werden* are not attested in the scope of a negative operator at all.

4.11 Excluded from polarity questions

As pointed out by Jackendoff (1972: 103), modal auxiliaries in English disfavour an epistemic interpretation whenever they are embedded in polarity questions.

(721) Must/Should/May Max leave?

Yet, he does not explicitly exclude an epistemic interpretation for (721). In a similar fashion, Leech (1971: 68, 72, 85) observes that epistemic *may* and *must* do not occur in questions, whereas epistemic *can* does. Lyons (1977: 799) assumes that ‘objective’ epistemic modal operators may occur in questions. Following this line of reasoning, Aijmer (1978: 164), McDowell (1987: 235), Hengeveld (1988: 236), Cinque (1999: 86) and Drubig (2001: 10) argue that ‘subjective’ epistemic modal verbs are generally banned from polarity question by means of their restriction to non-assertive contexts. As they stress, questions containing an epistemic modal verb can never be interpreted as a request for the truth value of a proposition, since according to them, the epistemic modal operator is always external to the proposition. Nevertheless, Drubig (2001: 12) and Papafragou (2006: 1698) concede that a (‘subjective’) epistemic interpretation becomes available in deliberative, self-addressed question. Based on data from epistemic adverbs in Hungarian, Kiefer (1984: 71) likewise concludes that ‘subjective’ epistemic operators are excluded from questions. In a similar vein, Watts (1984: 133) argues that polarity questions can only host ‘objective’ epistemic verbs. In his discussion, Lyons (1977: 796, 799, 803) suggests that ‘subjective’ epistemic modal operators and question operators compete for the same position in the structural representation of an utterance. This could imply that they are incompatible, but Lyons (1977) is not explicit about that issue. Coates (1983: 242) has conducted a corpus study for English that failed to record a canonical epistemic modal auxiliary embedded in a question. Based on these results, Nuyts (2001a: 210) assumes that ‘subjective’ epistemic modal verbs do not occur in questions in German and Dutch.

Yet, there are clear cases of information seeking questions which contain a potentially epistemic modal verb that cannot be interpreted as deliberative ques-

tion. A small corpus study has provided a couple of occurrences for *können* (cf. 722–723) and *könnte* (cf. 724) that are part of an interview or some other sort of dialogue. Such an environment ensures that the questions are indeed information seeking questions, rather than deliberative self-addressed ones. Moreover, an instance of *dürfte* could be found taken from a letter to the editor, in which a reader of a newspaper asks the editor about the cover image, as is illustrated in example (725).

- (722) a. „Kann das Glas schon länger, also beispielsweise zwei
Can the glass already longer thus for.example two
Monate, gestanden haben?“
month stand have
- b. „Die Wohnung sah so aus, als würde sie
the flat looked so out as.if pass.aux-sbjv.pst she
benutzt“, erwiderte der Zeuge.⁸⁰
used responded the witness
'[lawyer:] "Could the glass have already stood there for two months?"
witness: "The flat looked liked it was used." '
- (723) a. „Kann das mit dem Unterarm so gewesen sein?“, setzt
can this with the lower.arm so be be-INF set
Knieriem nach
Knieriem after
- b. „Ich will es nicht ausschließen“, sagt Yükel.⁸¹
I want it NEG exclude-INF says Yükel
' "Could it have been like this, regarding the lower arm?", Knieriem continues.
"I cannot exclude it" Yükel says.'
- (724) a. Die Kriminalpolizei fragt nun: [...] Könnte
the criminal.investigation.department asks now could
es ein Fluchtfahrzeug gegeben haben?
EXPL a get.away.vehicle give-PPP have-INF
- b. Dazu konnte die eingesperrte Frau keine Angaben
there.to could the jailed woman no statement
machen.⁸²
make-INF
'Criminal Investigation Department: "Could there have been a get away car?"
The jailed woman could not make any statement about this.'

80 DeReKo: RHZ08/JUN.01066 Rhein-Zeitung, 02/06/2008.

81 DeReKo: BRZ06/FEB.03571 Braunschweiger Zeitung, 07/02/2006.

82 DeReKo: RHZ09/OKT.09470 Rhein-Zeitung, 10/10/2009.

- (725) Dürfte sich beim Titelbild eine seitenverkehrte Abbildung
 may REFL at.the cover.image a reversed image
 eingeschlichen haben?⁸³
 slip.in-PPP have-INF
 ‘May a reversed image have slipped onto the cover?’

Furthermore, *sollte* could frequently be found in questions. Yet, all of these occurrences seem to involve deliberative questions or contexts in which a deliberative interpretation cannot be excluded, as is shown in examples (726) and (727). There is hardly one example in which epistemic *sollte* is embedded in a question that is explicitly used as a information seeking question. But this does not necessarily indicate that epistemic *sollte* is completely ruled out in such environments:

- (726) Sollte das in Berlin wirklich unbekannt sein?⁸⁴
 shall-SBJV.PST this in Berlin indeed unknown be-INF
 ‘Is it really likely that nobody knows about that in Berlin?’
- (727) Sollte da was schiefgelaufen sein?⁸⁵
 should there something wrong.go-PPP be-INF
 ‘Is it likely that something went wrong?’

By contrast, *müssen* does not appear to be easily compatible with information seeking questions. Two potential occurrences could be found, both of them seem to be rather specific.

- (728) a. „[...] Möglicherweise ist der Gedanke erlaubt, nach anderen
 possibly is the thought permitted for other
 Lösungen zu suchen. Muss sich der Vorgang, so könnte
 solutions to search-INF must REFL the incident so could
 man überlegen, denn tatsächlich so abgespielt haben?“
 one thing PART indeed so happen-PPP have-INF
- b. „Und?“, fragte einer der Anwälte. „Was schwebt Ihnen
 and asked a the-GEN lawyers what impend you
 denn vor?“⁸⁶
 PART before
 ‘ “Possibly, it is admitted to look for other solutions. Is it certain, one could assume, that the incident happened in that particular way? ”
 “So what?” one of the lawyers asked “What do you have in mind?” ’

⁸³ DeReKo: P97/MAI.19678 Die Presse, 24/05/1997, Ressort: Spectrum/Tribüne der Leser; Die Garde sorgte für Rätsel.

⁸⁴ DeReKo: BRZ10/SEP.04667 Braunschweiger Zeitung, 16/09/2010.

⁸⁵ DeReKo: R98/MAI.40976 Frankfurter Rundschau, 23/05/1998.

⁸⁶ DeReKo: DIV/DSP.00001 Scholz, Dietmar: Poldi. – Föritz, 2004 [S. 235].

- (729) a. Müsste es nicht ein Traum sein, ein
 must-SBJV.PST it NEG a dream be-INF a
 englisch-deutsches Fahrergespann in einem
 English-German driver.duo in a
 englisch-deutschen Team zu haben?
 English-German team to have-INF
- b. Haug: Alle dürfen gerne von Traumbesetzungen
 all may willingly about dream.casts
 träumen, Phantasien gehören in der Formel 1 dazu, und
 dream-INF phantasies belong in the Formula 1 to.it and
 Träume werden dort gelegentlich auch durchaus wahr.⁸⁷
 dreams become there occasionally also definitely true
 '[journalist:] "Wouldn't it be a dream to have an English-German driver duo in
 an English German Team?"
 Haug: "Everybody may have dreams about dream casts, fantasy is a part of For-
 mula 1 and occasionally these dreams definitely become true. "'

First of all, *muss* in example (728) requires a contrastive focus stress and presupposes that one of the discourse participants considers the modified proposition as true or certain. Likewise, the second occurrence (cf. 729) underlies very particular discourse conditions. It is embedded in a question that contains a negation. In this distribution, the negative operator contributes an interesting pragmatic effect. It signals that the speaker expects the addressee to accept and confirm the proposition *p* under discussion = {'It must be a dream to have an English-German driving team.'}. In this respect, this question resembles a tag question in English. Since this type of question differs from canonical information seeking questions in crucial respects, it will not receive any further attention in the upcoming section.

In a similar vein, Hacquard and Wellwood (2012: 8, 21) have pointed out that the English epistemic possibility verb *might* is attested in information seeking polarity question. As they observe, the necessity verb *must* is significantly less common in such environments. This contrast is reflected by the behaviour of epistemic *might* and *must* in embedded information seeking questions. As Hacquard and Wellwood (2012: 9) show, the epistemic possibility verb is documented 1.367 times under inquisitive predicates such as *ask*, whereas the epistemic necessity verb is only attested 19 times.

Once again, it is no trivial matter to decide what the interpretation of a canonical information seeking question that contains an epistemic operator would

⁸⁷ DeReKo: NUN07/OKT.03081 Nürnberger Nachrichten, 18/10/2007.

be. As shown above, it is reasonable to consider modal operators as composites which consist of at least two sub parts: modal base and modal force. Accordingly, the question operator could interact with three different entities: either the knowledge (modal base), the strength of the assumption (modal force) or the validity of the entire assumption. Given the fact that epistemic modal verbs are interpreted with respect to the knowledge of the deictic centre, which is usually represented by the speaker, it is necessary to include the speaker in the paraphrase.

Which of these options provides the appropriate interpretation of the examples given above? Since the transliterations for epistemic modality suggested by Öhlschläger (1989: 208) and Sweetser (1990: 60) are not detailed enough, and since there is good evidence that modal operators consist of several components, a paraphrase in the spirit of Kratzer (1981) seems to be the most adequate solution. Bearing in mind that the deictic centre is typically the speaker, example (730) should be the corresponding circumscription of example (724):

(730) Given my knowledge, is it true that, in some of the worlds that are consistent with my knowledge, there was a get away car?

However, this is certainly not what the police man uttering (724) had in mind. From a pragmatic perspective, questions like example (730) do not make sense, since there are hardly situations in which the addressee knows more about the speaker's knowledge than the speaker himself. Why should the speaker ask the addressee a question that seeks for the validity of a relation with respect to his own knowledge? Hence, questions like the one illustrated in (730) only make sense if they are self-directed, deliberative question. For this reason, it is often assumed that epistemic modal verbs are not compatible with information seeking questions.

However, assuming that questions containing epistemic modal operators induce a context shift in which the deictic centre is identified with the addressee, an appropriate interpretation is yielded.

(731) Given your knowledge, is it true that, in some of the worlds that are consistent with your knowledge, there was a get away car?

In order to find out what the precise semantic contribution of the epistemic operator in a polarity question is, it might be fruitful to take a look at the same question without the epistemic operator. As it turns out, the two questions differ in one major aspect. Asking a plain question such as 'Hat es ein Fluchtfahrzeug gegeben?' ('Was there a get away car?'), the speaker indicates that he expects the addressee to know the truth value of the proposition in question. In contrast to that, a speaker who utters the very same question including an epistemic operator conveys that he does not expect the addressee to know the truth value of the

proposition under discussion. This conforms exactly to the *Condition on Deictic Centres* (CoDeC) formulated in section 2.1.3.3: The deictic centre, in this particular case instantiated by the hearer, does not know whether the modified proposition does indeed hold.

In a similar fashion, Brennan (1993: 24) has already observed that epistemic modal verbs may occur in polarity and *wh*-questions under particular conditions. As she notices, they become acceptable whenever the speaker and the hearer share the same background knowledge, which is necessary to evaluate the epistemic modal verb. She therefore concludes that these are instances of ‘objective’ epistemic modality in the spirit of Lyons (1977). But unfortunately, Lyons (1977: 798) is not explicit with respect to what exactly an ‘objective’ epistemic modal verb denotes. He only remarks that an objective epistemic modal verb encodes Lyon’s speaker’s knowledge about the possibility of a state of affairs, rather than his mere assumption that this state of affairs is true. Obviously, what Lyons (1977) had in mind conforms to the semantic descriptions suggested by Öhlschläger (1989: 192), who meticulously adopts the original approach of the distinction between ‘objective’ and ‘subjective’ modality. According to Öhlschläger (1989), the ‘objective’ epistemic modal verb *können* indicates that the state of affairs expressed by the modified IP is consistent with the evidence. In contrast, Öhlschläger (1989: 207) assumes that its ‘subjective’ epistemic counterpart conveys that the speaker considers it possible that the state of affairs expressed by the IP is true. But then the question arises: Whose evidence exactly is it? As it seems, the evidence is at least available to the speaker and the hearer. From the assumptions defended by Öhlschläger (1989: 192), it follows that everybody to whom the evidence is accessible should know that the modified state of affairs is generally possible. Accordingly, a paraphrase for a question that embeds an objective epistemic *können* in the spirit of Öhlschläger (1989) could look like (732):

- (732) Given the evidence/ your and my knowledge about the evidence, is it true that in some of the worlds that are consistent with the evidence there was a get away car?

If the speaker and hearer both already know that this state of affair is possible, for what reason should the speaker then ask at all? If Öhlschläger’s definition is straightforward, the situation is expected to be similar to ‘subjective’ epistemic modal verbs in self-addressed deliberative questions, in which the speaker asks himself a question based on his own individual knowledge. Since the evidence enables both the hearer and the speaker to arrive at the same conclusion, the speaker would ask a question to which he should already know the answer. As a consequence, questions that contain an (‘objective’) epistemic modal verb should convey a deliberative effect. But this is clearly not the case in examples (722) and

(724), which both behave like canonical information seeking questions. Rather, the paraphrase in example (731) seems to be more appropriate, in which the speaker asks the addressee whether the state of affairs is consistent with his knowledge. Hence, it is reasonable to conclude that question operators take scope over epistemic modal operators inducing a context shift, in which the deictic centre is moved from the speaker to the addressee. This is reminiscent of the behaviour of the modal source of deontic necessity modals, as has been pointed out by Leech (1971: 72), Depraetere and Verhulst (2008: 11): Whereas the modal source (which roughly corresponds to the referent referred to as ‘deictic centre’ here) typically tends to be identified with the speaker in declarative clauses, it is rather identified with the addressee in questions and antecedents of conditionals. In a similar fashion, Doherty (1985: 19) argues that the speech act type determines how the attitude holder is identified: Whereas the attitude holder is the speaker in assertions, it remains under-specified in questions.

Likewise, Lasersohn (2005: 674) observed an analogous pattern of context and perspective shift with predicates of personal taste, such as *fun*. Just like epistemic modal operators, predicates of personal taste are evaluated with respect to a “judge” or deictic centre, which is identified with the speaker in the canonical case. Lasersohn (2005: 673) argues that a speaker usually asserts from an auto-centric perspective, in which the deictic centre is anchored to the speaker. Based on a Hamblin-style analysis of questions, he assumes that a speaker who utters a question sets up a space of possible answers and invites the addressee to assert one of the alternatives. Lasersohn further argues that the deictic centre is most typically identical with the asserting instance. Since the asserting instance in questions is the addressee rather than the speaker, question operators induce an exocentric perspective in the case of canonical information seeking questions.

Interestingly, this sort of context shift with epistemic modal verbs does not apply to questions that contain negations which are interpreted in a suggestive manner, as in example (729) given above: The holder of the attitude remains identical with the speaker. The addressee is only requested to confirm the proposition as it is assumed by the speaker.

An account that analyses epistemic modal verbs in question as evidentials faces additional difficulties, since it would predict evidential modifiers to be significantly better than epistemic ones. But as has been pointed out by Jackendoff (1972: 84), the evidential adverbials in questions turn out to be as unacceptable as epistemic ones. Finally, it turns out that an approach based on objective epistemic modality does not account for the actual interpretation of epistemic modal verbs. Finally, all of the problematic examples discussed by Brennan (1993: 24) can be explained by a theory based on the assumption that question operators induce context shift for epistemic operators. Such an approach is further supported by

the fact that in German other epistemic modifiers occur in polarity questions as well, such as the epistemic adverbials *womöglich* ‘perhaps’ and *vielleicht* ‘maybe’, but also *vermutlich* ‘presumably’ cf. following examples (733) and (734) from the DeReKo corpus:

- (733) Hat es vielleicht/womöglich ein Fluchtfahrzeug gegeben?
Has it perhaps/maybe a get.away.vehicle give-PPP
‘Is it consistent with your knowledge that there was a get away vehicle?’
- (734) a. Hat Generalmajor von Tresckow also vermutlich davon
has Generalmajor von Tresckow thus presumably about
gewußt, was im hinteren Bereich seiner Heeresgruppe
know-PPP what in.the back division his-GEN army.group
unter dem Stichwort Partisanenbekämpfung vor sich ging?
under the keyword partisan.combat before REFL went
- b. Mommsen: Ja, und zur selben Zeit haben er und seine
yes and at.the same time have he and his
Parteigänger im Widerstand in den Stäben an den
colleagues in.the resistance at the staffs on the
Attentatsplänen gegen Hitler geschmiedet.⁸⁸
assassination.plans against Hitler forged
‘ [journalist:] “(According to your assumptions) Did Generalmajor von Tresckow
(presumably) know what happened in the back divisions of his army when they
executed their “combat against partisans”?’ ”
Mommsen: “Yes, at the same time he made plans together with his partisans in
the resistance to assassinate Hitler.” ’

Dietrich (1992: 72) provides independent evidence that epistemic adverbials occur in questions as well as in directive speech acts:

- (735) Fährst Du auch bestimmt nach Paris?
Go you also certainly to Paris
‘Are you certain that you will go to Paris?’
- (736) Kommst Du vielleicht nach Paris?
Come you maybe to Paris
‘Do you think you come to Paris?’

Zimmermann (2004: 263) observes a related phenomenon regarding the discourse particle *wohl*, which canonically marks the modified utterance as a hypothesis by the speaker. Analogously to epistemic modal verbs, they occur in questions.

⁸⁸ DeReKo: P98/FEB.05580 Die Presse, 07/02/1998.

Though *wohl* differs in its behaviour from epistemic modal verbs in some respect, it shares at least one crucial property with them. As soon as it is embedded in a question, a context shift is induced, in which the deictic centre is identified with the addressee.⁸⁹

(737) Ist Hein wohl auf See?
Is Hein wohl at sea

‘Tell me your assumption concerning Hein’s being at sea or his not being at sea: Is he at sea or not?’

Finally, we should keep in mind that the different readings of *können* are hard to disambiguate. This concerns in particular practical possibility and quantificational readings. So the question arises whether the instances of *können* in the questions discussed so far could not be analysed as quantificational or practical possibility modal verbs. And indeed, declarative clauses that contain a quantificational modal verb have a counterpart with properties of a polarity question: *Can a basketball player be small?* Returning to the examples given above, none of them have a declarative counterpart that exhibits a quantificational interpretation. In a similar fashion, their declarative counterparts cannot be interpreted as practical possibility modal verbs. Finally, polarity questions that contain *könnte* or possibility adverbials like *womöglich* and *vielleicht* indicate that true epistemic modal verbs should be possible since these particular lexical items typically lack a quantificational interpretation or a practical possibility one.

To conclude, epistemic modal verbs are generally compatible with information seeking polarity questions. At least three of them are attested in the DeReKo corpus: *kann*, *könnte* and *dürfte*. Interestingly, necessity modals such as *müssen* can hardly be found in these contexts. This is unexpected for an account that is based on the assumption that all of the epistemic modal verbs in questions are objective epistemic modal verbs, as in these approaches *müssen* is a prototypical objective epistemic modal verb. Rather, the restriction for epistemic operators in questions might be due to pragmatic reasons. There seem to be less scenarios in

⁸⁹ Strictly speaking, Zimmermann (2004: 264) argues that the discourse particle *wohl* and epistemic modal verbs behave quite differently in questions. His assumptions are based on the observation that epistemic *müssen* can occur in the scope of negation. His example may not be well chosen though. As has been demonstrated in Section 4.10, there is only a small subset of the epistemic modal verbs in German that can occur in the scope of negation. Thus, this property cannot be considered as essential or decisive. Furthermore, what is negated is not the entire epistemic operator but just its modal force. As has been demonstrated, an operator can at the same time interact with a negation and exhibit an epistemic interpretation. Accordingly, Zimmermann’s observation does not contradict an analysis that treats *wohl* and epistemic modal verbs in a parallel way, at least in the essential points.

which it makes sense to ask the addressee about his state of affairs, which he considers as certain. Crucially, a polarity question operator will induce a context shift for the epistemic modal operator, which identifies the deictic centre with the addressee. In canonical information seeking questions, the deictic centre is represented by the addressee. In particular contexts, the speaker and the addressee are identical. In these cases, the deictic centre will be assigned to the speaker providing a deliberative interpretation.

4.12 Excluded from *wh*-questions

In his analysis, Jackendoff (1972: 102) assumes that epistemic modal auxiliaries in English, being poorly inflected, have to be analysed in the same way as sentence adverbs. At an earlier point, Jackendoff (1972: 84) observed that sentence adverbs in English do not “feel comfortable” in any context in which subject auxiliary inversion applies, such as polarity questions and *wh*-questions. Crucially, he does not relate the incompatibility of epistemic modal operators to the semantics of questions, but rather to the alignment of subject and auxiliary. Jackendoff’s arguments do not apply to German. Firstly, there is no evidence in German for a specific subject auxiliary inversion rule that uniquely applies to questions. Secondly, Jackendoff (1972: 100, Fn.5) acknowledges that German modals behave rather like main verbs. Therefore, an adverbial analysis for modal verbs in German would not be justified.

Based on the assumptions about objective epistemic modality made by Lyons (1977: 799), other authors, such as Cinque (1999: 86), Diewald (1999: 84), Drubig (2001: 11) and Axel (2001: 45), assume that ‘subjective’ epistemic modal verbs are restricted to assertive contexts. Likewise, McDowell (1987: 235) concludes that epistemic modal verbs are excluded from *wh*-questions for syntactic reasons. As Drubig (2001) argues, epistemic modal operators are always external to the proposition and therefore not affected if some other illocutionary force is applied. He concedes that epistemic modal operators in *wh*-questions are marginally acceptable if they are self-addressed. However, Fintel and Iatridou (2003: 180 Fn. 11) point out that Drubig’s examples are not well chosen, since they involve infinitive complements that do not combine easily with epistemic modal verbs. They conclude that epistemic modal verbs are acceptable in *wh*-questions.

In contrast to the claim advocated by Drubig (2001), clear instances of epistemic modal verbs can be found, embedded in information seeking *wh*-questions which are addressed to a person different from the speaker. These patterns are attested with *kann* (cf. 738), *könnte* (cf. 739) and *dürfte* (cf. 740–744). The

wh-morphology can be attached to an argument of the embedded infinitive (cf. 738–742) or to an adjunct (cf. 743 and 744):

- (738) a. „Wer kann Ihnen etwas ins Glas geworfen haben?“,
 who can you something into.the glass throw-POP have-INF
 fragte der Richter.
 asked the judge
- b. „Ich denke, es war dieser Bekannte“, erwiderte die Frau.⁹⁰
 I think it was that friend answered the woman
 ‘“Who could have thrown something in your glass?” , the judge asked.
 “I think it was this friend”, the woman answered.’
- (739) a. MOPO: Wer könnte die Fälschung der Wahl
 who could the fraud the-GEN election
 veranlasst haben?
 arrange-PPP have-INF
- b. Steinbach: Nur einer: Revolutionsführer Ajatollah Ali
 only one revolution.leader Ajatollah Ali
 Chamenei.⁹¹
 Chamenei
 ‘MOPO: “Who could have arranged the election fraud?”
 Steinbach: “Only one, the leader of the revolution Ajatollah Ali Chamenei.” ’
- (740) a. Wer dürfte für Martina im Jahr 2000 am gefährlichsten
 Who.NOM might for Martina in year 2000 at dangerous.SUP
 werden?
 get-INF?
- b. Martina, die Williams und Lindsay (Davenport) sind den
 Martina the Williams and Lindsay (Davenport) are the
 anderen weit voraus. Jetzt kommt es darauf an, wer am
 others way ahead now comes it of.it on who at
 meisten macht.⁹²
 most makes)
 ‘[journalist:] “Who do you think might be Martina’s main challengers in 2000?”
 [tennis player:] “Martina, Williams and Lindsay (Davenport) are way ahead. Now
 it depends on who is capable of doing the most.” ’

⁹⁰ DeReKo: BVZ07/FEB.00540 Burgenländische Volkszeitung, 07/02/2007.

⁹¹ DeReKo: HMP09/JUN.01442 Hamburger Morgenpost, 17/06/2009.

⁹² DeReKo: E99/OKT.27314 Zürcher Tagesanzeiger, 16/10/1999.

- (741) a. Wer dürfte künftig zu Ihren größten Widersachern
 who might in.future to your biggest opponent
 gehören?
 belong-INF
- b. In den Verbandsgremien hat man bisher über die
 in the federal.committees has one up.to.now across the
 Parteigrenzen hinweg sehr gut an einem Strang gezogen. Ich
 party.borders away very well at one string pulled I
 finde es positiv, dass man die Interessen der fünf
 find it positive that one the interest the-GEN five
 Landkreise und drei kreisfreien Städte zusammenbringt.⁹³
 land.district and three district.free cities together.brings
 ‘[journalist:] “Who might be your biggest opponents in the future?”
 [politician:] “In the federal committees, every one pulled together very well
 across parties. I consider it as a positive development that interests of the five
 rural districts and the three urban districts are brought together.” ’
- (742) a. Was dürfte bei diesem Unglück passiert sein?
 what.NOM might at that disaster happen-POP be-INF
- b. ZHUBER-OKROG: Ein Triebwerk hat zu brennen begonnen.
 a engine has to burn begun
 Der Brand kann viele Ursachen haben, ein Leck in der
 the fire can many causes have-INF a leak in the
 Kerosinzufuhr, alles Mögliche.⁹⁴
 kerosine.supply everything possible
 ‘[journalist:] “What do you think had happened at this disaster?”
 Zhuber-Okrog: “An engine caught fire. The fire can have several causes, a leak in
 the kerosin supply; a lot of things.” ’
- (743) a. MOPO am Sonntag: Wie lange dürfte es bis zu einer
 how long might it until to a
 deutschlandweit einheitlichen Regelung dauern?
 germany.wide uniform arrangement last-INF
- b. Scholz: Ich gehe davon aus, dass es einen schnellen
 I go there.of out that it a quick
 Gesetzgebungsprozess geben wird.⁹⁵
 legislation.procedure give will
 ‘MOPO am Sonntag: “How much time, do you think, would it take until a
 Germany-wide arrangement could be set up?”

⁹³ DeReKo: BRZ10/FEB.05727 Braunschweiger Zeitung, 12/02/2010.

⁹⁴ DeReKo: K00/JUL.55992 Kleine Zeitung, 27/07/2000.

Scholz: "I assume that the rapid legislation procedure will be short."'

(744) a. Wann dürfte die Stadt wieder finanziell Boden unter den
When might the city again financial ground under the
Füßen bekommen?
feet get-INF

b. LOHSE: Ohne eine große Gemeindefinanzreform wird
without a big municipality.finance.reform will
keine große Stadt wieder Boden unter den Füßen
no big city again ground under the feet
bekommen.⁹⁶

get-INF

'[journalist:] "When might the city resolve its financial problems?"

Lohse: "Without a big reform of the municipality's finances none of the big cities will get their feet back on the ground."'

All of these corpus examples are taken from dialogues, which clearly indicates that the questions involved are information-seeking. Asking a canonical *wh*-question, the speaker expects the addressee to be in a position to commit himself to one proposition among the set of the possible answers. If the *wh*-question contains an epistemic operator, the speaker does not expect the addressee to know the answer. Thus, he invites the addressee to indulge in speculation. Zimmermann (2004: 269) holds a similar view.

By contrast, the remaining epistemic modal verbs *mögen*, *wird*, *müssen* and *sollte* could not be found in information seeking questions in the DeReKo corpus. Most of them are attested in self-addressed, deliberative questions. The deliberative character of the question becomes most obvious in embedded contexts in which the super-ordinate predicate is a predicate of reflection, such as *denken* 'think' or *sich fragen* 'to ask oneself/wonder', rather than one used for interpersonal communication, such as *fragen* 'ask'.

(745) „Was mag aus ihnen wohl geworden sein?“, dachte sie⁹⁷
what may of them maybe become-PPP be-INF thought she
'"What might have become of them?" she thought.'

(746) „Du lieber Himmel, was mag ich nur angestellt haben?“, fragte
you dear sky what may I only PPP have-INF asked
sich die besorgte Neuwiederin.⁹⁸
REFL.PRN the worried Neuwiederian

95 DeReKo: MP06/DEZ.01607 Hamburger Morgenpost, 17/12/1006.

96 DeReKo: M03/DEZ.87511 Mannheimer Morgen, 30/12/1003.

97 DeReKo: M08/JAN.03521 Mannheimer Morgen, 15/01/2008.

‘ “Oh Goodness! What mischief could I have done?” the worried Neuwiederian wondered.’

Once again, epistemic *müssen* is far less frequent than the remaining epistemic modal verbs, even in deliberative questions. Only a couple of instances could be found, such as example (747). Interestingly, epistemic *müssen* seems to have occurred in questions much more frequently until the 18th century. As can be seen, all of the historical examples (748)–(750) are deliberative questions.

- (747) Was muss das blonde Mädchen in ihren letzten Minuten
 what must the blonde girl in her last minutes
 gedacht haben?⁹⁹
 think-PPP have-INF
 ‘ “What could the blonde girl have thought in her last minutes.”’
- (748) (Besieht ihn) Wahrhaftig, er ist erbrochen. Wer muß ihn denn
 look it indeed it is broken who must it PAR
 erbrochen haben?¹⁰⁰
 broken have
 ‘Somebody must have broken the seal, who could it be?’
- (749) Was muß es immer seyn / warum Scevin das thu?¹⁰¹
 what must it ever be-INF why Scevin that does
 ‘What could be the reason that caused Scevin to do this?’
- (750) wer musz uns diesen streich gespielt haben?¹⁰²
 who must us this trick play-PPP have-INF
 ‘Who could have played this trick on us?’

As was pointed out in the preceding section, epistemic necessity operators are not easily compatible with interrogative speech acts. Thus, it is not clear how the examples above should be interpreted. Arguably, the uses above could be a remnant of the original meaning in Old High German, when this verb referred to a possibility, rather than a necessity, as Bech (1951: 16) has illustrated. This view is confirmed by Adelung (1798: 332). As he observes, epistemic *müssen* in questions bears rather the meaning of *mögen*:¹⁰³

⁹⁸ DeReKo: RHZ06/NOV.17451 Rhein-Zeitung, 18/11/2006.

⁹⁹ DeReKo: HMP09/JAN.01337 Hamburger Morgenpost, 20/01/2009, Bäckereifahrer ließ Katrin (24) eigenes Grab schaufeln.

¹⁰⁰ Gotthold Ephraim Lessing, *Minna von Barnhelm*, 3, 10. (1767); translation by Curme (1922: 320).

¹⁰¹ Daniel Casper von Lohenstein, *Epicharis*, III 221. (1666).

¹⁰² As cited in Fritz (1997: 60): Adelung DWb 12, 2757 (1798).

4. [...] Ingleichen die Ungewißheit oder Unwissenheit zu bezeichnen, besonders in Fragen, da es denn für mögen stehet. Wie viel muß es wohl kosten? Ein jeder fragte, wer dieser Herr seyn müßte? Was muß der wollen? Wer muß uns diesen Streich gespielt haben? Ich weiß nicht, wer der seyn muß. Was muß das bedeuten?

In a similar fashion, Curme (1922: 320) translates the German necessity modal verb *müssen* in the *wh*-question with *could*, as is illustrated in the gloss of example (748).

The results of the corpus study carried out here largely correspond to the findings of Hacquard and Wellwood (2012: 8, 21), who have demonstrated that the epistemic possibility verb *might* is attested in information seeking *wh*-question, as opposed to its counterpart *must*, which expresses an epistemic necessity. The contrast remains the same in questions which are embedded under inquisitive predicates such as *ask*.

As it turns out, at least some of the epistemic modal verbs in German occur in information seeking questions. Recall that Brennan (1993: 24) made analogous observations for English. In a similar vein, Fritz (1997: 59) has pointed out for German that epistemic interpretations of modal verbs in *wh*-questions are marginally acceptable. As he further illustrates, these patterns obviously occurred more frequently in earlier stages of German.

In contrast, Cinque (1999: 86) argues that the modals in examples like those given by Brennan (1993: 24) have to be considered as practical possibility modal verbs, rather than epistemic ones. However, he fails to empirically justify his claim. As shown above, they clearly involve the addressee as a deictic centre.

Since *wh*-pronouns share some crucial features with indefinite pronouns, one could argue that the modal verbs embedded in the *wh*-questions discussed above are not epistemic, but rather quantificational modal verbs that bind a variable provided by the *wh*-pronoun. This reasoning faces some difficulties. Firstly, it has already been shown that there are modal verbs with clearly epistemic meaning that occur in polarity question which do not involve an indefinite or *wh*-pronoun at all. This illustrates that it cannot be the *wh*-pronoun that provides the specific possibility reading. Secondly, assuming that a question is derived from its declarative counterpart, it turns out that the matching equivalents for the questions (738)–(739) are clauses that contain epistemic modal verbs. An account based on the assumption that the modal verbs in the *wh*-questions above are quantificational

103 Likewise, [*müssen* is used] to refer to uncertainty or ignorance in particular in questions where it replaces *mögen* ('may'). How much must ('may') it cost? Everybody asked who this Sir must ('might') be? What must ('may') this one want? Who must ('may') have played this trick on us? I do not know who this must ('may') be. What must ('may') this mean? [translation J.M.]

fails to explain why they turn into epistemic ones in the corresponding declarative counterparts. Zimmermann (2004: 270) develops an analogous view for the discourse particle *wohl* ‘maybe’.

The conditions for epistemic modal verbs in *wh*-questions turn out to be analogous to the ones they underlie in polarity questions. Whenever an epistemic operator is embedded under a *wh*-operator, it will be subject to context shift, in which the deictic centre is identified with the addressee, rather than the speaker. In particular situations, the speaker and the addressee can be identical, as in self-addressed, deliberative questions.

Likewise, it has turned out that not all epistemic modal verbs are compatible to the same extent with information *wh*-questions. Whereas *kann*, *könnte* and *dürfte* are solidly attested in these contexts, the remaining items are not attested at all. The least compatible epistemic modal verb appears to be *müssen*, which is even almost never attested in deliberative questions. Once again, the situation here exactly reflects the situation with polarity questions. An approach that is based on the assumption that only ‘objective’ epistemic modal verbs are possible in questions could not account for the idiosyncratic behaviour of the different modal verbs. The restrictions of epistemic modal verbs in questions seem to derive from the interaction of individual properties of the respective verb and pragmatic factors.

4.13 Excluded from imperatives

As Aijmer (1978: 164) observes, epistemic modal auxiliaries in English are banned from imperatives. This is rather obvious, as modal verbs in German have not developed a proper imperative morphology, except for *wollen*. As was illustrated in Section 2.1.1.3, the canonical modal verbs in Germanic languages are considered as preterite presents, verbs that developed from preterite forms of strong verbs. After they were semantically reinterpreted as independent verb forms, they started to develop a paradigm of their own, including non-finite forms. But since all of the preterite presents involve semantic concepts that are hardly used in directive speech acts, these verbs have not developed imperative morphology at all. As a consequence, it is not surprising that epistemic modal verbs do not occur in imperatives. Finally, Aijmer’s (1978) observation is correct but it equally holds for any other interpretation with which a modal verb can occur.

4.14 Excluded from optatives

Scholz (1991: 274) and Axel (2001: 45) have pointed out that in German, epistemic modal verbs do not occur in optative clauses. As Scholz (1991: 1) indicates, optatives constitute an independent sentence type in German, aside from questions, exclamatives and imperatives. With respect to their syntactic properties, three different types of optatives can be identified, each of them exhibiting a particular verb order: (i) verb initial optatives, (ii) *wenn*-clauses with the finite verb in the final position, and (iii) *dass*-clauses with the finite verb in the final position. According to Scholz (1991: 1), the last type does not seem to be very relevant, since it is hardly attested in the corpora she investigated. Interestingly, both of the two remaining types, which are significantly productive, evolved from antecedents of conditional clauses (verb initial conditionals and *wenn*-conditionals), cf. Scholz (1991: 5). As will be shown in Section 4.17, these are contexts that are not compatible with epistemic modal operators at all.

In her investigation, Scholz (1991: 275) discusses a couple of verb-initial optatives that contain modal verbs, such as examples (751)–(753). Even in environments that make an epistemic interpretation very likely, such as the selection of perfective infinitives, the modal verbs are construed in a circumstantial manner.

- (751) Könnten wir doch das unselig-notwendige Geschäft der
can-SBJV.PST we PAR the unfortunate-necessary business the-GEN
Wahrheitsfindung in unserem Untersuchungsausschuß noch
truth.establishment in our enquiry.board still
vor Weihnachten in Ehren hinter uns gebracht haben!¹⁰⁴
before Christmas in honours behind us bring-PPP have-INF
'(I wish) we could have respectfully terminated that unfortunate yet necessary business of finding out the truth in our enquiry board before Christmas!
- (752) Müsste man doch nicht immer alles bereits einen
must-SBJV.PST one PAR NEG always everything already a
Tag vor der Abgabe fertiggestellt haben!¹⁰⁵
day before the delivery complete-PPP have-INF
'(I wish) you didn't have to finish your work one day before the deadline!'
- (753) Möge ich doch nie wieder in eine derartige Situation kommen!¹⁰⁶
May I PART never again in a such situation come
'May I never ever get into such a situation again!'

104 Die Zeit, 53/87,1; as cited in Scholz (1991: 277).

105 As cited in Scholz (1991: 277).

106 As cited in, Scholz (1991: 278).

- (754) Möge dieses Geschäft nicht nur ein Einkaufszentrum, sondern
 may this shop NEG only a shopping.center but
 neben der Kirche auch ein Ort der Begegnung sein!¹⁰⁷
 besides the church also a place the-GEN encounter be-BE
 'May this shop be not only a shopping centre but a meeting point besides the church!'

Among all modal verbs, only *mögen* is broadly attested in the DeReKo corpus. At first glance, an epistemic interpretation of patterns (753) and (754) does not appear too implausible. Canonically, the speaker is identified as the volitional agent in optatives. It is clear that the speaker in the examples above wishes that some sort of possibility would come true. But it turns out that this possibility is a real possibility in the external world, rather than an assumption that some state of affairs could be true. Likewise, a speaker would never wish that it would become true that he would have some assumption about some state of affairs. Rather, his wishes aim at the practical possibility to realise that state of affairs.

When modal verbs occur in optatives that are realised as *wenn*-clauses with the finite verb in final position, an epistemic interpretation becomes even less likely, as indicated by the examples from the corpus:

- (755) Wenn ich nur wieder gesünder sein könnte.¹⁰⁸
 if I only again in.health be-INF can-SBJV.PST
 'If only I could be healthier again.'
- (756) Herr Doktor, die Operation wäre ja nicht schlimm, wenn
 Sir doctor the surgery is-SBJV.PST PART NEG bad if
 nur die Narkose nicht sein müßte.¹⁰⁹
 only the anaesthesia NEG be-INF must-SBJV.PST
 'Doctor, the surgery would not be that bad if the anaesthesia was not necessary.'

In her analysis, Scholz (1991: 275) formulates a restriction on epistemic operators in optatives. Accordingly, the referent who is identified with the volitional agent can never be identical to the epistemic agent. This indicates that the incompatibility of epistemic modal verbs with optatives is obviously related to an additional reason, i.e., the restriction that they never occur in complement clauses that are embedded by predicates of desire, as will be illustrated in Section 4.15. Arguably, optatives involve some sort of circumstantial modal operator that is specified for volitional modality. Since epistemic modal operators cannot occur in the scope of a circumstantial operator, it becomes clear why modal verbs in optatives fail to be interpreted epistemically.

107 DeReKo: NON08/OKT.05203 Niederösterreichische Nachrichten, 08/10/2008.

108 DeReKo: K99/AUG.60496 Kleine Zeitung, 15/08/1999.

109 DeReKo: H87/JM6.30112 Mannheimer Morgen, 10/07/1987.

As has been demonstrated by Zimmermann (2004: 256), other speaker oriented modifiers, such as the modal particle *wohl*, are equally excluded from optatives:

- (757) * K_äm_e er wohl doch.
 come-SBJV.PST he wohl PAR
 Intended interpretation 'I wish he would possibly come'

Scholz (1991: 268) makes some similar observations with respect to evaluative and epistemic adverbs. Summing up, optatives turned out to be an environment that is not compatible with speaker oriented operators, such as epistemic modal verbs. It shares some essential properties with complement clauses that are embedded by predicates of desire on the one hand, and antecedents of conditional clauses on the other: both of them do not tolerate epistemic modal verbs.

4.15 Excluded from complement clauses

Various authors argue that epistemic modal verbs are subject to restrictions with respect to embedding in complement clauses. Based on data from English, Lyons (1977: 799) assumes that utterances which contain 'subjective' epistemic modal verbs are statements of opinion or hearsay. Accordingly, he suggests that they crucially differ from assertions in their illocutionary force, which in turn are statements of facts and acts of telling. Finally, he concludes that 'subjective' epistemic modal verbs can only be embedded by predicates that express an opinion, such as *think*, but not by predicates of communication, such as *tell*. As Lyons (1977: 799) argues, 'subjective' epistemic *might* can occur directly embedded under *think* but not directly embedded under *tell*:

- (758) He told me that he thought that it might be raining in London.

This roughly corresponds to the position defended by Aijmer (1978: 164) and Papafragou (2006: 1690, 1697), who argue that ('subjective') epistemic modal verbs are restricted to non-factive complement clauses and excluded from factive ones. At first glance, it is not clear to what extent these observations can be extended to German.

Departing from Lyon's initial claim, Öhlschläger (1989: 208) argues that ('subjective') epistemic modal verbs in German are generally banned from complement clauses that are selected by an attitude predicate. Again, his reasoning is essentially based on the assumption that *mögen* is the only epistemic modal verb that unambiguously expresses a 'subjective' epistemic modality. Since, according to his own view, ('subjective') epistemic *mögen* is not grammatical whenever it oc-

curs embedded under an attitude predicate, he concludes that all of the remaining ('subjective') epistemic modal verbs are ungrammatical in these environments.

- (759) * Ich glaube/bezweifle/vermute, daß der Angeklagte der Täter
 I believe/doubt/assume that the accused the culprit
 sein mag.¹¹⁰
 be-INF may
 'I believe /doubt/assume that the accused could have been the culprit.'

However, recall that Öhlschläger's (1989) conclusion is far from compelling. Firstly, if *mögen* is indeed unacceptable in example (759), this is not necessarily due to its ('subjective') epistemicity, but it could also be caused by some idiosyncratic property. Secondly, if *mögen* is really ungrammatical in example (759), this is not necessarily the case for the remaining ('subjective') epistemic modal verbs, as has been demonstrated in Section 4.9 and 4.10.

Upon closer inspection, however, most of these empirical claims turn out to be wrong. Starting with the restrictions suggested by Öhlschläger (1989: 208), it turns out that his judgements do not reflect the use of language documented in corpora. There are even occurrences of epistemic *mögen* which are embedded under an attitude predicate, thus contradicting Öhlschläger's (1989) expectation:

- (760) Ich schätze, dass gerade noch eine fein gefaltete Zeitung
 I guess that just still a finely folded newspaper
 zwischen sein Auto und das am rechten Straßenrand gepasst
 between his car and that at.the right street.border fit-PPP
 haben mag.¹¹¹
 have- may
 'I estimate that there might have been just enough space between his car and the one on the right to fit a folded newspaper inbetween.'
- (761) Andere Autoren vermuten, dass Soma ein alkoholisches Getränk
 other authors assume that Soma a alcoholic drink
 gewesen sein mag.¹¹²
 be-PPP be-INF may
 'Other authors assume that Soma may have been an alcoholic drink'

110 The acceptability judgements reflect those found in Öhlschläger (1989: 208).

111 DeReKo: BRZ09/JUL.18290 Braunschweiger Zeitung, 10/07/2009.

112 DeReKo: WPD/SSS.12965 Wikipedia, 2005.

- (762) Günter Kern (SPD) räumte ein, dass die Erhöhung der
 Günter Kern (SPD) cleared in that the increase the-GEN
 Umlage um 0,8 Prozent im vergangenen Jahr zu gering
 allocation by 0.8 percent in.the passed year too small
 gewesen sein mag.¹¹³
 be-PPP be-INF may

‘Günter Kern (SPD) admitted that the increase of the allocation by 0.8 percent in the last year may have been too low, being only about 0.8 percent.’

Recall that Allard (1975: 88), Öhlschläger (1989: 187 Fn. 121) as well as Diewald (1999: 236, 392) observed that there are two uses of *mögen* that are relevant here, a rather archaic, purely epistemic reading, and a younger one, which has a concessive denotation. Both of them are attested in embedded contexts: The purely epistemic one (cf. 760 and 761) and the concessive one (cf. 762).

Apart from that, there are further unambiguously epistemic verbs that can be found in embedded clauses. Up to now, there is no statement about the existence of an ‘objective’ epistemic interpretation of the future auxiliary *werden*. This is not surprising, since it differs from the canonical ‘objective’ epistemic modal verbs *können* and *müssen* in essential semantic respects, in that it does not express a canonical necessity or possibility.

- (763) Außerdem kenne ich den Richter und weiß, dass er kein
 aside know I the judge and know that he no
 Unmensch ist und schon seine Gründe dafür gehabt
 monster is and PART his reasons therefore have-PPP
 haben wird.¹¹⁴
 have-INF will

‘Aside from that, I am familiar with the judge and know that he is not a monster and that he must have had good reasons.’

- (764) So ähnlich wünscht sich das Mutapcic heute auch, obwohl er
 So similar wishes REFL that Mutapcic today too although he
 ahnt, dass sein Kollege Stefan Koch sich mittlerweile eine
 guesses that his colleague Stefan Koch REFL meanwhile a
 Gegenstrategie ausgedacht haben wird.¹¹⁵
 counter.strategy devise-PPP have-INF will

‘Mutapcic wishes that the fight will go as it did last time although he guesses that his colleague Stefan Koch will meanwhile have devised a counter strategy.’

113 DeReKo: RHZ01/DEZ.02941 Rhein-Zeitung, 04/12/1001.

114 DeReKo: NON09/SEP.18873 Niederösterreichische Nachrichten, 29/09/2009.

115 DeReKo: BRZ06/OKT.04803 Braunschweiger Zeitung, 11/10/2006.

- (765) Doch angesichts der Hirnentnahme wenige Wochen später liegt
 but given the brain.removal few weeks later lies
 die Annahme nahe, dass Wagner den Coup bereits zu diesem
 the assumption close that Wagner the coup already at this
 Zeitpunkt geplant und die Besuche auch genutzt haben
 moment planned and the visits also benefit-PPP have-INF
 wird, um sich Therese und dem engeren Freundeskreis
 will in.order.to REFL Therese an the closer circle.of.friends
 als bevorzugter Gesprächspartner und Vertrauter des
 as preferred dialogue.partner and intimate the-GEN
 Todgeweihten zu empfehlen.¹¹⁶
 moribund-GEN to recommend

'But given the brain removal a few weeks later, it seems likely that Wagner could have already planned the coup at this particular time in order to recommend himself as a close intimate of the moribund.'

Compared to other epistemic verbs, unambiguous instances of epistemic *mögen* and *werden* do not occur so frequently in the DeReKo corpus. This may have several reasons. First of all, epistemic and concessive *mögen* is in general fairly infrequent. Due to its specific semantics, concessive *mögen* requires a particular context. Concessive statements might in principle be less frequent than assumptions. Finally, in the case of *werden*, it is hard to disambiguate between an epistemic reading and the canonical future reference interpretation. It has yet to be checked to what extent epistemic *werden* embedding past referring complements occurs less frequently than its other counterparts, such as *müssen* or *können*. Recall that some authors, such as Vater (1975) and Enç (1996), assume that future auxiliaries, like *werden*, generally have to be considered as epistemic verbs, even when referring to some future event, as discussed in Section 2.2.10.

The examples above are unexpected for an account in the spirit of Öhlschläger (1989: 208). Furthermore, all of them involve modal operators that are evaluated with respect to an explicitly determined deictic centre that is syntactically realised in the matrix clause. This becomes particularly clear in those cases where the deictic centre is not co-referential with the speaker. Accordingly, the deictic centre is identified with the subject referent of the predicate *vermuten* 'assume' realised by the NP *andere Autoren* 'other authors' in example (761), with the subject referent of *einräumen* 'admit' realised by the NP *Günter Kern* in (762), with the subject referent of the predicate *ahnen* 'guess' realised by the NP *Mutapcic* in (764), and with the referent encoded by the covert experiencer argument of *Annahme* 'assumption' in (765). Stephenson (2007: 489) has made a similar observation. In

¹¹⁶ DeReKo: BRZ08/JUL.08346 Braunschweiger Zeitung, 16/07/2008.

accordance with Lasersohn (2005: 277), she shows that an embedded epistemic modal verb is always evaluated with respect to an argument of the super-ordinate predicate.

Crucially, the relevant individual to whom the epistemic judgement is attributed is the one realised as an argument of the relevant matrix predicate. Of course, this does not exclude that there might be other referents that reach conclusions similar to the one expressed by the embedded proposition. But this does not necessarily imply that the judgements of these other referents affect the interpretation of the modal operator, as it would be expected for an ‘objective’ epistemic modal verb. Rather, the embedded modal verbs in the examples above are exclusively evaluated with respect to the respective argument provided by the superordinate predicate. All of these sentences are true even if there is no other referent who reaches the same conclusion as the one expressed by the modified proposition. As a consequence, there is no reason to regard these modals as ‘objective’ epistemic modals. But what else could they be? As already shown in Section 4.11, certain operators may induce a context shift for epistemic modal operators, which causes a shift of the deictic centre from the speaker to some other salient individual, notably some animate argument in the superordinate clause. It is plausible to assume that the epistemic modal verbs in the examples above all involve a context shift in which the deictic centre is realised by an argument in the matrix clause. It turns out, then, that epistemic modals can be embedded, even if they are not ‘objective’. Lyons (1977: 799) and Papafragou (2006: 1691) have already provided some examples of ‘subjective’ epistemic modal verbs embedded in non-factive complement clauses for English.

In a similar fashion, Diewald (1999: 84) explicitly states that the embedding of ‘subjective’ epistemic modals is generally ruled out. Based on the observations made by Lyons (1977: 798), who noticed that the ‘subjective’ epistemic interpretation of *may* is “more or less equivalent” to the adverbial *perhaps*, she concludes that epistemic adverbials are restricted to a subjective interpretation. An analogous claim has been made by Öhlschläger (1989: 211), who reports that epistemic adverbs behave exactly like ‘subjective’ epistemic verbs, in that they are not compatible with a sentence accent or with a matrix negation, and in that they are generally prohibited in embedded clauses. In a similar vein, Diewald (1999: 84) argues that epistemic adverbs are excluded from embedded clauses, as is illustrated in example (766). Likewise, Kiefer (1984: 69) concludes, based on data from Hungarian, that epistemic adverbs are always ‘subjective’ epistemic. Furthermore, Watts (1984: 138) claims that epistemic adverbs in English can only be construed with a ‘subjective’ epistemic interpretation.

In contrast to the assumptions made by Diewald (1999: 84) and Öhlschläger (1989: 211), however, there is vast evidence of epistemic adverbs being embedded

by various types of predicates, as is demonstrated in examples (767)–(774). Some of the adverbs even occur very frequently in embedded contexts, such as *vielleicht* ‘maybe’ or *womöglich* ‘possibly’. If epistemic adverbs indeed always exhibit a ‘subjective’ epistemic interpretation, Öhlschläger’s and Diewald’s assumptions concerning the acceptability of epistemic operators in embedded clauses cannot be correct.

- (766) * Ich wußte, daß ich mich vielleicht getäuscht habe.¹¹⁷
 I knew that I REFL maybe err-PPP have
 ‘I knew that I could have been wrong.’
- (767) Ich wusste, dass es vielleicht ein Frühstart war, probierte aber,
 I knew that it maybe a false.start was tried but
 gut zu schwimmen¹¹⁸
 good to swim
 ‘I knew that it might have been a false start but I tried to swim on as well as I could.’
- (768) Dass er für dauerhafte Beziehungen womöglich nicht geschaffen
 that he for long.lasting relationships possibly NEG made
 sei, hat Clooney bereits öfter in Interviews
 is-SBJV.PRS has Clooney already frequently in interviews
 eingestanden.¹¹⁹
 admitted
 ‘Clooney has already acknowledged several times in interviews that he is possibly not made for longterm relationships.’
- (769) Aber vor allem ist er dafür verantwortlich, dass der Klub
 but above all is he therefore responsible that the club
 sich womöglich in diesem Jahr seinen Traum erfüllen kann¹²⁰
 REFL possibly in this year its dream fulfill-INF can
 ‘But, above all, he is responsible for the fact that the club may be able to fulfil its dream in the present year.’
- (770) Vom Fahrzeug des Unbekannten weiß die Polizei
 about.the vehicle the-GEN unknown knows the police
 bisher nur, dass es womöglich ein italienisches Kennzeichen
 so.far only that it possibly a Italian number.plate
 gehabt hat.¹²¹
 have-PPP had

117 The acceptability judgements reflect those found in Diewald (1999: 84), example (90).

118 DeReKo: SOZ07/MAR.06486 Die Südostschweiz, 30/03/2007.

119 DeReKo: HAZ08/MAI.05569 Hannoversche Allgemeine, 30/05/2008.

120 DeReKo: BRZ10/MAR.13972 Braunschweiger Zeitung, 29/03/2010.

‘Regarding the vehicle of the unknown person, the police only know that it maybe had an Italian number plate.’

- (771) Hier sollte man wissen, dass Elizabeth I. wahrscheinlich am
Here should one know that Elizabeth I probably from
Rokitansky-Syndrom, einer Scheidenverengung mit from
Rokitansky-Syndrome a vaginal.stenosis with
unausgebildeter Gebärmutter litt.¹²²
undeveloped uterus suffered

‘At this point, you should consider that Elizabeth I probably suffered from the Rokitansky-Syndrom, which is a congenital disorder.’

- (772) Ich habe gewusst, dass es bestimmt eine verbreitete Meinung
I have known that it certainly a widespread belief
gibt, auch unter der Kategorie Walser.¹²³
gives even among the category Walser

‘I knew that there was probably a widespread belief, even among the category of Walser.’

- (773) Konsumsüchtige und Pfennigfuchser werden
consumption.addicted and penny.pinchers PASS.AUX
gleichermaßen daran erinnert, dass sie bestimmt noch
equally at.it remind-PPP that they certainly yet
etwas brauchen.¹²⁴
something need

‘Shopping addicts and penny pinchers are reminded that there is certainly a need for something more.’

- (774) Das große Loch in der Hose am Knie zeigt, dass er es
the big hole in the trousers at.the knee shows that he EXPL
bestimmt nicht zu (irdischen) Reichtümern gebracht hat.¹²⁵
certainly NEG to (earthly) wealth brought has

‘The big hole at the knee of the trousers demonstrates that he certainly has not managed to acquire earthly wealth.’

In a similar vein, Zimmermann (2004: 265) demonstrated that the discourse particle *wohl* can be embedded in complement clauses. According to him, *wohl* qualifies the modified proposition as a mere hypothesis. Zimmermann (2004: 268)

121 DeReKo: RHZ06/AUG.03522 Rhein-Zeitung, 04/08/2006.

122 DeReKo: NUZ04/FEB.01917 Nürnberger Zeitung, 18/02/2004.

123 DeReKo: R99/AUG.65558 Frankfurter Rundschau, 18/08/1999.

124 DeReKo: RHZ99/OKT.06336 Rhein-Zeitung, 08/10/1999.

125 DeReKo: WPD/HHH.06023 MichaelDiederich; Wikipedia, 2005.

assumes that, in contrast to epistemic modal verbs, *wohl* is a modifier which even scopes over the sentence type. Therefore, he assumes that it takes a high position in the clausal architecture, in his perspective in ForceP. In embedded clauses, *wohl* will obligatorily undergo a context shift. Following Zimmermann's view, the deictic centre which qualifies the proposition as a hypothesis in (775) can only be the matrix subject *Schröder*, but not the speaker.

- (775) Schröder hat gesagt, dass die SPD wohl Unterstützung verdient.
 Schröder has said that the SPD wohl support merits
 'Schröder has said that the SPD probably deserves support.'

In opposition to the approaches defended by Öhlschläger (1989: 208) and Diewald (1999: 84), other authors, such as Axel (2001: 45) and Krämer (2005: 23), assume that epistemic modal verbs are only excluded from a subclass of complement clauses. According to them, these verbs are banned from complements of non-factive predicates, such as *fürchten* 'be afraid of'. Instead, ('subjective') epistemic modal verbs can be found embedded under a multitude of predicate types. In what follows, a small overview will be given.

As has been pointed out above, epistemic modals occur under non-factive epistemic predicates such as *meinen* 'believe', which bring about a context shift that identifies the deictic centre with an argument of the matrix predicate, as illustrated in example (776) with the rather rare epistemic use of *müsste*:

- (776) Die Kripo meint weiter, dass bei dem Einbruch
 the criminal.police believes further that by the burglary
 erheblicher Lärm entstanden und eventuell von Zeugen
 considerable noise arise-PPP and eventually by witnesses
 bemerkt worden sein müsste.¹²⁶
 notice pass.aux-PPP be-INF must-SBJV.PST
 'In addition, the criminal investigation department believes that the burglary must have made much noise and must have been noticed by some witnesses.'

Other non-factive epistemic predicates that frequently embed epistemic modal verbs are *vermuten*, *annehmen* and *glauben*. In a lot of cases, their complement clauses contain the epistemic modal verb *könnte*.

Moreover, there are non-factive emotive predicates that select clauses containing epistemic modal verbs, such as *Hoffnung* 'hope-NOUN' (cf. 777) and *befürchten* 'be afraid of' (cf. 778). Again, the deictic centre is shifted to an argument depending on the respective predicate expression:

126 DeReKo: RHZ07/JUN.08087 Rhein-Zeitung, 09/06/2007.

- (777) Gieraths gab der Hoffnung Ausdruck, dass bereits Ende 2007 der Gieraths gave the hope expression that already end 2007 the erste Bauabschnitt abgeschlossen sein dürfte.¹²⁷
first construction.section accomplish-PPP be-INF might
'Gierath expressed his hope that the first construction section might have already been accomplished by the end of 2007.'
- (778) Er befürchtete zudem, dass der Bestand der Haupt- und he feared moreover that the existence the-GEN main and Realschulen in Remlingen und Schöppenstedt durch eine IGS real.schools in Remlingen and Schöppenstedt by a IGS gefährdet sein könnte.¹²⁸
threaten-PPP be-INF could
'Moreover, he was afraid that the existence of the secondary schools in Remlingen and Schöppenstedt could be threatened by an IGS.'

Finally, ('subjective') epistemic modal verbs in German turn out to pattern with their English counterparts with respect to their behaviour in non-factive complement clauses. In both languages, they are attested in non-factive complement clauses. As a consequence, generalisations in the spirit of Diewald (1999: 84) are far too restrictive and have to be refuted.

A couple of authors suggest another restriction for epistemic modal operators in complement clauses. Lyons (1977: 799), Aijmer (1978: 164), Papafragou (2006: 1690, 1697) and Huitink (2008: 6) argue that complements of factive predicates in English can only contain ('objective') epistemic modal verbs, whereas their ('subjective') epistemic counterparts are restricted to complements of non-factive predicates, such as attitude predicates. Consider first Lyon's (1977) reasoning, which seems to be based on the assumption that predicates of communication only embed communicative acts that correspond to the act expressed by the predicate under discussion. Remember that Lyons (1977: 799) assumes that 'subjective' epistemic modal verbs are not acts of telling but statements about opinion or hearsay. Therefore, he predicts that they cannot be embedded by predicates of telling. Do these claims extend to German?

Some authors, such as Krämer (2005: 23), assume that the epistemic modal verb *werden* cannot be embedded by the predicates *wissen* 'know' and *hoffen* 'hope'. But as has already been demonstrated above, epistemic *werden* is attested in *dass*-clauses that are selected by *wissen* (cf. 763–765). As for the other verbs, a solid sample of data collected from the German DeReKo corpus demonstrates

127 DeReKo: RHZ06/AUG.06329 Rhein-Zeitung, 08/08/2006.

128 DeReKo: BRZ09/JUN.11090 Braunschweiger Zeitung, 24/06/2009.

that there are epistemic modal verbs in factive complement clauses embedded by predicates of communication, such as predicates of telling (cf. 779 and 780), predicates of declaring (cf. 781), other predicates of communication, such as negated *schreiben* ‘write’v(cf. 782), as well as predicates of perception (cf. 783). As will be shown later, it is more plausible to assume that they are interpreted in a ‘subjective’ way rather than in an ‘objective’ one.

- (779) Ein Kollege hat mir erzählt, dass es da schlimm ausgesehen
 a colleague has me told that it there bad out.look-PPP
 haben muss.¹²⁹
 have-INF must
 ‘A colleague told me that there must have been quite a mess.’
- (780) Und er erzählt, dass dieses Rätsel bald gelöst sein könnte.¹³⁰
 And he tells that this riddle soon solv-PPP be-INF could
 ‘And he said that this riddle could be solved soon.’
- (781) Polizeisprecher Thomas Figge erklärte gestern auf Anfrage,
 police.spokesman Thomas Figge declared yesterday on demand
 dass der 33-Jährige mindestens Tempo 100 gefahren sein
 that the 33.year.old at.least tempo 100 drive-PPP be-INF
 muss.¹³¹
 must
 ‘The police spokesman Thomas Figge declared yesterday, on demand, that the 33 year old must have driven at least 100 km/h.’
- (782) Sie schreiben aber nicht, dass die „Verschlankung“ hauptsächlich
 You write but not that the streamlining mainly
 zu Lasten des Bürgers gegangen sein dürfte.¹³²
 to burden the-GEN citizen go-PPP be-INF might
 ‘But you don’t write that the streamlining could have affected in particular the common citizens.’
- (783) Außerdem habe ich vernommen, dass möglicherweise ein
 in.addition have I heard that possibly a
 Lungeninfarkt die Ursache gewesen sein könnte.¹³³
 pulmonary.infarction the cause be-PPP be-INF could
 ‘In addition, I have heard that the cause could have possibly been a pulmonary infarction.’

129 DeReKo: RHZ01/NOV.07278 Rhein-Zeitung, 10/11/2001.

130 DeReKo: NUN03/AUG.02519 Nürnberger Nachrichten, 28/08/2003.

131 DeReKo: BRZ09/MAI.05146 Braunschweiger Zeitung, 12/05/2009.

132 DeReKo: RHZ06/JUL.23923 Rhein-Zeitung, 26/07/2006.

133 DeReKo: NON09/JAN.07234 Niederösterreichische Nachrichten, 19/01/2009.

It merits closer attention that the epistemic modal verbs embedded in the examples above behave in a peculiar way with respect to the identity of the deictic centre. In contrast to epistemic modal operators in non-factive complement clauses, the deictic centre can be principally linked to the speaker in factive complement clauses that are embedded by predicates of communication, as in example (782). The identity of the deictic centre seems to be less clear in examples (779)–(781). Most plausibly, the epistemic modal verbs in these examples reflect an assumption of the matrix subject referent: *Ein Kollege* ‘a colleague’ in example (779), *er* ‘he’ in (780) and *Polizeisprecher Thomas Figge* in (781). But this type of example does not entirely exclude that the truth evaluation expressed by the epistemic modal verb is done by the speaker. This concerns, in particular, situations in which the speaker wants to express that he is not so sure whether the proposition uttered by the matrix subject referent indeed holds. In such configurations, this referent is not interpreted as a suitable epistemic agent and therefore, the deictic centre is identified with the speaker. Admittedly, this type of interpretation is rather rare.

Finally, with predicates of communication that concern the perceptive (rather than productive) aspect, such as *vernehmen* ‘hear’ in example (783), there are two possibilities to identify the deictic centre. The most plausible interpretation is probably the one in which the deictic centre is instantiated by the matrix subject referent *ich* ‘I’. In addition, it is possible to link the deictic centre to the referent who has uttered the embedded proposition. This is the case in a context in which the speaker refers to an assumption that has been made by somebody else. As for the example given above, this would be a referent who uttered: ‘The cause could possibly have been a pulmonary infarction’. Accordingly, the epistemic evaluation is done by that other referent rather than the speaker. This results in an interpretation in which the speaker indicates that the embedded proposition is a reported assumption. In such an interpretation, it is not necessary that the speaker shares the judgement of that other referent as it is expressed in the reported assumption. For instance, he may know that the cause was indeed something other than a pulmonary infarction.

Apart from that Fintel and Gillies (2008: 93) discuss the constructed example (784), in which an epistemic modal is embedded under the factive predicate *realize*:

- (784) If Blofeld realizes you might be in Zürich, you can breathe easy – he’ll send his henchman to Zürich to find you.

Once again, the epistemic judgement is attributed to an argument referent of the superordinate predicate.

As has been illustrated, epistemic modal verbs behave differently in factive and non-factive complement clauses. This is obviously due to the crucial contrast between non-factive and factive predicates. Whereas non-factive predicates introduce an experiencer argument which encodes an epistemic agent, factive predicates do not contribute such an argument. In some cases, they might involve some sort of related argument that does not manifestly refer to an epistemic agent *per se*, such as a referent who tells something in example (780). However, by means of pragmatic mechanisms such as coercion it is possible to reinterpret the ‘teller’ argument as an epistemic agent.

When an epistemic modal verb is embedded in a complement clause and the matrix verb introduces an argument that is explicitly labelled as an epistemic agent, the deictic centre will have to be linked to this matrix argument. This reflects the behaviour of epistemic modal verbs in non-factive complement clauses. In a similar fashion, Zimmermann (2004: 265) argues that related epistemic modifiers, such as the discourse particle *wohl*, may never take scope out of a complement clause. In other words, as long as such a modifier occurs in a complement clause the deictic centre will be identified with an argument of the superordinate predicate rather than the speaker. Since factive predicates do not provide an argument that refers to a manifest epistemic agent, the identification of the deictic centre is more flexible and underlies different principles.

If the examples discussed above indeed contain ‘objective’ epistemic modal verbs, it is expected that the proposition expressed by the embedded clause should be an assumption that could generally be derived from public evidence, as is argued by Papafragou (2006: 1697). But this is clearly not the case in examples (779)–(783). In each case, the referent who is in a position to make the judgement expressed by the embedded clause is clearly determined by an argument of the matrix predicate. As it turns out, the interpretation of epistemic modal operators in non-factive complement clauses and factive ones is very similar. This is reflected by the acceptability judgements provided by Papafragou (2006: 1690): Whereas she considers ‘subjective’ epistemic modal verbs that are embedded in non-factive complement clauses fully acceptable, she judges them to be marginally acceptable (‘?’) in factive complement clauses rather than completely ungrammatical (‘*’). The reason why her examples sound less acceptable might be due to the fact that they do not involve a plausible context that provides a salient candidate to be identified as the deictic centre. Once again, all of these observations indicate that even ‘subjective’ epistemic modal verbs can be embedded by predicates of telling. Finally, all of their main clause counterparts are most plausibly interpreted in the ‘subjective’ epistemic interpretation.

After having discussed factive predicates of communication, the remainder of this section will now shift the focus to other types of factive predicates. Lyons

(1977: 799) assumes that ‘objective’ epistemic modal verbs are possible in complement clauses that are embedded by factive predicates. According to him, this class encompasses communicative verbs like *tell* as well as verbs like *know*. Some authors, such as Aijmer (1978: 164), Papafragou (2006: 1690, 1697) and Huitink (2008: 6), conclude that their ‘subjective’ epistemic counterparts are generally excluded within from these environments in English.

But as it turns out for German, ‘subjective’ epistemic modal verbs are attested under (semi)-factive predicates and expressions, such as *Tatsache* ‘fact’ (cf. 785) and *zeigen* ‘show’ (cf. 786) as well as under emotive (semi)-factive predicates such as *erstaunlich* ‘astounding’ (cf. 787).

- (785) Allein die Tatsache, dass er in seiner Ausbildung beim BKA
just the fact that he in his education at.the BKA
gelernt haben dürfte, welche geringe Trinkmenge bereits
learn-PPP have-INF might what small drink.quantity already
ausreicht, um den Autoschlüssel erst gar nicht mehr in
in.order.to the car.key PART INTN NEG more in the
die Hand zu nehmen, ließ den Richter zweifeln.¹³⁴
hand to take let the judge doubt
‘Even the fact that he might have learnt at the BKA what small quantities of alcohol
are permitted for car drivers made the judge doubtful.’
- (786) Aber der aktuelle Fall zeigt, dass die Bank ihre Linie geändert
But the actual case shows that the bank its line change-PPP
haben dürfte.¹³⁵
have-INF might
‘But the current case shows that the bank might have changed its strategy.’
- (787) Erstaunlich, dass noch kein Anhänger etwa des Dalai
surprising that yet no fan for.example the-GEN Dalai
Lama sich klargemacht haben dürfte, dass das Gold in
Lama REFL clear.make-PPP have-INF might that the gold in
tibetischen Tempeln daher stammte, dass die Mönche, die
Tibetean temples there.from stemmed that the monks the
auch die Beamenschaft stellten, das einfache Volk
also the civil.service represented the simple people
ausgebeutet hatten.¹³⁶
exploited had

¹³⁴ DeReKo: RHZ07/JUL.17219 Rhein-Zeitung, 18/07/2007.

¹³⁵ DeReKo: BVZ09/OKT.00654 Burgenländische Volkszeitung, 07/10/2009.

‘It is surprising that no admirer of the Dalai Lama may have realised that the gold in Tibetan temples was exploited from the ordinary people.’

Apart from the examples given here, further similar factive predicates were recorded, such as *sich herausstellen* ‘turn out’ and *ergeben* ‘result’. This is in accordance with Hacquard and Wellwood (2012: 11), who have illustrated that the English epistemic modal verbs are attested in a broad range of complement clauses.

As already observed above, factive predicates do not involve an argument with prototypical properties of an epistemic agent. Accordingly, the deictic centre of the epistemic operator does not always have to be identified with an argument of the superordinate predicate, as illustrated in example (786), in which it is identified with an argument of a predicate that is located even higher in the clausal hierarchy.

Assuming that (‘subjective’) epistemic modal verbs involve a deictic centre that has to be linked to some salient referent, it is possible to account for all of those instances that are embedded in factive complement clauses. But what ensures that these cases do involve ‘subjective’ epistemic modality rather than ‘objective’ epistemic modality? First of all, each of these examples contains a modal operator that does not relate to objective facts that everybody could derive from ‘public evidence’, as it would be expected by Öhlschläger (1989: 192), Nuyts (2001b: 393), Papafragou (2006: 1697) and Huitink (2008: 5). According to Nuyts, the use of a subjective epistemic modifier indicates that the speaker “alone knows (or has access to) the evidence and draws conclusions from it”, while objective epistemic modality indicates that “the evidence is known to a larger group of people who share the same conclusion based on it”.¹³⁷ In opposition to that, the modal operators in (785)–(787) reflect claims that are made by clearly contextually determined epistemic agents. This epistemic agent is realised as a matrix argument or the speaker referent in each case. Crucially, in none of these cases does the acceptability of the embedded modal operators hinge on the existence of additional epistemic agents which are not already represented by that matrix argument or the speaker referent. As a consequence, the deictic centre is always strictly linked to a matrix argument or the speaker, and never involves additional less specifically identified referents. Of course, this does not exclude that there are other individuals that draw exactly the same conclusion as expressed by the embedded proposition, but this is not part of the meaning of the epistemic operator. This behaviour is reminiscent of epistemic predicates, such as *believe* and *think*. Most notably, these predicates attribute a private belief to the subject referent.

136 DeReKo: NUZ07/MAR.02890 Nürnberger Zeitung, 27/03/2007.

Again, nothing excludes the possibility that there are other individuals that independently have the same belief – but this is irrelevant for the interpretation of these predicates. Likewise, it seems, then, that every epistemic modal operator encodes a private belief. If these epistemic modal verbs embedded in factive complement clauses only refer to an assumption that is made by the deictic centre but never to assumption of a vaguely determined larger group of people that witnesses the ‘public evidence’, the question arises to what extent the distinction between ‘subjective’ and ‘objective’ epistemic modality is really necessary.

Secondly, the term ‘public evidence’ as used by Papafragou (2006: 1697) requires a more thorough elaboration. From an intuitive perspective, it seems to be clear what it should mean. Yet, it is not clear whether it really supports the assumption of ‘objective’ epistemic modality. Consider the following paraphrase for an ‘objective’ epistemic necessity operator: There is a set of individuals that all have the same knowledge and based on this knowledge it logically follows that the modified proposition is true. This paraphrase involves three crucial aspects: first the shared knowledge, the nature of the conclusion, and the set of individuals. Accordingly, ‘public evidence’ means that all of the relevant individuals have the same knowledge. How can this observation be captured in precise terms? Firstly, it will be hardly ever possible for two individuals to have exactly the same knowledge. As a consequence, ‘public evidence’ can only concern some sub-part of the individuals’ knowledge. Then, the question arises how this sub-part is precisely determined. The most appropriate solution appears to be to define ‘public evidence’ as a set of propositions that is part of every relevant individual’s knowledge. Accordingly, any proposition will be considered as an ‘objective’ epistemic necessity if it logically follows from the set of proposition that make up the ‘public evidence’. Analogously, ‘objective’ epistemic possibility corresponds to any proposition that is logically consistent with this set of propositions. Since ‘objective’ epistemic modifiers are canonically seen as logical operators, individuals exposed to the ‘public evidence’ will always evaluate a given proposition in the very same manner. ‘Objective’ epistemic reasoning excludes any individual influence and will lead to the same conclusion for each epistemic agent. Unfortunately, this approach faces another substantial shortcoming concerning the nature of the conclusion. It would predict that the individuals’ remaining knowledge apart from the set of proposition labelled as ‘public evidence’ does not have any influence on the evaluation of the modally modified proposition. But this is not plausible: any in-

137 Actually, Nuyts (2001b: 393) employs the term ‘inter-subjective’ epistemic modality rather than ‘objective’ epistemic modality. Nevertheless, his new term essentially corresponds to what Lyons (1977) called ‘objective’ epistemic modality.

dividual might have experiences that are relevant for the epistemic evaluation of the respective proposition while not being part of the ‘public evidence’.

Assume that the ‘public evidence’ in example (786) is defined by the set of propositions $E = \{ \text{‘The bank is accused of fraud.’, ‘A lot of costumers lost their assets.’, ‘The costumers claimed compensation.’, ‘The bank ignored their claims arguing every costumer was aware of the risk.’, ‘Suddenly, the bank signals cooperativeness to talk with the costumer.’} \}$. Based on this set, the journalist draws the conclusion expressed in (786): ‘But the actual case shows that the bank might have changed its strategy.’ In case this reasoning involves ‘objective’ epistemic modality, it is expected that every individual that knows this set of proposition E will always reach the same conclusion. However, there could be an insider whose knowledge comprises the public evidence E and additionally some more specific evidence $E' = \{ \text{‘In three similar cases in the past, the bank already showed cooperative.’, ‘In none of them were the claims of the costumers admitted.’, ‘The bank’s favoured diversionary tactic is to signal cooperativeness with the costumers’} \}$. Certainly, this insider will not share the conclusion drawn by the journalist expressed in example (786). In the most extreme case, he could come to the opposite conclusion that the embedded proposition is not the case: ‘But the actual case shows that the bank might not have changed its strategy’. Similar situations frequently occur in scientific discussion: different researchers arrive at different conclusions based on the same observations. And it is in particular their reasoning that is considered as the canonical case of ‘objective’ epistemic modality, as it argued by Papafragou (2006: 1695).

This indicates that ‘objective’ knowledge is a fairly intricate thing to model. It is not clear whether a precise description of ‘objective’ epistemic modality is possible that is not based on ‘subjective’ epistemic reasoning. As the observations above indicate, it is not possible to strip off the subjective aspect of epistemic reasoning. Every epistemic assessment is primarily based on individual private knowledge. This even concerns so-called ‘objective’ epistemic reasoning, which turns out to be as ‘subjective’ as ‘subjective’ epistemic reasoning. Likewise, it remains to be proven that there are indeed conclusions based on ‘public evidence’ that do not involve private knowledge and ‘subjective’ epistemic reasoning. Unless there is a clear definition of what exactly ‘public evidence’ is, any attempt to pursue an account that is based on that concept is premature. Since ‘objective’ epistemic modality does not seem to be compatible with its fundamental concept of ‘public evidence’, it is doubtful to what extent it exists at all.

Finally, Papafragou (2006: 1690) concedes that ‘subjective’ epistemic modal verbs in factive complement clauses are not entirely ungrammatical, but rather less acceptable. As a consequence, the degree of acceptability that she attributes to ‘subjective’ epistemic operators in factive complement clauses is only slightly

lower than the one she attributes to their ‘objective’ epistemic counterparts in analogous environments. However, there is an alternative explanation for these undeniable contrasts of acceptability. Based on the assumption that epistemic modal operators are always interpreted in a ‘subjective’ manner, this lower degree of acceptability could be due to the fact that some of the contexts in Papafragou’s (2006) examples do not clearly provide determined epistemic agents as possible candidates for the deictic centre. At this point the following question arises: What requires the assumption of an ‘objective’ epistemic modality at all? This issue will be more thoroughly addressed in Section 4.22.

A similar observation regarding factive complement clauses has been made by Haegeman (2006: 1664), who points out that factive predicates such as *regret* are “not easily compatible” with speaker oriented adverbs. Haegeman (2004: 171) generally assumes that factive complement clauses involve less syntactic complexity; in particular, they lack a ForceP. Coniglio (2008: 91) reaches a similar conclusion.

Finally, there are verbs that lack arguments which are suitable as a deictic centre altogether, even on the conceptual layer, such as *führen zu* ‘lead to’, *sorgen für* ‘ensure’ and *beitragen zu* ‘contribute’.

- (788) Dank diesem Auswärtsremis rückten sich die Romands für das
 thanks this away.draw moved REFL the Romands for the
 Rückspiel in zwei Wochen in eine ausgezeichnete
 return.match in two weeks in a excellent
 Ausgangslage und sorgten dafür, dass die Pontaise wieder
 starting.position and caused therefore that the Pontaise again
 einmal bis auf den letzten Platz gefüllt sein dürfte.¹³⁸
 once until of the last place fill-PPP be-INF might

‘Due to that draw away the Romands got into an excellent starting position for the return match in two weeks and they will ensure that the Pontaise might be crowded one more time.’

Since the matrix predicate lacks an appropriate argument, the deictic centre is identified with the most salient referent supplied by the context – in the cases above, with the speaker.

Nevertheless, there are some types of complement clauses which seem to exclude epistemic modal verbs systematically, such as complements of desiderative predicates. This clearly has pragmatic reasons, since no speaker would wish to assume that a particular state affairs is the case; rather they would wish this state of

138 A98/SEP.58581 St. Galler Tagblatt, 18/09/1998.

affairs to become true. In a similar fashion, Schenner (2009: 186) points out that desiderative predicates do not allow reportative uses of *sollen*.

- (789) # Der Archäologe wünscht sich, dass die Mumie schon mehr
 the archaeologist wishes REFL that the mummy already more
 als 5000 Jahre alt sein dürfte/könnte.
 than 5000 years old be-INF might/could.

Intended reading: 'The archeologist wishes that the he/someone would consider it possible that the mummy is more than 5000 years old.'

Likewise, Krämer (2005: 23) points out that epistemic verbs such as *werden* are banned from complement clauses of semantically related predicates such as *hoffen* 'hope'. Similarly, Hacquard and Wellwood (2012: 18) and Anand and Hacquard (2013) have demonstrated that epistemic modal verbs are not attested in complement clauses of desiderative predicates in English.

Summing up, in this section it has been demonstrated that epistemic modal verbs are empirically attested in numerous types of complement clauses. Non-factive predicates typically introduce an animate agent or experiencer argument, which is typically in the state of reasoning about some state of affairs. In this, it much resembles the deictic centre which is provided by an epistemic modal operator. Therefore, this argument becomes a plausible candidate to be identified with the deictic centre, and this is how canonical context shift is induced. By contrast, factive predicates often lack such an argument that is suitable for an identification with the deictic centre. Contrary to the assumptions made by Lyons (1977: 799), Aijmer (1978: 164), Papafragou (2006: 1690, 1697) and Huitink (2008: 6), 'subjective' epistemic modal operators are even attested in factive complement clauses. In the absence of an appropriate argument, the deictic centre will be identified with the most salient referent provided by the context; in most cases this will be the speaker. Moreover, it has been shown that the assumption of 'objective' epistemic modality is not necessary to account for the occurrence of epistemic modal verbs that are embedded in factive complement clauses. Furthermore, 'objective' epistemic modality is based on 'public evidence', which has turned out to be a rather problematic notion. Alternatively, epistemic modals in factive complement clauses can be explained in terms of a deictic centre that does not always have to be linked to the speaker referent. Rather, it will be identified with the most salient referent in its immediate environment.

4.16 Excluded from event-related causal clauses

As Nuyts (2001a: 212) observes, epistemic modal verbs “sound very awkward if not downright impossible” in causal clauses in German and Dutch. According to Aijmer (1978: 164), Öhlschläger (1989: 209) argues that in German, causal *weil*-clauses cannot embed ‘subjective’ epistemic modal verbs. Assuming that most modal verbs are ambiguous between a ‘subjective’ and ‘objective’ epistemic interpretation, he concludes that the items in (790) have to be interpreted in an objective way. According to him, *mögen* is the only unambiguously ‘subjective’ epistemic modal verb. Therefore, he expects it to be ungrammatical in causal clauses, as is illustrated in example (791).

(790) Der Angeklagte wird inhaftiert, weil er der Täter sein
 the accused PASS.AUX arrested because he the culprit be-INF
 muß/dürfte/kann.¹³⁹
 must/might/can

‘The accused will be arrested because he must/might/could be the culprit.’

(791) * Der Angeklagte wird inhaftiert, weil er der Täter sein
 the accused PASS.AUX arrested because he the culprit be-INF
 mag.¹⁴⁰
 may

‘The accused will be arrested because he might be the culprit.’

As already shown in various other sections, Öhlschläger’s reasoning is empirically not justified. First of all, there are different reasons why example (791) appears to be more marked than example (790). Recall that the epistemic use of *mögen* conveys a rather specific concessive meaning, as opposed to the remaining epistemic modal verbs. Secondly, even epistemic *mögen* is attested in causal clauses, as will be shown below.

There are different types of causal clauses: event-related causal clauses, epistemic causal clauses and speech act causal clauses, as pointed out by Sweetser (1990: 77). As demonstrated by Wegener (1993: 293), Uhmann (1998: 120), Günthner (2008: 112) and Antomo and Steinbach (2010: 30), epistemic (and speech act) causal clauses in German exhibit independent illocutionary force. They can contain discourse particles, speaker oriented adverbs and epistemic modal verbs, as was illustrated in Section 3.4.2. The restriction on epistemic modal verbs claimed by Aijmer (1978: 164) and Öhlschläger (1989: 209) would only make

¹³⁹ The acceptability judgements reflect those found in Öhlschläger (1989: 209).

¹⁴⁰ The acceptability judgements reflect those found in Öhlschläger (1989: 209).

sense for event-related causal clauses. As observed by Wegener (1993: 295), it is a crucial property for event-related *weil*-clauses, namely that the proposition expressed by the matrix clause is presupposed – whereas it is an assumption in the case of epistemic *weil*-clauses.

Again, it turns out that epistemic modal verbs are attested in event-related *weil*-clauses. If they are indeed ‘subjective’ epistemic modal, it should be possible to clearly identify the deictic centre. Various types of data have to be distinguished with respect to the way the deictic centre is identified. In the first type, the deictic centre is instantiated by some argument introduced by the matrix predicate.

- (792) Er habe auch Schuldgefühle gehabt, weil seine
 he have-SBJV.PRS also guilt.feelings had because his
 auffällige Frisur Auslöser für den Überfall gewesen sein
 peculiar hair.cut cause for the robbery be-PPP be-INF
 könnte.¹⁴¹
 could
 ‘He had also feelings of guilt because his peculiar hair cut could have been the cause of the robbery.’
- (793) Gegenüber der Polizei gab die Täterin schließlich an, dass
 face.to.face the police gave the delinquent finally on that
 sie zugestochen hatte, weil sie die ihr bekannte Postbeamtin
 she stabbed had because she the her known post.clerk
 erkannt haben könnte.¹⁴²
 recognise-PPP have-INF could
 ‘When being questioned, the delinquent finally stated that she stabbed the post clerk because (she was afraid that) she could have been recognised by her.’
- (794) Weil der Schlossverkauf nun doch abgeblasen sein dürfte,
 because the castle.sale now PART blow.off-PPP be-INF might
 überlegt die Gutsverwaltung die Errichtung eines
 considers the property.administration the construction a-GEN
 Heizwerkes.¹⁴³
 heating.station-GEN
 ‘Because the sale of the castle might have been canceled, the administration of the property considers an construction of a heating station.’

141 DeReKo: BRZ07/OKT.02983 Braunschweiger Zeitung, 12/10/2007.

142 DeReKo: NON09/MAR.00732 Niederösterreichische Nachrichten, 02/03/2009.

143 DeReKo: NON09/MAR.19357 Niederösterreichische Nachrichten, 31/03/2009.

- (795) Weil die Bautätigkeit ihren Zenit überschritten
 because the construction.activity her zenith cross-PPP
 haben dürfte, rechnet die Branche für das laufende Jahr mit
 have-INF might calculates the branch for the running year with
 einer Abnahme der Lieferungen.¹⁴⁴
 a decline the-GEN export
 ‘Because the construction activity might have reached its peak, the industry expects
 that the exports will decline during the current year.’
- (796) An der Schule selbst wird vor allem deshalb genauestens
 at the school self PASS.AUX above all therefore precisely
 ermittelt, weil der Täter mit dem Klassenzimmer bestens
 investigated because the culprit with the class.room best
 vertraut gewesen sein muss.¹⁴⁵
 familiar be-PPP be-INF must
 ‘The investigations focus on the school because the culprit must have been very fa-
 miliar with the class room.’
- (797) Auch eine Einigung mit den Beamten halte er nur
 also a agreement with the public.servants considers he only
 „hypothetisch“ für möglich, weil das dann wieder
 hypothetically for possible because that then again
 Auswirkungen auf den ASVG- Bereich haben müsste.¹⁴⁶
 effects on the ASVG sphere have-INF must-SBJV.PST
 ‘He considers an agreement with the public servants possible, but only hypothetically,
 because this should have effects on the ASVG-sphere.’

In examples (792)–(797), the matrix clause expresses a presupposed fact and the adverbial clause encodes the cause that brought about this precise fact. In these particular cases, the cause is an assumption which has been made by a referent encoded in the matrix clause: the subject referent’s feeling of guilt had been caused by his assumption about his haircut in example (792); the act of stabbing had been caused by the subject referent’s suspicion in example (793); the subject referent’s reflections about the construction of a heating station are caused by his assumption about the castle in example (794); the subject referent’s calculations about future exports are caused by his assumption about the construction activity in example (795); the investigations led by the agent referent are caused by the assessment of the culprit’s knowledge in example (796) and conclusion drawn by the

144 DeReKo: A08/JAN.02315 St. Galler Tagblatt, 10/01/2008.

145 DeReKo: V99/DEZ.60463 Vorarlberger Nachrichten, 17/12/1999.

146 DeReKo: K00/JUL.50015 Kleine Zeitung, 04/07/2000.

subject referent are caused by his assumption on the effect of the agreement in example (797). Finally, this appears to be the adequate interpretation of example as well (790), where the subject referent of *inhaftieren* ‘arrest’ is identical with the deictic centre of the embedded epistemic modal verb.

Similarly to event-related conditionals, event-related event causal clauses are adjoined to the VP, as pointed out by Uhmann (1998: 108). In this configuration, the arguments of the VP appear to be able to bind the deictic centre variable provided by the epistemic modal operator. As a consequence, these types of event-related *weil*-clauses are interpreted as factive causes which are instantiated by an assumption. The overall structure could be described as CAUSE (ASSUMPTION (P)). Correspondingly, the event expressed by the matrix clause is caused by an assumption. Altogether, these *weil*-clauses behave like canonical event-related causal clauses providing a fact-factive cause interpretation. What ensures that the epistemic modal operators are interpreted in a ‘subjective’ rather than ‘objective’ manner? First of all, all of the modal verbs in (797)–(792) are clearly evaluated with respect to one specifically determined deictic centre. This becomes particularly obvious in examples (792) and (793). In both cases, the matrix predicate is specified for a Topic Time that precedes the Time of Utterance, resulting in past time reference. As was shown in Section 4.3, an epistemic modal operator introduces a further time interval: The Time of Evaluation. In the canonical case, the deictic centre is identified with the speaker, and the Time of Evaluation is anchored to the Time of Utterance. However, in these two aforementioned examples, the Time of Evaluation precedes the Time of Utterance. At first glance, this is surprising because the embedded verbs *könnte* and *dürfte* reflect assessments that are made at the Time of Utterance, in the canonical case. But as these assessments provide the cause of the matrix event, they necessarily have to precede even the Topic Time of the matrix clause. The fact that the Time of Evaluation is shifted to the past is a convincing indicator that some sort of context shift applies here. If those examples involved ‘objective’ epistemic modality, this behaviour would be unexpected, as ‘objective’ epistemic reasoning should be accessible to any epistemic agent at any time. Accordingly, the shift of the Time of Evaluation would remain unaccounted for. This clearly indicates that the epistemic modal operators in the examples discussed above are evaluated with respect to a clearly specified deictic centre, therefore reflecting ‘subjective’ epistemic reasoning. As demonstrated by Papafragou (2006: 1694), English ‘subjective’ epistemic modal auxiliaries can occur in causal clauses with a fact-factive cause reading as well.

However, there are also configurations in which the deictic centre is anchored to the speaker. Again, the matrix clauses in examples (798)–(803) express pre-supposed propositions and not assumptions made by the speaker. This ensures

that the *weil*-clauses under investigation are indeed event-related, rather than epistemic.

- (798) Und weil dieses Lichtspiel am Himmel sich just an
and since this illumination at.the sky REFL just at
Heiligabend dargeboten haben mag, nannten die
christmas present-PPP have-INF may called the
ehrfürchtig-berührten Menschen diesen Ort fortan
reverent-touched people this place henceforth
Bethlehem.¹⁴⁷
Bethlehem

‘(I assume) It was because this illumination has occurred at Christmas, that the reverent and touched people, henceforth, called this place Bethlehem.’

- (799) Weil eben diese Tatsache für viele wichtiger sein
Because just this fact for many more.important be-INF
mag, als sämtliche Veränderungen in der Verwaltung,
may than all changes in the administration
feierten die Haider diesen Aufstieg besonders
celebrated the Haider that promotion particularly
ausgelassen¹⁴⁸
frolicsomenely

‘(I assume) It was because this fact might be more important than any change in the administration that the team from Haid celebrated this promotion in particular frolicsome manner.’

- (800) Weil die Dolmetscherin ihr Deutsch-Studium zeitig
because the interpreter her German.studies early
abgebrochen haben muss, entwickelte sich die
abandon-PPP have-INF must developed REFL the
Pressekonferenz zu einer lustigen Veranstaltung.¹⁴⁹
press.conference to a funny event

‘(I assume) It was because the interpreter had abandoned her studies of German at an early stage that the press conference became a funny event.’

147 DeReKo: A97/DEZ.43149 St. Galler Tagblatt, 24/12/1997.

148 DeReKo: X96/AUG.16359 Oberösterreichische Nachrichten, 14/08/1996.

149 DeReKo: NUN06/JUN.00086 Nürnberger Nachrichten, 01/06/2006.

- (801) Weil der Wähler den Eindruck haben muss, dass die
because the voter the impression have-INF must that the
Sozialdemokraten nicht mehr wissen, was sie wollen, sind sie
social.democrats NEG more know what they want are they
im 20-Prozent-Keller gelandet.¹⁵⁰
in.the 20.percent.cellar landed
'(I assume) It was because the voter had the impression that the Social Democrats do not know anymore what they want, that they ended up in the 20 % cellar.'
- (802) Weil irgendwer den falschen Knopf an seiner
Because someone the wrong button on his
High-Tech-Telefonanlage gedrückt haben mag, steht
high-tech-telephone.switchboard press-PPP have-INF may stands
man plötzlich im telekommunikativen Dunkeln und einer
one suddenly in.the telecommunicative darkness and a
finsteren Sackgasse der Stille.¹⁵¹
gloomy blind.alley the-GEN silence
'Because somebody might have pressed the wrong button on his high-tech telephone switchboard, you find yourself in the darkness of telecommunication and in a gloomy blind alley of silence.'
- (803) Weil der Osterhase diese nette Aktion aber bereits
Because the Easter.bunny this nice action but already
geahnt haben muss, gab es auch schon als kleine
guess-PPP have-INF must, gave it also already as small
Aufmerksamkeit Schoko-Osterhasen für die Kinder, die
attention chocolate.Easter.bunnies for the children which
der Bürgermeister (mit passender eigelbfarbener Krawatte)
the Mayor with corresponding egg.yellow tie
den fleißigen Bastlern überreichte.¹⁵²
the busy makers over.handed
'Because the Easter Bunny must already have guessed the nice activity, there were already chocolate Easter bunnies provided for the children, which were handed over by the Mayor to those busy makers.'

Contrary to the configurations of the first type, examples (798)–(803) do not involve a factive cause but an epistemically possible cause. The speaker uttering example (800) knows that the conference was a funny event. The interpretation of the epistemic modal verb in the adverbial clause deserves closer attention. Evid-

150 DeReKo: HMP08/MAR.01378 Hamburger Morgenpost, 14/03/2008.

151 DeReKo: RHZ98/MAR.02115 Rhein-Zeitung, 02/03/1998.

152 DeReKo: BRZ09/MAR.10889 Braunschweiger Zeitung, 21/03/2009.

ently, it takes scope over the CAUSE operator. The speaker is aware of the funniness of the conference and now he makes assumptions about why it turned out so funny. Finally, he reaches the conclusion that the interpreter must have abandoned her studies of German at an early stage. But in the end, he does not know whether this was indeed the cause of the humorous situation. According to this, the adverbial clause encodes an epistemically modified cause, which can be represented as ASSUMPTION (CAUSE (P)).

It is important to keep these epistemically modified causes apart from epistemic *weil*-sentences. Whereas in the first case the speaker makes a hypothesis *q* about the possible causes for the fact *p*, in the latter case, the speaker provides a justification *q*, which makes him assume the hypothesis *p*. In short, in one case, the matrix clause expresses a fact while the adverbial clause expresses an assumption, providing a fact-hypothetical cause reading, while in the other case, the matrix clause expresses an assumption while the adverbial clause expresses a fact, providing a hypothesis-factive cause reading.

Finally, epistemic modal verbs and causal operators are attested in a third configuration, in which the deictic centre is neither identical to the speaker nor to an argument of the matrix predicate, but coreferential with another salient referent.

- (804) Seine vermeintliche Komplizin muss mit bis zu zehn Jahren
 his putative accomplice has.to with up to ten years
 rechnen, weil sie Menschenhandel zum Zwecke der
 calculate because she human trafficking for sake the-GEN
 sexuellen Ausbeutung in dem Bordell betrieben haben
 sexual-GEN exploitation in the brothel run-PPP have-INF
 könnte¹⁵³
 could

'His alleged accomplice will have to face a prison sentence of up to ten years because (according to the court's assessment) she could have done human trafficking for the purpose of sexual exploitation in a brothel.'

Even if the deictic centre is not explicitly expressed, there is no doubt that the epistemic operator can be attributed to an identified referent. In view of the two types of configurations that have already been discussed, there are two possible interpretations. According to the first type, the epistemic modal does not take scope over the cause operator, resulting in a fact-factive cause reading: The speaker knows that the accomplice will have to face a prison sentence and he knows the cause for this because the court considers it possible that the accomplice might have run an illegal brothel. According to the second type, the epistemic modal

153 DeReKo: RHZ07/AUG.16190 Rhein-Zeitung, 17/08/2007.

takes scope over the cause operator resulting in a fact-hypothetical cause reading: The speaker knows that the accomplice will have to face a prison sentence and he assumes that the cause for this could be that she ran an illegal brothel. Obviously, only the first interpretation is appropriate. Correspondingly, the third configuration also belongs to the fact-factive cause type. The essential difference with respect to the first type discussed above is that the matrix predicate in the third type does not provide an argument which is suitable to be identified with the deictic centre. However, the absence of an appropriate argument does not affect the acceptability of the epistemic modal verb embedded in the *weil*-clause. Instead, the deictic centre is identified with some other referent that is salient in the discourse.

This leads us to the question of how the identification of the deictic centre is guided. Is it guided by particular rules? Is it completely arbitrary? The configuration which involves a suitable matrix argument provides a perfect scenario to decide this question: In case the identification of the deictic centre is completely unrestricted, the presence of a potential attitude holder should not prevent the deictic centre from being co-indexed with a referent different from the one encoded by the matrix predicate. Returning to the fact-factive cause interpretations in examples (792) and (793), it would then be expected that the deictic centre in these examples could be instantiated by some other referent than the one encoded by the matrix subject. However, such an interpretation does not seem to be available. In a similar fashion, the deictic centre always appears to be linked to the speaker whenever an epistemic modal occurs in a matrix clause.

The identification of the deictic centre seems to be arbitrary, as long as there is no other plausible candidate encoded in the respective clause. This is supported by the observation made by Zimmermann (2004: 265) for the discourse particle *wohl*, which cannot take scope out of an embedded clause in the presence of a potential candidate for the attitude holder encoded by some argument in the matrix clause. The precise rules of identification will be addressed more thoroughly in Section 6.

Once more, it turns out that event-related *weil*-clauses can contain epistemic modal verbs that do not belong to the typical exponents of objective epistemic modality, such as *mögen* and *könnte*. This indicates that the assumption of a category of 'objective' epistemic modality might be questionable. In a similar fashion, further elements can be found in event-related *weil*-clauses, which are interpreted with respect to the speaker, e.g. the discourse particle *wohl*, as has been pointed out by Zimmermann (2004: 261). Again, discourse particles such as *wohl* are not elements that are considered to have an 'objective' epistemic interpretation.

- (805) Jeder von den Arbeitern wurde entlassen, weil die Fabrik wohl
 each of the workers was fired since the factory wohl
 dichtgemacht wird.
 make.sealed PASS.AUX

'Each one of the workers was fired since the factory will presumably be shut down.'

The corresponding interpretation for example (805) is the fact-hypothetical cause reading. In an appropriate context, a fact-factive cause would also be possible. Asbach-Schnitker (1977: 48) discusses a similar example of *wohl* in a *weil*-clause. According to her, *wohl* in *weil*-clauses only allows for a fact-hypothetical cause interpretation, a fact-factive cause reading should be ruled out. Likewise, speaker-oriented adverbs are also compatible with *weil*-clauses, such as the epistemic adverb *vielleicht* 'maybe'. They can occur in event-related *weil*-clauses conveying either of the two interpretations, as the following example given by Roland Schäfer (pers. commun.) illustrates:

- (806) Weil Peter vielleicht das Eis aufgegessen hat, hat ihn
 Because Peter maybe the ice.cream eaten has has him
 Maria verprügelt.
 Maria bashed

'Because Peter has possibly eaten all of the ice cream, Maria bashed him'

'I assume that it was because Peter has eaten all of the ice cream that Maria bashed him'

As pointed out by Roland Schäfer (pers. commun.), some speakers get a third interpretation, in which the epistemic adverb *vielleicht* takes scope over the matrix clause as well, resulting in a hypothesis-hypothetical cause reading. In this case of *Schäfer*-raising, the epistemic adverb acts as a modifier of the matrix clause.

Inspired by examples provided by Lang (1979: 210), Nuyts (2001a: 78) has pointed out that epistemic adjectives and adverbs can occur in German *weil*-clauses. According to him, each of them prefers a different interpretation.

- (807) Peter trinkt noch einen Schnaps, weil es wahrscheinlich ist,
 Peter drinks more one schnaps because it probable is
 daß er süchtig ist.
 that he addicted is

'Peter drinks another schnaps because it is probable that he is addicted'

- (808) Peter trinkt noch einen Schnaps, weil er wahrscheinlich
 Peter drinks more one schnaps because he probably
 süchtig ist.
 addicted is

'Peter drinks another schnaps because he is probably addicted'

As Nuyts (2001a) assumes, epistemic adjectives are more likely to obtain a fact-factive cause reading (cf. 807), whereas epistemic adverbs, being obligatorily interpreted with respect to the speaker, are restricted to a fact-hypothetical cause reading (cf. 808).

As already demonstrated in example (806), Nuyts' assumptions are wrong as there are adverbs that exhibit a fact-factive cause interpretation.

To sum up, it has been shown that 'subjective' epistemic operators are available in an environment from which they are expected to be banned. Embedded in event-related *weil*-clauses, which are part of a fact-factive cause configuration, they will typically induce a context shift. Whenever the matrix predicate introduces an appropriate argument, the deictic centre will share the same index. Otherwise, the deictic centre will be identified with some other referent that is salient in the discourse.

At this point, the question arises why epistemic modal operators that are embedded in adverbial clauses are acceptable in some cases while they are not in others. The easiest solution is probably to assume that different types of epistemic modal operators are involved: Whenever they obtain an ungrammatical interpretation, they are 'true subjective' epistemic modal operators; whenever they are not, they have to be something else, eg. 'objective' epistemic modal operators. But as has been pointed out above, things are not as simple. There are numerous types of canonical 'subjective' epistemic operators which are attested in embedded clauses. Therefore, it becomes necessary to seek an alternative explanation. In the analysis developed here, it is assumed that epistemic operators introduce a variable for a deictic centre. In order to obtain a grammatical interpretation, the deictic centre has to be identified with a referent. This process of identification underlies clear rules. Whenever the identification of the deictic centre conforms to these rules, the embedded epistemic modal operator can be interpreted; in any other case, the interpretation fails and the entire sentence is ungrammatical. Again, it turns out that the assumption of an independent sub-category 'objective' epistemic modality does not neatly account for the phenomenon of embedded epistemic modal operators.

4.17 Excluded from the antecedent of an event-related conditional

Lyons (1977: 799, 805) assumes that epistemic modal verbs are possible in the antecedent of a conditional, as long at least they obtain an 'objective' interpretation.

(809) If it may be raining, you should take your umbrella.

Nevertheless, he concedes that utterances of this type are “undoubtedly rare in English”. The reason for this is that objective epistemic modality is expressed by other lexical means than verbs, for example patterns such as ‘it is possible that’. Subjective epistemic modality, however, is excluded from conditional clauses. This position is adopted by Aijmer (1978: 164), Drubig (2001: 11) and Papafragou (2006: 1690, 1697) for English, by Öhlschläger (1989: 209) for German, by Huitink (2008: 8 ex. 22) for Dutch, by Nuyts (2001a: 211) for German and Dutch, and by Hengeveld (1988: 236) for Spanish.

Öhlschläger (1989: 209) argues that the acceptable example in (810) contains an ‘objective’ epistemic instance of a German modal verb. Following his perspective, the only modal verb in German that unambiguously involves a ‘subjective’ epistemic interpretation is *mögen*. Accordingly, Öhlschläger (1989) concludes that the ungrammaticality of example (811) is caused by the illicit presence of a subjective epistemic modal verb, which cannot be ‘objective’ otherwise. In German, conditional clauses are most typically headed by the complementiser *wenn*:

- (810) Wenn der Angeklagte der Täter sein muß/dürfte/kann,
if the accused the culprit be-INF must/might/can
wird er inhaftiert.¹⁵⁴
PASS.AUX he arrested

‘If there are reasons to believe that the accused is the culprit, he will be arrested.’

- (811) * Wenn der Angeklagte der Täter sein mag, wird er
if the accused the culprit be-INF may PASS.AUX he
inhaftiert.¹⁵⁵
arrested.

‘If there are reasons for me to believe that the accused is the culprit, he will be arrested.’

But as has been shown on various occasions in the previous section, Öhlschläger’s reasoning lacks empirical justification. First of all, epistemic *mögen* is attested in a lot of environments from which an ‘objective’ epistemic modal should be banned. Secondly, *mögen* is a modal verb that is not very frequent in Contemporary German, and that typically comes with a complex concessive meaning, which in turn requires a particular context. The reason why example (811) is less acceptable than example (810) might rather be due to its specific lexical semantics.

¹⁵⁴ The acceptability judgements reflect those found in Öhlschläger (1989: 209). The translations given by myself reflect more or less his perspective.

¹⁵⁵ The acceptability judgements reflect those found in Öhlschläger (1989: 209). The translations given by myself reflect more or less his perspective.

Generally speaking, epistemic modal verbs which are embedded in an antecedent of an event conditional are fairly hard to find in corpora.¹⁵⁶ Interestingly, the investigated items *dürfte*, *kann*, *könnte*, *mag* and *wird* are almost equally rare in this type of context. This confirms the view held by Lyons (1977: 806), who noticed that these uses are “undoubtedly rare”. Interestingly, there seems to be no considerable difference in the behaviour of those verbs which are considered as typical exponents of ‘objective’ epistemic modality, such as *kann* and *dürfte*, and those verbs that have not been regarded as ‘objective’ epistemic so far, such as *mag*, *könnte* and *wird*. Once more, this is unexpected for an account that assumes a division of epistemic modality into an objective and subjective type.

The occurrences found in the corpus are almost exclusively embedded in antecedents of *even if*-clauses, irrelevance conditionals and related phenomena. According to Sweetser (1990: 133), *even if*-clauses crucially differ from canonical conditionals in that the consequent always remains true even if the antecedent does not hold. Moreover, they also exhibit semantic peculiarities in that they additionally convey a concessive meaning.

- (812) Wenn die Regierung zunächst noch geglaubt haben mag, mit
 if the government first still believe-PPP INF may, with
 einem raschen Abschluß der Gehaltsrunde bei den
 a quick completion the-GEN collective.bargaining at the
 Beamten die ausufernde Malaise im öffentlichen Bereich
 civil.servant the abundant malaise in.the public sector
 eindämmen zu können, so muß sie nun die anhaltende
 contain-INF to canINF so must she now the persistent
 Verhärtung an der Sozialfront zur Kenntnis nehmen.¹⁵⁷
 rigidification at the social.front at knowledge take-INF
 ‘If the government may first have thought that it could have contained the abundant
 malaise in the public sector, they now have to acknowledge the persistent rigidifica-
 tion at the social front.’

156 The corpus study focused on epistemic uses of *dürfte*, *könnte* and *kann*. Since modal verbs that embed perfect infinitives are most likely to be interpreted in an epistemic way, the queries were formulated accordingly: “wenn /+w5:15 (MORPH(V PCP PERF) sein dürfte)” and “wenn /+w5:15 (MORPH(V PCP PERF) haben dürfte)”.

The study encompassed the entire *W-TAGGED-öffentlich* archive of the DeReKo corpus.

157 DeReKo: P91/OKT.05347 Die Presse, 24/10/1991.

- (813) Wenn es irgendwann einmal echte Einsparmöglichkeiten wegen
 if it sometime once true economise.possibilities due.to
 unwirtschaftlichen Verhaltens gegeben haben mag, so sind
 uneconomical behaviour give-PPP have-INF may, so are
 diese nach so vielen Jahren längst ausgeschöpft.¹⁵⁸
 they after so many years long.ago exploited
 'If there has been any real potential for economising due to uneconomical behaviour,
 they have already been exploited after so many years.'
- (814) Wenn jemand noch Zweifel gehabt haben mag, daß die
 if anybody still doubt have-PPP have-INF may that the
 Europäische Union Österreich unbedingt als neues Mitglied
 European Union Austria necessarily as new member
 begrüßen will, so kann er diese jetzt begraben.¹⁵⁹
 greet wants so kann he these now bury
 'If anyone may have doubted the European Union accepting Austria as a new member
 at any rate, they needn't entertain them further.'
- (815) Wenn es dem Orchester schon schwer gefallen sein mag, das
 If it the orchester already hard fall-PPP be-INF may the
 Konzert fortzuführen, so ist vor allem Monika
 concert to.continue-INF so is above all Monika
 Baumgartners Vorstellung bemerkenswert, mit der sie in
 Baumgartner-GEN performance remarkable with the she in
 Mozarts Motette „Exsultate, jubilate“ ihren Solopart
 Mozart-GEN motette exsultate jubilate her solo.part
 meisterte¹⁶⁰
 mastered
 'If it may have been hard for the orchestra to continue the concert, it is Monika
 Baumgartner's performance in particular that merits attention in which she mastered
 Mozart's motettes.'

According to Sweetser (1990: 123), Kratzer (1995: 130) and Haegeman (2002: 117) there are different types of conditionals which should carefully be distinguished: content/event-related conditionals, epistemic conditionals, and speech act conditionals, as was shown in Section 3.4.1. This differentiation also applies to German conditional clauses headed by the complementiser *wenn*. The ban on epistemic modal operators in antecedents was evidently developed with respect to event-related conditionals only; a similar observation was made by Haegeman

¹⁵⁸ DeReKo: RHZ08/MAR.19805 Rhein-Zeitung, 25/03/2008.

¹⁵⁹ DeReKo: N94/MAR.08289 Salzburger Nachrichten, 05/03/1994.

¹⁶⁰ DeReKo: RHZ08/NOV.22367 Rhein-Zeitung, 25/11/2008.

(2002: 126) and Haegeman (2006: 1652) for speaker oriented adverbs. In the antecedent of epistemic and speech act conditionals, however, speaker oriented operators are possible. All of the conditional clauses in examples (812)–(815) behave in a particular way, insofar as the proposition expressed by the antecedent is presupposed or factive. As illustrated by Fabricius-Hansen and Sæbø (1983: 2), this behaviour is atypical of conditional clauses. The unambiguous conditional complementisers *falls* and *sofern* are not compatible with such an environment. As Haegeman (2002: 121, 126) and Eisenberg (2004: 346) state, conditional clauses that involve echoic antecedents cannot be considered as canonical event conditionals; rather they are peripheral or premise conditionals, which are closely related to, or even identical with, epistemic or speech act conditionals.¹⁶¹ Likewise, Declerck and Reed (2001: 83) point out that echoic antecedents always contain an element of ‘suspending disbelief’ regarding the validity of their proposition. This is reminiscent of epistemic modifiers. For these reasons, the examples given above cannot be regarded as counter-examples to the restriction formulated by Lyons (1977: 806).

Finally, *wenn*-clauses in German introduce an additional layer of ambiguity: As Fabricius-Hansen and Sæbø (1983: 2) point out in great detail, the complementiser *wenn* can also head temporal adverbial clauses that express a partial simultaneity of the matrix Topic Time and the Topic Time of the adverbial clause of a single or repeated event. However, these cases can easily be identified, since *when* can be replaced with the temporal complementisers *sobald* or *sooft*, as will be illustrated in Section 4.18. Despite the multiplicity of interpretations, there are few examples of epistemic modals that occur in the antecedent of a potential event-related conditional. Interestingly, they are all attested with *könnte*, which is a verb that is not regarded as a typical exponent of objective epistemic modality.

- (816) Wenn der Täter bewaffnet sein könnte, würde ich jedoch
if the offender armed be-INF could would I but
dringend abraten.¹⁶²
strongly advise-INF
‘If the offender could be armed, I would strongly advise against it.’

¹⁶¹ The distinction appears to be intricate, as *falls* and *sofern* are attested as complementisers of both epistemic and speech act conditionals, as is shown in Section 3.4.1. But they appear to be less compatible with echoic antecedents, as Fabricius-Hansen and Sæbø (1983: 2) emphasise. The precise relationship between these two aspects remains to be developed.

¹⁶² DeReKo: RHZ96/OKT.04492 Rhein-Zeitung, 08/10/1996.

- (817) Es besagt, dass eine in die Schweiz geflüchtete Person nicht in
 it says that a in the Switzerland fled person NEG in
 ihr Ursprungsland zurückgeschafft werden darf, wenn sie
 his origin.country back.delivered PASS.AUX-INF may if she
 dort an Leib und Leben bedroht sein könnte.¹⁶³
 there at body and life threaten-PPP be-INF could
 'It says that a person who has fled to Switzerland must not be returned to his original
 country if he could be physically threatened there.'
- (818) Wenn in einem Unfall die Trunkenheit eine Rolle gespielt
 if in an accident the drunkenness a role play-PPP
 haben könnte, so sind Folgen auch bei einem
 have-INF could so are consequences also with a
 Alkoholgehalt von unter 0,5 Promilie möglich.¹⁶⁴
 alcohol.percentage of less 0.5 promille possible
 'If it is possible that the cause for an accident was drunkenness, then it is possible
 that there will be consequences even if the percentage of alcohol was less then 0.5
 promille.'

Examples such as (816) are fully acceptable and they involve plausible candidates for event-related conditional clauses. First of all, in each case the antecedent is non-echoic. Secondly, the replacement tests discussed by Fabricius-Hansen and Sæbø (1983: 2) succeed: In all cases, *wenn* can be replaced with less ambiguous conditional complementisers such as *falls* and *sofern*. The replacement by complementisers which are synonymous with the temporal interpretation of *wenn*, such as *sooft* or *sobald*, will obtain a result that is less acceptable.

As for the anchoring of the deictic centre, epistemic modal verbs embedded in event-related conditional clauses crucially differ from most other adverbial clauses investigated here. Whereas epistemic modal operators in event-related causal clauses and temporal clauses are typically linked to the speaker, or in some cases to a matrix argument, the epistemic modal verbs in the three *wenn*-clauses are anchored to the addressee. This is most obvious in example (816). The remaining examples are more complex. As with the matrix clause in example (816), the matrix clauses in example (817) and example (818) reflect an advice or regulation. However while the addressee of that advice is the hearer in example (816), the addressee of the advice is not present in the utterance situation in the other two examples. Interestingly, this is reminiscent of the way the modal source of a circumstantial modal verb is anchored. As Leech (1971: 72) illustrated,

¹⁶³ DeReKo: A09/FEB.06666 St. Galler Tagblatt, 24/02/2009.

¹⁶⁴ DeReKo:WPD/TTT.07396, Wikipedia, 2005.

the modal source typically tends to be identified with the speaker in declarative clauses, but it is identified with the addressee in questions and antecedents of conditionals. The parallel behaviour of interrogative clauses and antecedents of conditional clauses is exactly what is expected, as there is a systematic relation between these two types of clauses, as has been demonstrated by Traugott (1985), Zaefferer (1987), Bhatt and Pancheva (2006: 653) and Reis and Wöllstein (2010: 133–135). The analysis presented here equally captures the examples in (810) provided by Öhlschläger (1989: 209). Though being more opaque, example (818) could be interpreted in a similar way, if it is felicitous at all.

The examples given above involve an additional peculiarity. Canonical event conditionals establish a relation between two events: ‘If you drop that bottle, it will break.’ However, this is not the case in the examples above. The matrix clause is not interpreted as a mere assertion of a state of affairs, but rather as an advice or directive. Note that a modified matrix clause could be easily replaced with an imperative without affecting the interpretation too much: ‘If the offender is armed, let him go!’ This could be an indicator that the *wenn*-clauses modify the entire speech act in examples (816)–(818).

These two observations cast some serious doubt on the assumption that the conditionals in the examples above could really be considered as genuine event-related conditionals. It is fairly likely that the conditionals under discussion here turn out to be speech act conditionals. As it seems to me, there is no clear proof that reveals the opposite, these patterns will not be considered as event conditionals in this study.

However, there is one other type of data, in which the conditional is embedded in a hypothetical context (potentialis).

- (819) Am Ende könnte die Linkspartei über solche Bündnisse
 at.the end can-SBJV.PST the Linkspartei by such alliances
 ein starker Faktor im Bundesrat werden – und dies
 a strong factor in.the Federal.Council become and this
 wäre vor allem von Gewicht, wenn die Bundesregierung
 be-SBJV.PST of all of weight if the government
 nach der Bundestagswahl schwarz-gelb geprägt sein
 after the election black-yellow coin-INF be-INF
 könnte.¹⁶⁵
 can-SBJV.PST

‘Finally, the Leftwing-party could become a strong factor in the federal council due to such alliances – this would become important if after the next elections the government could be lead by a black-yellow coalition.’

¹⁶⁵ DeReKo: HAZ09/AUG.02799 Hannoversche Allgemeine, 18/08/2009.

Example (819) is perfectly acceptable. It deserves closer attention that it is embedded in a hypothetical context, which is illustrated by the fact that each finite verb is inflected for past subjunctive. As can be seen, the acceptability of that example hinges on the specification for subjunctive, as it would become less grammatical if the subjunctive were replaced by indicative morphology. There is no obvious reason to assume that the epistemic modal verb in example (819) is not 'subjective', since it has to be more plausibly interpreted as a conjecture made by the speaker. It seems, then, that hypothetical contexts licence epistemic modal operators in antecedents of event-related conditionals. In these contexts, it appears to be possible for the deictic centre to be identified with the speaker.

Do, thus, event-related conditionals provide any evidence for the existence of objective modals? Under extremely specific conditions, antecedents of event-related conditionals can embed epistemic modal verbs. An interpretation with a deictic centre identical to the speaker is possible in a hypothetical context, as illustrated in example (819). Since hypothetical contexts introduce additional operators, their precise interaction yet remains to be thoroughly investigated.

Likewise, the relevant examples given by Lyons (1977: 805) and Papafragou (2006: 1692) provide no evidence for the existence of objective epistemic modification. First of all, as demonstrated above, the conditional in example (809) exhibits a striking resemblance with conditionals that modify directive speech acts, such as imperatives: 'If it may be raining, take an umbrella!'. The close functional relationship between the modal *should* (and its correlates in German) and directives has been pointed out on various occasions, cf. Glas (1984: 10), Reis (1995) and Reis (2003). If these examples do indeed turn out to be speech act conditionals, their acceptability can easily be accounted for. Since antecedents of epistemic and speech act conditionals are far less restrictive than those of event-related conditionals, they can even host speaker related operators. In this respect, example (819) resembles examples (816)–(818). Moreover, the antecedent is evidently specified for the present and is echoic, that is, it refers to an utterance which has already been stated by somebody else in prior discourse. As indicated by Fabricius-Hansen and Sæbø (1983: 8), Declerck and Reed (2001: 83), Haegeman (2002: 121, 126) and Eisenberg (2004: 346), both properties are clear indicators that the conditional is not an event-related one. A similar reasoning applies to the example provided by Papafragou (2006: 1696) given in (820): The antecedent seems to become more acceptable if it is interpreted as echoic. This also holds for the corpus examples provided by Hacquard and Wellwood (2012: 7) shown in example (821):

(820) If Paul may get drunk, I am not coming to the party.

(821) Yet if his credibility might have been in jeopardy before, it most certainly is now.

Once more, the discourse particle *wohl* seems to pattern in the very same way as epistemic modal verbs. First of all, Zimmermann (2004: 265) observes that it is not acceptable in antecedents of event-related conditionals.

- (822) * Wenn der Smutje wohl betrunken ist, gibt es heute keinen
 if the smutje wohl drunk is gives it today no
 Labskaus.
 Labskaus

‘Intended reading: If the cook is presumably drunk (as I assume), there will be no Labskaus.’

Secondly, it frequently occurs with *even if*-clauses and other types of so-called irrelevance conditionals. Thirdly, it is conceivable that *wohl* occurs even in antecedents of event-related conditionals analogous to examples (810) and (817).

In a similar fashion, Haegeman (2006: 1652) reports that speaker oriented adverbs cannot be embedded in event-related conditionals. Then, the general picture is that operators which involve a deictic centre seem to be almost excluded from antecedents of event-related conditionals. The reason is obvious: The deictic centre has to be identified with some referent. This process of identification, however, is not arbitrary but driven by specific principles. Whenever an epistemic operator is contained by an embedded complement or adverbial clause, it is harder to retrieve a suitable candidate that can be identified as a deictic centre. If there is no plausible way to provide a deictic centre for the embedded epistemic modal operator, the utterance is ungrammatical.

The incompatibility of epistemic modal verbs with antecedents of event-related conditionals might also be related to an observation made by Kratzer (1995: 130), who has pointed out that event-related *when*-clauses in English are not suitable hosts for stative verbs. Since modal predicates encode states of beliefs they might be affected by this restriction as well.

4.18 Excluded from temporal clauses

Aijmer (1978: 164) argues that epistemic modal auxiliaries in English cannot be embedded in temporal clauses. This is a very general restriction, as there are many different types of temporal subordinators. The purpose of temporal adverbial clauses is to relate two time intervals: The Topic Time determined by the event expressed by the adverbial clause and the Topic Time determined by the event expressed by the matrix clause. There are different instantiations. According to Eisenberg (2004: 339), the most important temporal subordinating conjunctions for German are: *nachdem* ‘after’ expressing the posteriority of the matrix Topic

Time; *bevor* ‘before’ anteriority of the matrix Topic Time; *während* ‘while’ expressing a simultaneity or temporal overlap of the matrix Topic Time and the Topic Time conveyed by the temporal clause; *als* ‘when’ expressing a simultaneity or temporal overlap of these two Topic Time intervals that are located prior to the Time of Utterance and; finally, *wenn* ‘when’, which also expresses a simultaneity or temporal overlap of these two Topic Time intervals without specifying whether this simultaneity has occurred only once or occurs generically. Furthermore, there are a couple of temporal conjunctions that behave in a slightly different way. An adverbial temporal clause headed by *bis* ‘until’ expresses a potential termination of the state of affairs expressed by the matrix clause. In contrast, adverbial clauses headed by *seit* and *seitdem* ‘since’ refer to the beginning of the state of affairs expressed by the matrix clause.

As it turns out, epistemic modal verbs are only rarely attested in temporal clauses in the German DeReKo corpus.¹⁶⁶ The precise frequency of these occurrences depends on the type of temporal clause and on the specific epistemic modal verb. Unfortunately, a corpus study of these elements is complicated. Most of the subordinators that introduce temporal clauses are ambiguous. Aside from the temporal interpretation, they often involve an additional causal, contrastive, conditional or comparative interpretation, depending on the respective lexical item. Similar observations about potential ambiguities of temporal conjunctions have been made by Eisenberg (2004: 339) and Coniglio (2008: 195) for German, and by Haegeman (2002: 137, 142) for English. It is necessary to distinguish between the different interpretations since, in some cases, they come with very different syntactic properties. As demonstrated by Haegeman (2002: 137, 142), *while* in its temporal interpretation heads an event-related (central) adverbial clause, whereas it heads a speech act related (peripheral) adverbial clause in its contrastive interpretation. This was discussed in more detail in Section 3.4.5. Similar effects can be observed with other temporal conjunctions as well. In the investigation discussed here, these non-temporal interpretations are carefully kept apart.

Apart from the expression of the posteriority of matrix Topic Time, *nachdem* ‘after’ additionally involves an event-related causal interpretation. However, in its temporal use, it rarely heads an adverbial clause that contains an epistemic modal verb:

¹⁶⁶ The investigation was carried out in July 2011. Since the majority of epistemic modal verbs select stative complements, in particular *sein* and *haben*, the study was based on queries such as ((, ODER .) bis) /+w15 (sein könnte) ((, ODER .) seit) /+w15 (haben dürfte). The investigation involved each type of epistemic modal verb, either type of stative predicate and all of the temporal subordinators discussed above.

- (823) Der 15 Monate alte Christoph I. fiel in den umzäunten Teich
 the 15 months old Christoph I. fell in the fenced pond
 vor dem Elternhaus, nachdem er selbst das Tor des
 in.front.of the parental.home after he self the gate the-GEN
 Zaunes geöffnet haben dürfte.¹⁶⁷
 fence-GEN open-PPP have-INF might
 'The 15-months old Christoph I fell in the fenced pond in front of the parental home
 after he may have opened the gate of the fence by himself.'
- (824) Im Frauenwieserteich ertrank am 19. August 2001 ein
 in.the Frauenwieserteich drowned on 19 August 2001 a
 16-jähriges Mädchen, nachdem es beim Schwimmen in Panik
 16.year.old girl after it at swim-INF.NOUN in panic
 geraten sein dürfte.¹⁶⁸
 get-PPP be-INF might
 'A 16 year old girl drowned on 19th August in the Frauenwieserteich after possibly
 panicking while swimming.'
- (825) Sie soll mit falschen Fünfzig-Euro-Scheinen mehrfach in der
 she shall with false fifty.Euro.bills repeatedly in the
 Siegstadt eingekauft haben. Dies, so der Vorwurf, auch nachdem
 Siegstadt shop-PPP have-INF this so the reproach also after
 sie gewusst haben muss, dass es sich um
 she know-PPP have-INF must that it REFL about
 Blüten handelte.¹⁶⁹
 counterfeit.money dealt
 'She is claimed to have repeatedly paid in Siegstadt with false fifty Euro bills. Al-
 legedly, she continued doing so even after she must have known that they were coun-
 terfeit money.'

As already illustrated in Sections 4.3 and 4.16, epistemic modal operators introduce an additional time interval: The Time of Evaluation, in which the deictic centre evaluates the embedded proposition with respect to its validity. In the canonical case, the function of a temporal conjunction is to relate the Topic Time of the matrix clause to the Topic Time of the temporal clause. Since the Time of Evaluation introduced by an epistemic modal operator always takes scope over the Topic Time provided by the embedded predicate, it is not obvious which time interval will be affected when a temporal clause embeds an epistemic modal verb, the Topic Time of the predicate or the Time of Evaluation.

167 DeReKo: O94/JUL.61763 Neue Kronen-Zeitung, 03/07/1994.

168 DeReKo: NON07/AUG.03400 Niederösterreichische Nachrichten, 08/08/2007.

169 DeReKo RHZ04/APR.11451 Rhein-Zeitung, 14/04/2004.

In the examples given above, *nachdem* always refers to the Topic Time of the adverbial clause but never to the Evaluation Time specified by the modal verb. In its temporal use, a clause headed by *nachdem* specifies some time interval prior to the Topic Time of the matrix clause. In example (823), this time interval is clearly the one for which it is assumed that Christoph opened the door himself, rather than the one in which the deictic centre makes the assumption about Christoph. Nevertheless, the interpretation of these examples remains somewhat peculiar, since they involve a matrix Topic Time that is related to a Topic Time that is not linked to any factive event or state. The deictic centre does not know whether the event related to the Topic Time of the temporal clause really exists. As for most of the examples discussed above, the identification of the deictic centre is fairly obvious: It is anchored to the speaker. This is not so clear for example (825), which contains a reported reproach. In this context, the original assumption is attributed to a referent who is different from the actual speaker. But as the entire clause is in the scope of the parenthesis *so der Vorwurf* ‘according to the reproach’ it becomes clear that this is another instance of context shift. What is attributed to the third referent is not only the assumption but the entire utterance, the entire speech act. Accordingly, the parenthesis marks the clause as having been uttered by another speaker. In this original utterance, the speaker and the deictic centre introduced by the modal verb are again identical.

Aside from its event-related temporal interpretation that expresses the anteriority of the matrix Topic Time, *bevor* ‘before’ alternatively operates on the speech act level. In the latter case, it obviously expresses the anteriority of the matrix Time of Utterance with respect to the Topic Time linked to a potential event in the future; similar observations have been made by Coniglio (2008: 195), as shown in Section 3.4.7. Event-related *bevor*-clauses that contain epistemic modal verbs are very hard to find in the DeReKo corpus. Nevertheless, they exist.

- (826) Anfangen hat es in Minute 30, als der Ball zweimal
 began hat it in minute 30 when the ball two.times
 auftickte, bevor Torwart Frank Maximini sich wie der
 up.jumped before goal.keeper Frank Maximini REFL as the
 zweite Teil seines Nachnamens geföhlt haben dürfte.¹⁷⁰
 second part his-GEN family.name-GEN feel-PPP have-INF might
 ‘It began after 30 minutes, when the ball jumped twice, before the goal keeper Frank
 Maximini must have felt like the second part of his family name.’

170 DeReKo: RHZ97/SEP.03529 Rhein-Zeitung, 05/09/1997.

- (827) Ich wollte noch rechtzeitig alles Wissenswertes aus der
 I wanted yet in.good.time everything worth.knowing of the
 Geschichte unserer Gemeinde aufschreiben, bevor es vielleicht
 history our-GEN community down.write before it maybe
 zu spät sein könnte¹⁷¹
 too late be-INF could

'I just wanted to write down the most important facts about the history of our community before it may be too late.'

- (828) Doch auch wenn alles gutgeht, werden mehr als fünf
 but even if everything good.goes will more than five
 Jahre sowie 75 Flüge zu der „Großbaustelle im Weltraum“
 years as.well 75 flights to the construction.site in.the space
 vergehen, bevor das spektakulärste Gemeinschaftsprojekt
 pass before the most.spectacular common.project
 der Wissenschaftsgeschichte im Juni des Jahres
 the-GEN science.history in.the June the-GEN year-GEN
 2002 zusammengebaut sein könnte.¹⁷²
 2002 assemble-PPP be-INF could.

'Even if everything goes well, more than five years and 75 flights to the "construction site in space" will elapse before the most spectacular joint project in the history of science may possibly be assembled in June 2002.'

Once again, the relevant time interval that is affected by the subordinate conjunction *bevor* is the Topic Time of the temporal clause, rather than the Time of Evaluation introduced by the epistemic modal verb. In example (827), the interval that is interpreted as being located after the matrix Topic Time is the time 'when it is too late', rather than the Time of Evaluation, when the deictic centre reaches the conclusion that it is possibly too late. As in the cases of *nachdem*, the deictic centre is anchored to the speaker referent.

In the canonical case, *während* indicates simultaneity or an overlap of the matrix Topic Time and the one attributed to the temporal clause. However, it is also frequently used as a contrastive conjunction, just as its English counterpart *while*. In the DeReKo corpus, only one example of a temporal *während*-clause with an epistemic modal verb is attested which selects a past related complement. Its precise status remains unclear.

¹⁷¹ DeReKo: RHZ05/JUL.10477 Rhein-Zeitung, 09/07/2005.

¹⁷² DeReKo: RHZ97/JAN.02587 Rhein-Zeitung, 07/01/1997.

- (829) Im Lokal habe er – während er reichlich Alkohol getrunken
 in.the bar has he while he abundantly alcohol drink-PPP
 haben dürfte – bereitwillig jedem Gast seine Waffe gezeigt.¹⁷³
 have-INF might voluntarily every guest his weapon show-PPP
 ‘In the bar he showed everybody his weapon while he (presumably) drank alcohol in
 abundant quantities.’

Again, the temporal conjunction concerns the Topic Time of the temporal clause, rather than the Time of Evaluation introduced by the epistemic modal verb and again, the deictic centre is identified with the speaker.

Yet, it is not clear whether the clause headed by *während* in example (829) is indeed temporally subordinate, or rather to be seen as a parenthesis. Coniglio (2008: 195) discusses a similar instance of a *während*-clause that contains the discourse particle *wohl*, provided by Asbach-Schnitker (1977: 48), concluding it is a non-restrictive relative clause that cannot be considered as a temporal adverbial clause.

Aside from its temporal interpretation, *als* can also head comparative clauses. In the DeReKo corpus, temporal uses that contain epistemic modal verbs are hardly attested.

- (830) Danach habe ihn die Frau beispielsweise in den Hals
 accordingly has him the woman for.instance in the throat
 gebissen, als es nach einem heftigen Streit zu tätlichen
 bite-PPP when it after a fierce argument to violent
 Auseinandersetzungen gekommen sein dürfte.¹⁷⁴
 hassle come-PPP be-INF might
 ‘Accordingly, the woman bit him in the throat when a fierce argument presumably
 ended up in a violent fight.’

As in the other cases, the relevant interval for the interpretation of temporal conjunction *als* is the Topic Time of the temporal clause rather than the Time of Evaluation of the modal verb. Likewise, the deictic centre is anchored to the speaker.

Among temporal clauses that contain epistemic modal verbs, *bis*-clauses are the most frequently attested. This might have pragmatic reasons. Temporal *bis*-clauses typically refer to a time interval in the future. Since the future is less clear and based on rather unstable predictions, it is much more compatible with a kind of reasoning as reflected by an epistemic modal operator.

¹⁷³ DeReKo: N98/SEP.34596 Salzburger Nachrichten, 08/09/1998.

¹⁷⁴ DeReKo: M06/MAR.22418 Mannheimer Morgen, 24/03/2006.

- (831) Außerdem wird es noch Jahre dauern, bis die Brücke
 moreover will it yet years last until the bridge
 verwirklicht sein könnte.¹⁷⁵
 realise-PPP be-INF could
 ‘Moreover it will take years until the bridge may be realised.’
- (832) Keiner guckt auf die Uhr, bis plötzlich – huch! – irgendwer
 nobody watches at the clock until suddenly oops somebody
 daran gedreht haben muss, und dann geht es hopplahopp.¹⁷⁶
 on.it turn-PPP have-INF must and then goes it hopplahopp
 ‘Nobody cares about the clock until – oops! – someone must have turned it on and
 then it goes hopplahopp.’
- (833) Und noch immer bewegt sich diese Düne näher an den Turm
 and still always moves REFL this dune closer to the tower
 heran, bis er wohl in ein paar Jahren völlig versandet
 towards until he maybe in a couple years completely silt-PPP
 sein dürfte.¹⁷⁷
 be-INF might
 ‘And the dune keeps moving towards the tower until, in a couple of years, it may be
 entirely silted.’

Again, the temporal conjunction *bis* ignores the Time of Evaluation introduced by the epistemic modal operator. Instead, it is, again, the Topic Time of the temporal clause that serves as the temporal reference point for the matrix Topic Time. In correspondence with the behaviour of the temporal clauses discussed so far, the deictic centre is instantiated by the speaker referent in these examples.

Temporal *seit*-clauses that embed epistemic modal verbs occur at a very low rate in the DeReKo corpus:

- (834) Aber Frust habe er auch wieder keinen, Zumindest seit
 but frustration have he also again none at.least since
 Silverstone nicht, obwohl ihn das Pech verfolgt, seit
 Silverstone NEG even.though him the misfortune follow since
 er mit dem verbesserten Benetton technisch wie fahrerisch auf
 he with the enhanced Benetton technically as driver.cally on
 der Überholspur sein könnte.¹⁷⁸
 the overtaking.track be-INF could
 ‘Again, he does not feel frustrated with respect to his driving skills, at least since Sil-
 verstone, even though he was not lucky from the time onwards since he may be on

175 DeReKo: RHZ05/JUL.15241 Rhein-Zeitung, 13/07/2005.

176 DeReKo: A09/SEP.06557 St. Galler Tagblatt, 19/09/2009.

177 DeReKo: N93/OKT.38960 Salzburger Nachrichten, 23/10/1993.

the overtaking track with his enhanced Benetton with respect to his driving skills and the technical equipment.’

- (835) Es ist derzeit allgegenwärtig, seit das Land seine Pläne zu einer it is currently omnipresent since the state its plans to a Gebietsreform vorgestellt hat und Rhens betroffen sein reform presented has and Rhens concern-PPP be-INF könnte.¹⁷⁹ could

‘It is currently omnipresent since the time when the state presented its plans for a reform of the local government and Rhens could be concerned.’

In correspondence with the patterns discussed so far, the temporal conjunction *seit* refers to the Topic Time of the temporal clause, rather than the Time of Evaluation that is introduced by the epistemic modal verb. The deictic centre is anchored to the speaker referent.

Finally, a couple of instances of epistemic modal verbs could be found that occur in *wenn*-clauses which are potentially interpreted as temporal clauses. They display similar properties as generic temporal *wenn*-clauses referring to repeated events. Correspondingly, the replacement with synonymous temporal conjunctions (*sobald*, *sooft*) obtains far more appropriate results than the replacement with conjunctions that reflect the conditional semantics (*sofern*, *falls*), as has been illustrated by Fabricius-Hansen and Sæbø (1983: 2).

- (836) „Wenn etwas los sein könnte, rufen die hier an und whenever something slack be-INF could call they here on and machen uns die Hölle heiß“, heiße es bei einem make us the hell hot call-SBJV.PRS it at a Dax-Konzern.¹⁸⁰ DAX-concern

‘“Whenever it appears that something is going on, they call us and give us hell” that’s what people from a DAX-concern report.’

- (837) Der Staatsanwalt ordnet eine Obduktion an, wenn es the public.prosecutor mandates a autopsy on whenever it sein könnte oder fest steht, dass ein Mensch eines be-INF could or firm stands that a man a unnatürlichen Todes gestorben ist.¹⁸¹ unnatural death die-PPP is

178 P96/SEP.35113 Die Presse, 20/09/1996.

179 DeReKo: RHZ09/APR.00262 Rhein-Zeitung, 01/04/2009.

180 DeReKo: NUN05/JUN.01555 Nürnberger Nachrichten, 14/06/2005.

‘The public prosecutor mandates an autopsy whenever it is possible or certain that a man has died from a non-natural death.’

Nevertheless, instances such as those given above are very hard to find and only *könnte* could be found in these environments. This reflects more or less the situation for conditionals, as is illustrated in Section 4.17. In contrast to the other temporal clauses, the temporal conjunction *wenn* affects the Time of Evaluation of the subordinate clause rather than its Topic Time, as the correct paraphrase for example (836) is: ‘Whenever the deictic centre assumes that something is going on they call us.’ Moreover, the deictic centre in examples (836)–(837) is not anchored to the speaker, but obviously to the matrix subject referent. In this respect, these examples are reminiscent of conditional *wenn*-clauses, as was demonstrated in Section 4.17. This specific behaviour of epistemic modal verbs in temporal *wenn*-clauses could be due to the generic interpretation *wenn* displays in both examples above. Crucially, the two *wenn*-clauses in the examples above cannot obtain the interpretation that refers to a single event.

In nearly all of the cases discussed above, the epistemic modal operator is clearly anchored to the speaker. The only exceptions are epistemic modal verbs that occur in generic temporal *wenn*-clauses. However, in either case, the epistemic modal verbs embedded in temporal clauses involve a clearly defined deictic centre and, as a consequence, they are rather interpreted in a ‘subjective’ way than in an ‘objective’ one.

The very restricted compatibility of epistemic modal verbs with temporal clauses turns out to be a very expressive characteristic for the nature of these verbs. This is not surprising, since they are excluded from event-related conditional clauses which are semantically related. Interestingly, this has been ignored in the discussion about epistemic modal verbs since it was briefly mentioned by Aijmer (1978: 164). In contrast, this criterion has been invoked for the characterisation of modal particles. As Coniglio (2008: 194) argues, modal particles are items that are interpreted with respect to the speaker and therefore require a clause that has independent illocutionary force. Following Haegeman (2002: 137), he assumes that temporal clauses lack an independent illocutionary force and, as a consequence, they are not suitable hosts for speaker oriented operators.

Moreover, the poor acceptability of epistemic modal verbs in temporal clauses could also be related to a condition that plays a role in their incompatibility with event-related conditional clauses. As Kratzer (1995: 130) points out, *when*-clauses in English are no suitable hosts for stative verbs. This behaviour seems to extend to most temporal clauses as well. This could explain why epistemic modal verbs are

181 DeReKo: NUN05/JAN.01398 Nürnberger Nachrichten, 15/01/2005.

not readily compatible with these contexts: encoding mental states, they exhibit an affinity to stative predicates.

It merits closer attention, that, among all of the epistemic modal verbs in German, there are two which are significantly more frequently attested in temporal clauses than the rest: *dürfte*, and to some lesser extent, *könnte*. This could be an important clue in identifying the particular meaning of these two items.

4.19 Excluded from restrictive relative clauses

Aijmer (1978: 164) claims that epistemic modal auxiliaries in English do not occur in restrictive relative clauses, but only in non-restrictive relative clauses. Again, she does not provide a single example illustrating her hypothesis, nor does she give a reason why epistemic modal operators should behave in this particular way. Likewise, Krämer (2005: 24) argues that epistemic *werden* is excluded from restrictive relative clauses. Contrary to their claims, epistemic modals are broadly attested in restrictive relative clauses in German. In the DeReKo corpus various lexical items can be found in these contexts, such as *muss* (cf. 838–839), *dürfte* in (cf. 840–841), *mag* (cf. 842) and *wird* (cf. 843).

- (838) Die Woltwiescher Kirche ist mehr als 850 Jahre alt, der Name, the Woltwieschian church is more than 850 years old the name den das Gotteshaus gehabt haben muss, ist nicht REL.PRN.ACC the god.home have-PPP have-INF must is NEG mehr in Erinnerung.¹⁸²
more in memory

‘The Woltwieschian Church is more than 850 years old, the name that must have been attributed to it has been forgotten.’

- (839) Aufgrund der am Unfallort gefundenen Spuren dürfte es because the at.the accident.place found traces might it sich beim Fahrzeug um einen weissen Citroën BX handeln, REFL by.the vehicle about a white Citroën BX deal-INF der vorne links sowie hinten beschädigt REL.PRN.NOM in.the.front left as.well.as in.the.back damage-PPP sein muss.¹⁸³
be-INF must.

‘According to the traces left at the place of the accident, the car may have been a white Citroën BX which should be damaged in the front on the left side and in the back.’

¹⁸² BRZ08/MAI.07291 Braunschweiger Zeitung, 15/05/2008.

¹⁸³ DeReKo: A98/JAN.04926 St. Galler Tagblatt, 26/01/1998.

- (840) Das Öl verloren hat vermutlich ein Pkw, dem beim
 the oil lost has presumably a car REL.PRN.DAT by.the
 Abbiegen von der Kesselstraße in die Dammstraße ein
 turn-INF.NOUN from the Kesselstraße in the Dammstraße a
 Öldruckschlauch geplatzt sein dürfte.¹⁸⁴
 oil.pressure.pipe burst-PPP be-INF might
 ‘The oil was lost by a car in which an oil pressure pipe might have burst while turning
 from Kesselstraße into Dammstraße.’
- (841) Die Erben haben Gründe, die der Verstorbene in seiner
 the heirs have reasons REL.PRN.ACC the deceased in his
 Unergründlichkeit geahnt haben dürfte.¹⁸⁵
 inscrutability guess-PPP have-INF might
 ‘The heirs have motives that the deceased might have guessed in his inscrutability.’
- (842) Jedem, der bislang vielleicht noch Verständnis für die
 everyone REL.PRN.NOM so.far maybe still sympathy for the
 Forderungen der GDL gehabt haben mag, muss spätestens
 demands the-GEN GDL have have may must at.the.latest
 jetzt klar geworden sein, um was es bei diesem Konflikt
 now clear become-PPP be-INF about what it by this conflict
 inzwischen geht.¹⁸⁶
 meanwhile goes
 ‘Anybody who may have still had sympathy for the demands by the GDL should know
 by now what this conflict is really about.’
- (843) Der Chef der Drogeriemarktkette dm war zu Gast in Wissen –
 the boss the-GEN drugstore.chain dm was at host in Wissen
 und präsentierte eine Idee, die auf viele Zuhörer
 and presented a idea REL.PRN.NOM on much listeners
 ziemlich revolutionär gewirkt haben wird.¹⁸⁷
 very revolutionary affect-PPP have-INF will
 ‘The boss of the drugstore chain “dm” was invited o to the radio transmission “Wissen”
 and he presented an idea that might have sounded like a revolution for most of the
 audience.’

Even if Aijmer (1978: 164) has not empirically supported her claim, it seems plausible in the light of a couple of more recent studies. Haegeman (2002: 166) and

184 DeReKo: V99/OKT.47532 Vorarlberger Nachrichten, 05/10/1999.

185 DeReKo: R97/JUL.50523 Frankfurter Rundschau, 02/07/1997.

186 DeReKo: HAZ07/NOV.05100 Hannoversche Allgemeine, 19/11/2007.

187 DeReKo: RHZ09/JUL. 20092 Rhein-Zeitung, 23/07/2009.

Coniglio (2008: 206, 214) argue that only non-restrictive relative clauses have independent illocutionary force, which renders them suitable hosts for expressions that are evaluated with respect to the speaker, whereas restrictive relative clauses lacking independent illocutionary force cannot contain speaker-related items, such as modal particles. Nevertheless, there is overwhelming empirical evidence that these claims are not true, and there are numerous occurrences of epistemic modal verbs embedded in restrictive relative clauses. In all of the cases above, there is a clearly defined deictic centre which is anchored to the speaker referent.

As Asbach-Schnitker (1977: 46) has pointed out, the situation is parallel to the speaker oriented discourse particle *wohl*. Most importantly, this concerns restrictive relative clauses that modify a NP index that lacks an established reference, as is illustrated in example (844). A similar example taken from the DeReKo corpus is provided by Zimmermann (2004: 280) shown in (845):

- (844) Den Schlüssel, den du dort wohl finden wirst, wird
 the key REL.PRN.ACC you there maybe find-INF will will
 dir Einlaß gewähren.
 you entrance ensure-INF
 ‘The key that you will maybe find there will ensure your entrance.’

- (845) Anzunehmen ist, daß eine Frau, die wohl kaum
 to.assume-INF is that a woman REL.PRN.ACC maybe hardly
 Beratung, sondern Hilfe bei der Polizei sucht, sich akut
 advice but help at the police searches REFL urgently
 bedroht fühlt.¹⁸⁸
 threatened feels
 ‘One would assume that a woman that would obviously hardly look for advice at the police office but rather help feels threatened.’

In analogy to restrictive clauses that contain epistemic modal verbs, the deictic centre is anchored to the speaker.

4.20 Excluded from the scope of a quantifier

Inspired by Leech (1971: 73), Drubig (2001: 15) concludes, based on data from English, that quantifiers are unable to take scope over (‘subjective’) epistemic modal operators. Likewise, Fintel and Iatridou (2003: 174) argue for the existence of the *Epistemic Containment Principle* that prohibits quantifiers to take scope over an epistemic modal operator:

¹⁸⁸ DeReKo: K98/MAI.51110, Kleine Zeitung, 31/05/1998.

(846) Epistemic Containment Principle

A quantifier cannot have scope over an epistemic modal.

Fintel and Iatridou (2003: 174) support their claim with the examples given in (847)–(849). According to their judgements, these examples only allow the *de dicto* reading, in which the quantifier is interpreted in the scope of the epistemic modal operator. The *de re* reading, in which the quantifier takes scope over the epistemic modal operator, is blocked and cannot be forced by an appropriate context.

- (847) * Every student may have left but not every one of them has.¹⁸⁹
 every student x (may x have left) de re, consistent, *ECP
 may (every student have left) de dicto, inconsistent, ^{OK}ECP
- (848) # Every student may be the tallest person in the department.¹⁹⁰
 every student x (may x be the tallest) de re, sensible, *ECP
 may (every student be the tallest) de dicto, nonsense, ^{OK}ECP
- (849) Half of you are healthy. # But everyone may be infected.¹⁹¹
 every person x (may x be infected) de re, consistent, *ECP
 may (every person be infected) de dicto, inconsistent, ^{OK}ECP

As for example (847), Fintel and Iatridou (2003: 175) discuss a context in which quantification over an epistemic modal operator would provide the appropriate interpretation. Suppose the speaker is standing in front of an undergraduate residence seeing that some of the lights are on. Thus, he knows that not all of the students are out. But as he does not know which student lives in which room, he does not really know the precise identity of the students that are in their rooms. Accordingly, for every particular student it is compatible with the speaker's evidence that he or she has left. But as Fintel and Iatridou (2003: 175) argue, even in such contexts, the utterance in example (847) is not acceptable, for the very reason that quantifiers cannot take scope over epistemic modal operators.

Regarding the analysis developed by Fintel and Iatridou (2003), there are two aspects which merit closer attention: first, they only take into consideration one specific epistemic modal auxiliary *may*. There is no discussion of the remaining epistemic modal auxiliaries. It should be checked to what extent items such as *could* or *might* differ with respect to their interaction with quantifiers. Secondly, they almost exclusively focus on strong quantifiers, in particular *every*. As Fintel

189 The acceptability judgements reflect those found in Fintel and Iatridou (2003: 176).

190 The acceptability judgements reflect those found in Fintel and Iatridou (2003: 176).

191 The acceptability judgements reflect those found in Fintel and Iatridou (2003: 176).

and Iatridou (2003: 177) assume, the *Epistemic Containment Principle* could also be extended to weak quantifiers such as *two*, but they only provide scarce evidence for this assumption. Moreover, Fintel and Iatridou (2003: 196) adopt an approach in the style of Heim (1982), in which indefinites are not considered quantifiers but treated as variables that are bound by a generic operator. Accordingly, the ECP turns out to be more vulnerable than it appears at first glance.

Finally, Fintel and Iatridou (2003: 176 Fn.7) themselves acknowledge in a footnote that *de re* interpretations of the example given above seem to be acceptable for some native speakers of English. Tancredi (2007) demonstrates that strong quantifiers can indeed take scope over the epistemic modal verb *may* whereas they cannot take scope over epistemic adverbials such as *perhaps*.

- (850) a. (Objectively speaking), Every student may be Jones.
 b. # (As far as I know), Every student is perhaps Jones.
- (851) a. (Objectively speaking), Most students may be Jones.
 b. # (As far as I know), Most students are perhaps Jones.

According to the view held by Tancredi (2007), there are two types of epistemic modal verbs: metaphysical and doxastic ones. They roughly correspond to the distinction between ‘objective’ and ‘subjective’ epistemic modality introduced by Lyons (1977). As Tancredi (2007) argues, *de re* interpretations such as the ones discussed above are only possible with metaphysical modal verbs, but never with doxastic ones. Rephrased in Lyon’s terms, quantifiers can only take scope over ‘objective’ epistemic modal verbs but not over ‘subjective’ epistemic modal verbs. Based on this distinction, Tancredi (2007) suggests an analysis that accounts for the contrasts between epistemic modal auxiliaries and epistemic adverbials in examples (850) and (851) in terms of different categories: He assumes that an ‘objective’ epistemic interpretation is only available for modal auxiliaries but never for adverbials. Finally, he concludes that epistemic modal auxiliaries in the scope of a quantifier must always be construed with an ‘objective’ epistemic interpretation.

Inspired by the approach suggested by Tancredi (2007), Huitink (2008) reaches a similar conclusion based on data from Dutch. As she argues, epistemic uses of *kunnen* can occur in the scope of expression such as *iedere* ‘every’ and *minsten drie* ‘at least three’.

- (852) Iedere student kan vertrokken zijn.¹⁹²
 every student may leave-PPP be-INF
 ‘Every student may have left, but not every student has left.’

¹⁹² As cited in Huitink (2008: Sect. 1.2). The translation reflects those given by Huitink.

- (853) *Minsten drie mannen kunnen de vader van mijn kind zijn.*¹⁹³
 at.least three men may the father of my child be-INF
 ‘At least three men might be the father of my child.’

Much in Tancredi’s spirit, Huitink argues that quantifiers can only take scope over ‘objective’ epistemic modal verbs but never over ‘subjective’ ones. Thus, Huitink (2008) concludes that any epistemic modal verb that occurs in the scope of a quantifier has to be ‘objective’ epistemic. In accordance with Nuyts (2001a) and Nuyts (2001b), she assumes that the essential difference between an ‘objective’ and ‘subjective’ epistemic modality concerns the accessibility of the evidence upon which the epistemic judgement is grounded: Whereas in the case of ‘objective’ epistemic modal verbs, the evidence is always accessible to a larger group of people, it is accessible to the speaker only in the case of ‘subjective’ epistemic modal verbs, and inscrutable by other participants. As Huitink (2008) concludes, being based on public evidence, it makes it easier for ‘objective’ epistemic modal verbs to take narrow scope with respect to a quantifier. So it is expected that the evidence is accessible to a larger number of people whenever an epistemic modal verb occurs in the scope of a quantifier.

Summing up, there are cases in which expressions such as English *every*, and Dutch *iedere* and *minsten drie Mannen*, take scope over some sort of epistemic modal verb. These examples are not accounted for by Fintel and Iatridou (2003).

There are several ways to explain these configurations. Firstly, one could follow Tancredi (2007) and Huitink (2008) in assuming that any epistemic modal verb which occurs in such a environments has to be interpreted in an ‘objective’ epistemic manner. Secondly, one could assume that these configurations become possible due to the interplay of some idiosyncratic properties of the respective epistemic modal verb and the quantifier under consideration. Thirdly, one could assume that the subject NPs considered here are not genuine quantifiers but some other type of NP, for instance, free choice items.

In the remainder of this section, it will be shown that an approach that considers epistemic modal verbs in the scope of NPs like *iedere* and *minsten drie Mannen* as instances of ‘objective’ epistemic modifiers faces insurmountable challenges. Moreover, it will turn out that the alternative explanations seem to cope with these configurations in a more successful way. The analyses put forth by Tancredi (2007) and Huitink (2008) are problematic for at least four reasons that will be discussed in more detail below: (i) only particular epistemic possibility modal verbs can occur in the scope of a quantifier, (ii) the underlying concept of ‘public evidence’ is fallacious, (iii) ‘subjective’ epistemic modal verbs can occur in the

193 As cited in Huitink (2008: Sect. 1.2). The translation reflects those given by Huitink.

scope of another logical operator (negation), and (iv) quantifiers can take scope over other intensional verbs such as *seem* as well.

Firstly, Tancredi (2007) and Huitink (2008) only take into account a small range of modal verbs and suggest that the discussed phenomena can be extended to the remaining modal verbs as well. Tancredi (2007) only discusses cases with *may* for English; Huitink (2008) almost exclusively focuses on instances of *kunnen* in Dutch. However, it remains to be demonstrated that this phenomenon affects the other verbs which are traditionally considered as ‘objective’ epistemic modal verbs as well. In a similar fashion, both of them dedicate most of their attention to the expressions *every* and *iedere*.

In order to find out to what extent this phenomenon applies to all modal verbs that are usually regarded as ‘objective’, the following section provides extensive corpus data from German. All potential candidates among the group of modal verbs will be considered. Being closely related to Dutch, German is expected to behave in a similar way. As it turns out, configurations in which the quantifier *jeder* ‘every’ takes scope over an epistemic modal verb are attested with indicative *können* (cf. 854–855) and with its past subjunctive *könnte* (cf. 856–858).

- (854) Da die Schule den ganzen Tag und teilweise auch am späteren
as the school the whole day and partially also at later
Abend zugänglich ist, kann jeder die Kopien mitgenommen
evening accessible is can everybody the copies with.take-PPP
haben.¹⁹⁴
have-INF
‘As the school is open during the whole day and sometimes until late in the evening,
anyone could have taken the copies.’
- (855) Auch wenn ein Landstreicher schnell von den Dorfbewohnern
even if a vagabond fast by the villagers
verdächtigt wird, kann es jeder gewesen sein.¹⁹⁵
suspect-PPP PASS.AUX can it everybody be-PPP be-INF
‘Even if a vagabond is quickly suspected by the villagers, it could have been anyone.’
- (856) „Diesen Brief könnte jeder geschrieben haben, es geht in
this letter could everybody write-PPP have-INF it goes in
keine politische Richtung“, so Werner Hosiner-Gradwohl.¹⁹⁶
no political direction so Werner Hosiner-Gradwohl

194 DeReKo: A98/JUN.37190 St. Galler Tagblatt, 05/06/1998.

195 DeReKo: RHZ09/NOV.16738 Rhein-Zeitung, 19/11/2009.

‘“Anyone could have written this letter, it does not indicate any political direction.”, according to Werner Hosiner-Gradwohl.’

- (857) Und sie nennt andere Wege, wie die Kippe an den Tatort
and she states other ways how the butt at the site.of.crime
gelangt sein könnte. [...] Jeder Passant könnte sie an seinen
get-PPP be-INF could every pedestrian could she at his
Schuhen in der Keller getragen haben.¹⁹⁷
shoes in the cellar carry-POP have-INF

‘And she specifies other ways how the cigarette butt could have come to the site of crime. Any pedestrian could have had it on his shoes and carried it into the cellar.’

- (858) Im Prinzip könnte es freilich jeder gewesen sein,
in principle could it certainly everybody be-PPP be-INF
der vorbeigefahren ist.¹⁹⁸
REL.PRN pass-PPP is

‘Certainly, in principle, it could have been anybody who passed.’

Crucially, all of these cases involve ‘subjective’ epistemic reasoning. In each example, some unknown person has committed a crime and the speaker does not know who exactly committed it. By employing a quantifying subject NP, the speaker establishes a restriction on the set of potential suspects. For example (856) the appropriate paraphrase would be: *For every single person, it is consistent with my knowledge that he or she wrote the threatening letter.* It is not evident to what extent the quantifier establishes a set of potential suspects that is exhaustive. In example (858), the speaker suspects the culprit to be among the people who have passed. But this does not necessarily mean that the speaker explicitly excludes that the culprit is not amongst this set.

Note that these observations also hold for the examples with weak quantifiers such as *mindestens drei* ‘at least three’. The German examples can be transferred word by word from the Dutch examples provided by Huitink (2008). As it seems, there are two ways to adapt these examples to German, either with the indicative form *können* (cf. 859), or with subjunctive of the past form *könnte* (cf. 860).

- (859) Mindestens drei Männer können der Vater meines Kindes
at.least three men can the father my-GEN child-GEN
sein.
be-INF

‘At least three men could be the father of my child.’

196 DeReKo: BVZ07/SEP.03009 Burgenländische Volkszeitung, 26/09/2007.

197 DeReKo: HAZ08/DEZ.01566 Hannoversche Allgemeine, 09/12/1008.

198 DeReKo: BVZ07/AUG.01787 Burgenländische Volkszeitung, 22/08/2007.

- (860) Mindestens drei Männer könnten der Vater meines Kindes
 at.least three men could the father my-GEN child-GEN
 sein.
 be-INF
 ‘At least three men could be the father of my child.’

As it turns out, they fulfil the most important criterion for ‘subjective’ epistemic modifiers, according to which the embedded prediction is not part of the speaker’s knowledge.¹⁹⁹ Once again, the expression *mindestens drei* establishes a set of potential suspects.

There are two more epistemic modal verbs in German that resemble *können* and *könnte* in semantic respects: Bech (1949: 20, 22, 38) provides a semantic definition for *dürfte* and *mögen* that amounts to an analysis of these verbs as possibility modal operators, even though he does not use this term. Instead, he calls them “passive” modal verbs. But his definition corresponds to the definition of possibility in modal logic. Likewise, Welke (1965: 110) argues that epistemic *mögen* resembles epistemic *können* in that they can mutually be replaced and in that the both can be substituted by epistemic adverbs such as *möglicherweise*. In a similar fashion, Lötscher (1991: 353) states that *dürfte* can be replaced with *könnte* without any significant semantic effect.

However, *dürfte* and *mögen* are not attested in the scope of *jeder* and similar expressions. Furthermore, it turns out that neither of the verbs can replace *können* or *könnte* in the examples above. Whenever epistemic *dürfte* or *mögen* are inserted in these patterns, the quantifier always takes narrow scope with respect to the epistemic modal verb resulting in interpretations that reflect absurd situations.

199 These examples are indeed somewhat tricky. According to the CoDeC the embedded proposition should not be part of the speaker’s knowledge. In the examples above, the embedded proposition is not ‘Three men are the father of my child’; rather, it contains an unbound variable ‘ x_i is the father of my child’. Of course the speaker will know that there is some x which is the father of her child. Accordingly, the proposition ‘ x is the father of my child’ will also be part of her knowledge. But this is also the case in assertions in which the subject is focused. From (i) follows (ii):

- (1) PEter may be the father of my child.
- (2) x_i is the father of my child.

In the canonical case, the ‘unknown’ constituent is the predicate or the object. A similar observation has been made by McDowell (1987: 236).

As it seems then, the CoDeC has to be refined. Maybe, the crucial difference is that in the one case the variable is bound by a quantifier and in the other case it is a free variable.

- (861) # Mindestens drei Männer dürften der Vater meines Kindes
 at.least three men may the father my-GEN child-GEN
 sein.
 be-INF
 Intended reading: ‘Perhaps, at least three men are the father of my child.’
- (862) #? Mindestens drei Männer mögen der Vater meines Kindes
 at.least three men may the father my-GEN child-GEN
 sein.
 be-INF
 Intended reading: ‘Perhaps, at least three men are the father of my child.’
- (863) # Da die Schule den ganzen Tag und teilweise auch am späteren
 as the school the whole day and partially also at later
 Abend zugänglich ist, dürfte jeder die Kopien
 evening accessible is might everybody the copies
 mitgenommen haben.
 with.take-PPP have-INF
 Intended reading: ‘As the school is open during the whole day and sometimes until
 late in the evening, everyone has perhaps taken the copies.’
- (864) #? Da die Schule den ganzen Tag und teilweise auch am späteren
 as the school the whole day and partially also at later
 Abend zugänglich ist, mag jeder die Kopien mitgenommen
 evening accessible is may everybody the copies with.take-PPP
 haben.
 have-INF
 Intended reading: ‘As the school is open during the whole day and sometimes until
 late in the evening, everyone has perhaps taken the copies.’
- (865) # „Diesen Brief dürfte jeder geschrieben haben, es geht in
 this letter might everybody write-PPP have-INF it goes in
 keine politische Richtung”, so Werner Hosiner-Gradwohl.
 no political direction so Werner Hosiner-Gradwohl
 ‘Intended reading: “Everyone could have written this letter, it does not indicate any
 political direction”, according to Werner Hosiner-Gradwohl.’
- (866) #? „Diesen Brief mag jeder geschrieben haben, es geht in
 this letter may everybody write-PPP have-INF it goes in
 keine politische Richtung”, so Werner Hosiner-Gradwohl.
 no political direction so Werner Hosiner-Gradwohl
 ‘Intended reading: “Everyone could have written this letter, it does not indicate any
 political direction”, according to Werner Hosiner-Gradwohl.’

Accordingly, the only interpretation that is available for example (861) would refer to an act of procreation that lies beyond any imagination. A similar reasoning ap-

plies to the other examples with epistemic *dürfte*, (863) and (865). By contrast, the examples with epistemic *mögen* are far less clear. This might be related to the fact that its pure possibility reading has vanished from present-day spoken Standard German, so the typical native speaker of Standard German will not have any active knowledge any more to employ *mögen* in this particular use. Rather, epistemic *mögen* has acquired a concessive component. However, it is beyond doubt that *mögen* cannot be interpreted in the scope of quantifying subject NPs, such as *jeder* or *mindestens drei*. Thus, a *de dicto* reading is not available in examples (862), (864) and (866).

Likewise, it is not possible to provide compelling evidence that the remaining two epistemic modal verbs *müssen* and *werden* occur in the scope of a quantifier. Obviously, this is due to the fact that both of them are necessity modals.²⁰⁰ As pointed out by Fintel and Iatridou (2003: 175, 177), scope ambiguities cannot be detected as long as the epistemic modal and the subject NP involve universal quantification. Thus, *de dicto* interpretations and *de re* interpretations become indistinguishable in such situations.

Accordingly, it has been proposed that the interaction of epistemic modal verbs with quantifying phrases is subject to a modal force asymmetry, cf. Hacquard and Wellwood (2012: 22). Epistemic possibility verbs appear to be possible in the scope of such quantifying expressions, whereas epistemic modal verbs with a stronger modal force, such as *dürfte*, fail to be. This contrast can be observed even if the quantifying expression occurs in object (cf. 867) or adjunct position (cf. 868), granted that the quantifying expression bears focus.

(867) a. Die Jury könnte JEden dieser Filme mit dem
 the jury could each-ACC these-GEN movies-GEN with the
 Hauptpreis ausgezeichnet haben.
 main.award award-PPP have-INF
 ‘The jury could have awarded any of these movies with the main award.’

b. # Die Jury dürfte JEden dieser Filme mit dem
 the jury could each-ACC these-GEN movies-GEN with the
 Hauptpreis ausgezeichnet haben.
 main.award award-PPP have-INF
 Intended reading: ‘It is likely that the jury has awarded every of these movies with the main award.’

(868) a. Joseph könnte den Schlüssel in JEdem dieser
 Joseph could the key in each these-GEN
 Kästen versteckt haben.
 cupboard-GEN hide-PPP have-INF
 ‘Joseph may have hidden the key in any of these cupboards.’

- b. # Joseph dürfte den Schlüssel in Jedem dieser Kästen
 Joseph might the key in each these-GEN cupboard-GEN
 versteckt haben.
 hide-PPP have-INF

Intended reading: 'It is likely that Joseph hid the key in every of these cupboards.'

This indicates that, obviously, it is a property of possibility modal verbs to be able to occur in the scope of quantifying expressions.

Summing up this counter-argument, it has been demonstrated that there are only two particular epistemic items that are attested in the scope of an expression like *jeder* or *mindestens drei*, the possibility verbs *können* and *könnte*. The situation for (British) English seems to be similar. As Philippa Cook has pointed out (pers. commun.), the most appropriate translation for the example discussed by Huitink (2008) would involve *could*, (cf. 869). The other possibility modal verbs *may* and *might* appear to be awkward in this environment.

(869) At least three men could be the father of my child.²⁰¹

What conclusions does this invite? Defending the claim that quantifiers can only take scope over 'objective' modal verbs, but never over 'subjective' ones, one could argue that these two items are the only true 'objective' epistemic verbs in German. Indeed, Öhlschläger (1989: 207) assumes that *mögen* does not involve an 'objective' epistemic interpretation, so examples like (862), (864) and (866) are expected to lack a *de dicto*-interpretation. However, as Öhlschläger (1989: 192) argues, the class of 'objective' epistemic modal verbs in German does not only comprise *können*, but also *müssen* and *dürfte*. As has been shown above, these two verbs cannot occur in the scope of *jeder* and *mindestens drei* in German. One could reason that Öhlschläger (1989) is wrong, and that German only has two truly 'objective' epistemic modal verbs, *können* and *könnte*. Alternatively, one could assume that the class of 'objective' epistemic modal verbs in German also encompasses *müssen* and *dürfte*, and that these items cannot occur in the scope of a quantifier due to further, idiosyncratic restrictions. As the first solution seems to be somewhat counter-intuitive, there is no way of avoiding the assumption that the contrast discussed here is mainly driven by idiosyncratic properties of the verb. Thus, it is not necessary to assume a separate category like 'objective' epistemic modality in order to account for epistemic modal verbs that occur in the scope of an expression like *jeder* or *mindestens drei*.

²⁰⁰ Brennan (1993: 97) and Enç (1996: 356) analyse the English future auxiliary *will* as necessity modal. As it seems this analysis can be extended to German *werden* as well. A detailed discussion is given in Section 2.2.10.

²⁰¹ This example has been provided by Philippa Cook.

Apart from this, Huitink's approach faces a second problem. Her analysis is based on the assumption proposed by Nuyts (2001a) and Nuyts (2001b) that the accessibility of the evidence is the crucial factor in the distinction between 'objective' and 'subjective' epistemic modality. Whereas the evidence upon which the epistemic evaluation is based is accessible to a larger group of people, in the case of 'objective' epistemic modal verbs, it is accessible to the speaker only and inscrutable from the outside in the case of 'subjective' epistemic examples. However, this analysis makes the wrong prediction for her example (853), which is repeated here as (870). According to Huitink (2008), the quantifying NP *minsten drie* can take scope over epistemic *kunnen* because it is an 'objective' epistemic modal verb.

- (870) *Minsten drie mannen kunnen de vader van mijn kind zijn.*²⁰²
 at.least three men may the father of my child be-INF
 'At least three men might be the father of my child.'

Accordingly, this instance of *kunnen* should involve an epistemic evaluation that is based on 'public evidence': everyone should come to the same conclusion that at least three men could be the father of the child. But utterances like (870) are most usually uttered in contexts in which the speaker alone knows the exact number of men with whom she was romantically involved. Furthermore, this sentence is perfectly felicitous if the speaker herself only has the appropriate evidence to reach this conclusion. An approach such as the one advocated by Huitink (2008) would lead us to at least expect example (870) to exhibit different degrees of acceptability, depending on the extent to which the evidence is accessible. However, as it seems, the utterance is equally acceptable irrespective of whether the evidence is accessible to the speaker only or to a larger group. Correspondingly, the accessibility of the evidence on which the epistemic judgement is based is completely irrelevant for the acceptability of example (870).

Yet, there is another problem for an approach in the style of Tancredi (2007) and Huitink (2008). As was demonstrated in Section 4.10, there are a couple of 'subjective' epistemic modal verbs that are attested in the scope of negation, which is also a logical operator. Once again, it is in particular epistemic *können* that occurs in the scope of negation. This reflects, by and large, the scope interaction with quantifiers. Thus, it does not seem to be very odd for epistemic operators to occur in the scope of logical operators.

Finally, the approaches taken by Tancredi (2007) and Huitink (2008) face another challenge. As has been observed on various occasions, intensional/evidential raising verbs such as *appear* or *seem* can occur in the scope of all sorts of

202 As cited in Huitink (2008).

quantifiers: example (871) is taken from Moulton (2010), who has been inspired by Williams (1983: 293), example (872) is taken from Richter and Sailer (2008), and examples (873)–(874) are taken from Lechner (2006: 49):

- (871) A student seems to be sick today.
- (872) A student seems to have passed the test.
- (873) a. Every critic seemed to like the movie. de re/*de dicto
 b. It seemed that every critic liked the movie. de dicto
- (874) a. A critic seemed to like the movie. de re/de dicto
 b. It seemed that a critic liked the movie. de dicto

As Lechner (2006: 49) stresses, strong quantifiers with intensional raising verbs are restricted to a *de dicto* interpretation. This is somewhat unexpected under the view held by Tancredi (2007). As has been demonstrated by Bartsch (1972: 28), Clément and Thümmel (1975: 51, 56, 61, 65, 68, 73), Cinque (1999: 130) and Mortelmans, Boye and Auwera (2009: 43), evidential operators can take scope over epistemic modal operators, but not the other way round. As a quantifier typically takes scope over an evidential operator and as an evidential operator typically takes scope over an epistemic modal operator, it should follow that, in principle, it should also be possible for a quantifier to take scope over an epistemic operator. This is in conflict with Tancredi's assumption. Finally, it remains a great mystery for any account based on the *Epistemic Containment Principle* why universal quantifiers can bear scope over intensional raising verbs such as *seem* in the first place, and why even this scope interpretation is the preferred one.

Summing up, it has been shown that the assumption of a separate category 'objective' epistemic modality is not necessary to account for the acceptability of epistemic modal verbs which occur in the scope of quantifying expressions such as *jeder* or *mindestens drei*. Rather, this type of approach makes a couple of false predictions. Furthermore, what Tancredi (2007) has demonstrated is not so much that quantifiers cannot take scope over 'subjective' epistemic modal verbs, but rather that quantifiers fail to take scope over epistemic adverbs, such as *perhaps*. As will be shown, it is not necessary to assume a separate category 'objective' epistemic modality to account for this contrast.

Refuting the analyses developed by Tancredi (2007) and Huitink (2008) makes it necessary to provide an alternative approach. Any successful account has to provide answers to three essential questions: (i) Why are there restrictions on quantifiers over epistemic modal verbs in the first place? (ii) Which epistemic modal verbs are banned from this restriction? (iii) How can the contrast between epistemic modal verbs and epistemic adverbs be accounted for?

In the remainder of this section, two approaches will be outlined that are largely compatible with each other. Firstly, one could assume that the restrictions on quantifiers over epistemic modal verbs are due to an interplay of idiosyncratic properties of the respective epistemic modal verb and the quantifier. As has been illustrated above, all of the examples discussed so far have involved possibility modal verbs, which are existential quantifiers over possible worlds: English *may*, Dutch *kunnen* and German *können* and *könnte*. This could indicate that quantifying NPs only take scope over possibility modal verbs. But then, the question arises why in German *jeder* and *mindestens drei* fail to take scope over epistemic *dürfte* and epistemic *mögen*, which are traditionally considered as possibility verbs as well, as has been suggested by Bech (1949: 20, 22, 38). However, this classification is contested by a whole range of authors. As has been illustrated by Kratzer (1981: 58), epistemic *dürfte* is difficult to translate into English, as there is no direct corresponding verb in English and she provides a rough circumscription: ‘it is probable that’. Later, in Kratzer (1991: 650), she becomes more explicit, considering *dürfte* as a weak necessity modal. In a similar fashion, Öhlschläger (1989: 195, 258) does not regard epistemic *dürfte* as an indicator of possibility but rather as an indicator of probability. An extensive discussion is given in Section 2.2.5. Likewise, *mögen* does not fulfil the requirements of a well behaved possibility modal verb either. As has been shown by Bech (1949: 23), Welke (1965: 110), Allard (1975: 88), Öhlschläger (1989: 187 Fn. 121), Fritz (1991: 48) and Diewald (1999: 236) epistemic *mögen* usually conveys some concessive meaning and thus behaves in a marked way. A detailed discussion of this issue can be found in Section 2.2.7. As it turns out, quantifying expressions such as *jeder* and *mindestens drei* can only take scope over the ‘true’ and ‘pure’ epistemic possibility modal verbs *können* and *könnte* in German. The data from English provided by Tancredi (2007) and the data from Dutch provided by Huitink (2008) additionally support this assumption.

Returning to question (ii), it has been shown that expressions like *jeder* and *mindestens drei*, with scope over an epistemic operator, are only attested in configurations in which the epistemic modal verb is a possibility verb. This could lead us to the conclusion that the modal force is the relevant aspect. In the case of possibility modal operators, existential quantification is involved, which is canonically regarded as weak quantification.

In turn, this insight could finally provide an answer to question (i): As has been pointed out by Lechner (2006: 49), weak quantifiers obey fewer restrictions, and they occur more readily in marked contexts than strong quantifiers do: Whereas, for instance, weak quantifiers in the subject position of a raising verb can reconstruct into a scope position below the raising verb, strong quantifiers fail to reconstruct. As a consequence, it is plausible to assume that the

acceptability of an epistemic operator in the scope of a quantifier is the result of the interplay between the strength of the quantifier and the modal force of the epistemic operator. In a similar manner, Lyons (1977: 801) has already pointed out that epistemic possibility verbs appear to be much more flexible than their counterparts, which encode a necessity.

Turning to the contrasts between epistemic possibility verbs and epistemic possibility adverbs such as *perhaps*, it seems to be necessary that the subject quantifier is in an agreement relation with the epistemic operator. This would explain why a quantifier never takes scope over an epistemic adverbial. This reasoning is supported by the fact that the plural subject *most students* in example (851a), repeated here as (875a), matches a singular NP in predicative Jones mediated by the finite verb.

- (875) a. (Objectively speaking), Most students may be Jones.
 b. # (As far as I know), Most students are perhaps Jones.

However, it is questionable to what extent all of the examples discussed here do indeed involve genuine quantifiers. Attentive readers might have noticed that, in the German examples (854)–(858), *jeder* was systematically translated as *anybody* rather than *everybody*. Accordingly, the suspicion arises that the instances of *jeder* in the examples above turn out to be universal free choice items, rather than universal quantifiers. This suspicion is supported by the fact that, in any context in which in English *any* is chosen, it would be translated as *jeder* in German. Thus, *jeder* is ambiguous between an interpretation as a genuine universal quantifier and an interpretation as a universal free choice item. As a consequence, it is possible to develop an alternative approach in which the quantifying expressions under discussion, such as *jeder*, are treated as free choice items.

Such an approach is further supported by the observation made by Menedéz-Benito (2010: 33), who illustrates that it is the typical property of universal free choice items to take scope over possibility modal verbs. Moreover, she shows that universal free choice items are rather reluctant to bear scope over necessity modals. Note that Menedéz-Benito (2010) focuses exclusively on universal free choice items which bear scope over circumstantial possibility verbs. However, as it seems, this phenomenon seems to be possible with epistemic possibility verbs as well. In her analysis, Menedéz-Benito (2010: 41) regards universal free choice items as indeterminate pronouns that have to agree with a universal quantifier. This universal quantifier is a propositional operator $[\forall](A)$ operating on the set of propositions *A*. This set is constituted by the individual alternatives that indeterminate pronouns usually denote: ‘you can pick any card’ $A = \{ \text{‘you can pick The Queen’}, \text{‘you can pick The Ace’}, \text{‘you can pick The Ace and The Queen’}, \dots \}$. The way in which

epistemic modal verbs and universal free choice items interact appears to be a highly complex phenomenon that cannot be investigated in great details here.

There is another fact that makes this second approach, which is based on universal free choice items, more plausible. As Menedéz-Benito (2010: 62) observes, universal free choice items are not licensed by the epistemic possibility adverbs *perhaps*. Assuming that the examples in which *jeder*, *iedere* and *every* take scope over an epistemic modal verb involve universal free choice items rather than universal quantifiers, one would expect that these expressions should never bear scope over an epistemic adverb. This corresponds to the contrast between epistemic modal verbs and epistemic adverbs observed by Tancredi (2007). As has been suggested above, an alternative explanation to Tancredi's proposal can be achieved based on the assumption that quantifying expressions can only take scope over epistemic operators if they establish an agreement relation with each other. This assumption is supported for West Germanic languages at least.

However, under the view held here, two challenges arise. Firstly, the analysis based on universal free choice items would imply that *every* in Tancredi's examples would have to be analysed as a free choice item, rather than a universal quantifier. This is indeed a rather unusual conclusion. But as the acceptability of these examples are contested by Fintel and Iatridou (2003: 176 Fn.7), it seems to be plausible to assume that the use of *every* as a universal free choice item is restricted to some subset of native speakers of English. According to this view, this subset of speakers would have a lexicon in which *every* has an additional free choice item interpretation next to its canonical quantifier interpretation, much in the way in which the lexicons of native speakers of Dutch or German are structured. Secondly, the analysis sketched here implies that other quantifiers, such as *at least three*, *minsten drie* and *mindestens drei*, should also exhibit an interpretation as a free choice item. This issue yet remains to be thoroughly investigated.

Summing up, it has been shown in this section that the *Epistemic Containment Principle* advocated by Fintel and Iatridou (2003) is contested, as there is a restricted set of epistemic modal verbs that can occur in the scope of expressions like *every*, *jeder*, *minsten drie*. Crucially, these instances cannot be taken as a justification for the existence of 'objective' epistemic modal verbs. Firstly, these configurations are only attested with a small subset of epistemic possibility modal verbs. If it was a characteristic for an 'objective' epistemic modal verb to be able to occur in the scope of *jeder*, it remains unclear why the remaining verbs, which are generally regarded as 'objective' epistemic, fail to occur in these environments. Furthermore, the quantifying subject NPs in the examples given above exhibit striking similarities with universal free choice items. Thus, it is likely that the NPs discussed here are indeed free choice items.

If the analysis based on free choice items is on the right track, the *Epistemic Containment Principle* could possibly be maintained, as the items that take scope over the epistemic modal verbs in the attested examples would no longer be regarded as canonical quantifiers. Yet, it has to be demonstrated that (i) universal quantifiers involve a way of quantification that substantially differs from those quantifiers which are binding universal free choice items, and (ii) the *Epistemic Containment Principle* does not falsely exclude this second type of quantification. Even if such an approach should succeed, it remains mysterious why quantifiers should not be able to take wide scope over epistemic modal verbs, whereas they are able to take scope over intensional/evidential raising verbs such as *seem*. Thus, the *Epistemic Containment Principle* cannot be taken for granted unless it is demonstrated that it can account for these two challenges. Furthermore, it does not serve to justify the existence of an ‘objective’ epistemic modality. The number of epistemic modal verbs that seem to circumvent the *Epistemic Containment Principle* is fairly restricted: As for German, only two items are attested, namely *können* and *könnte*. If it was the property of the class of ‘objective’ epistemic modal verbs to circumvent this principle, it is far from clear why not all of the members belonging to this class are attested in the scope of expressions like *jeder* or *mindestens drei*.

4.21 No assent/dissent

Lyons (1977: 799) argues that only ‘objective’ epistemic modal verbs are statements about facts. Moreover, he concludes that what the speaker claims to be the case can be denied, questioned and accepted as a fact by the addressee. Correspondingly, the addressee could refer to these statements with expressions of agreement or disagreement, such as ‘I agree’ or ‘that’s not true’. Since he considers ‘subjective’ epistemic modal verbs as statements of opinions, he concludes that they cannot be denied, questioned or accepted. In a similar vein, Öhlschläger (1989: 210) suggests that only ‘objective’ epistemic modal verbs can be commented on. Based on his assumption that the only unambiguous ‘subjective’ epistemic modal verb is *mag*, he concludes that the discourse anaphora *das* in example (876b) can only refer to the proposition in the scope of the epistemic modal operator ‘the accused is the culprit’, but not to the attitude encoded by the ‘subjective’ epistemic modal operator *mag*:

- (876) a. A: Der Angeklagte mag der Täter sein.
 the accused may the culprit be-BE

- b. B: Das glaube ich nicht.²⁰³
 that believe I NEG
 ‘A: The accused may be the culprit.’
 ‘B: I don’t think so.’

By contrast, he assumes that the discourse anaphora *das* can refer to *können*, *müssen* and *dürfte* if they are used in an ‘objective’ epistemic manner.

As was shown in various examples in this study, the restricted acceptability of *mag* is in most cases due to its very specific concessive meaning. Moreover, it is not entirely clear whether *das* could really establish a reference to the epistemic modal verb if *mag* (876a) were replaced with *kann*, *muss* or *dürfte*. As it seems, they are not that much more acceptable than *mag* in this configuration. Correspondingly, it is questionable whether Öhlschläger’s judgements reflect the actual language use.

As Papafragou (2006: 1697) has pointed out, the assent/dissent test is not a diagnostic that renders a reliable distinction between an ‘objective’ and a ‘subjective’ epistemic interpretation. First of all, she confirms that discourse anaphora cannot refer to mental acts that are encoded by epistemic modal verbs. But as she further demonstrates, acts of inference are generally difficult to challenge by another referent. In the example given above, addressee B would need secure and complete access to the speaker’s knowledge in order to verify whether the conclusion has been made correctly. Papafragou (2006: 1698) shows that this does not only concern ‘subjective’ epistemic modal operators, but also other predicates and expressions that encode mental acts and inferences, such as *infer*, *conclude* and ‘it follows from what I currently know that’. As she demonstrates, the incompatibility of epistemic modal verbs with the assent/dissent test is due to the external inscrutability of mental acts, which concerns all predicates that refer to a mental act of conclusion.

To some extent, dissent is possible with epistemic modal verbs. In particular, this concerns contexts in which it is the speaker himself who challenges the validity of the conclusion. In the examples discussed by Papafragou (2006: 1698), the subject of the dissent is the modal force:

- (877) Clark Kent may be Superman. No that’s not right: Clark Kent must be Superman.
 (878) Clark Kent must be Superman; no wait, that’s not right. Superman may be Clark Kent.

²⁰³ As cited in Öhlschläger (1989: 210).

Similar examples are discussed by Stephenson (2007: 492). In example (879c), Sue expresses her disagreement with Sam's epistemic reasoning by using a negated epistemic possibility verb:

- (879) a. Maria: Where's Bill?
 b. Sam: I'm not sure. He might be in his office.
 c. Sue: No, he can't be. He never works on Fridays.

As has been already shown in Section 4.9, the modal force of an epistemic modal operator can also be challenged by a dialogue partner.

To sum up, the assent/dissent test is not a diagnostic that is appropriate to distinguish 'subjective' epistemic modal verbs from 'objective' epistemic modal verbs. Assent or dissent with epistemic modal verbs is highly restricted and only possible in particular environments.

4.22 Objective and subjective epistemic modality: A reassessment

As was pointed out in the preceding section, the assumption that epistemic modality has to be divided into a separate 'objective' and a 'subjective' epistemic sub-category causes lots of unwelcome difficulties. At the outset of this section, the motivation that led Lyons (1977: 799) to the postulation of this distinction will be carefully re-visited. As it turns out, Lyon's proposal has not systematically been developed, as it is almost exclusively based on observations of one particular epistemic modal operator, the auxiliary *may*. Moreover, it involves conflicting assumptions: on the one hand, Lyons assumes that 'objective' modal operators are less complex than their 'subjective' counterparts in that they take a narrower scope than the latter. On the other hand, he argues that 'objective' epistemic modal operators are more complex insofar as are derived from their 'subjective' epistemic cognates.

Furthermore, it will be demonstrated that any later approach which adopts the distinction between 'objective' and 'subjective' epistemic modality either departs drastically from Lyon's basic assumptions, or is not even aware of their conflicting character. Finally, it will turn out that any of these approaches characterises 'objective' epistemic modality in terms of properties that do not yield a consistent class. Apart from this, most of these accounts involve additional assumptions that turn out to be problematic.

4.22.1 Lyon's original motivation

Based on work by the philosopher R.M Hare, Lyons (1977: 749, 802) assumes that each utterance consists of three components: A phrastic component, which corresponds to the propositional content of the utterance; a tropic component, which specifies the kind of speech act; and a neustic component, which indicates the speaker's commitment to that speech act. Accordingly, each of these components can be individually negated. The phrastic negation results in a context free assertion of a negative proposition: 'I say that it is the case that not-*p*.' The tropic negation yields a denial: 'I say that it is not the case that *p*.' The neustic negation corresponds to a non-commitment: 'I don't say that it is the case that *p*'. In his formalisation, Lyons (1977: 802) represents the phrastic component by the variable *p*, the tropic and the neustic component each by a full-stop. By means of different combinations of various operators, a whole range of utterance types can be captured, such as assertion (cf. 880), question (cf. 881), command (cf. 882), prohibition (cf. 883) and deliberative question (cf. 884):

- (880) ..*p*
- (881) ?.*p*
- (882) .!*p*
- (883) .~!*p*
- (884) ?!*p*

According to Lyons (1977: 804), the modal operators *poss* and *nec* can occupy either position, tropic or neustic. In case the speaker wants to express that he knows about the possibility that *p*, he chooses an 'objective' epistemic operator yielding: 'I say so that it is possibly the case that *p*.' If he is not so committed to his assertion, he would rather use a 'subjective' epistemic operator: 'Possibly/Perhaps it is the case that *p*'. In order to illustrate the nature of 'objective' epistemic modality, Lyons (1977: 798) provides the following example. Imagine that Alfred is part of a community of 90 people. Assume that the speaker knows that 30 of them are unmarried without being aware of who exactly they are. Employing *may* in this context, the speaker signals his knowledge of the possibility that Alfred is unmarried, as is shown in example (885). Assume that the speaker could already identify 89 people, among them 29 who are unmarried and that only Alfred is left. Given this sort of context, the speaker uses *must* to indicate that he knows about the necessity that Alfred is married, as illustrated in example (886).

- (885) Alfred may be unmarried.

(886) Alfred must be married.

Following this claim, a speaker can choose, depending on his knowledge, between operators that express an ‘objective’ epistemic modality and operators that express a ‘subjective’ epistemic modality. Correspondingly, Lyons (1977: 804) argues that objective epistemicity is a qualifier for the tropic *it is so* component (cf. 887), and that subjective epistemicity is a qualifier for the neustic *I-say-so* component (cf. 888).

(887) .poss p

(888) poss.p

Lyons (1977: 799) assumes that utterances that contain ‘objective’ modal operators do not differ from canonical assertions:

The speaker is committed to their factuality of the information he is giving to the addressee: he is performing an act of telling [...]

Furthermore, Lyons (1977: 799) argues that ‘objective’ modal verbs are stated and, thus, they can be embedded by a whole range of operators, such as question operators:

What he states to be the case can be denied, questioned, accepted as a fact by the addressee, it can hypothesised in a real conditional statement, it can be referred to by the complement of a factive predicator.

In contrast, Lyons (1977: 805) considers ‘subjective’ epistemic modal operators as having proper illocutionary force.

[The function of subjective epistemic modality] is to express different degrees of commitment to factuality; and in this respect it qualifies the illocutionary act in much the same way that a performative verb parenthetically qualifies, or modulates, the utterance of which it is a constituent in an explicitly performative utterance or a primary performative with a performative clause tagged on to it. Looked at from this point of view, ‘It may be raining’ (construed as a subjectively modalised utterance) stands in the same relationship to ‘It’s raining’, ‘I think’ or ‘I think it’s raining’ as ‘Is it raining?’ does to ‘Is it raining, I wonder?’ or ‘I wonder whether it’s raining.’

Lyons (1977: 808) argues that, from this organisation, it follows that there can only be one ‘subjective’ epistemic operator in each utterance.

Apart from that, he provides a couple of further characterisations of these two types of epistemic modality. First of all, Lyons (1977: 797–800) points out that there is no clearcut distinction between ‘objective’ and ‘subjective’ epistemicity:

This is not a distinction that can be drawn sharply in everyday use of language; and its epistemological justification is, to say the least, uncertain. It is also difficult to make a sharp distinction between what we are calling objective modality and alethic modality.

[...]

Granted that the distinction between subjective and objective epistemic modality is theoretically defensible (and we have already pointed out that objective epistemic modality, if it is a viable notion, lies between alethic modality, on the one hand, and subjective modality, on the other, and might be assimilated to either), the question now arises how we should account for these distinctions in terms of the tripartite analysis of utterances developed in the previous chapter.

However, it is not clear how this fuzzy transition between ‘objective’ and ‘subjective’ epistemic modality could be accounted for by the formalisation suggested by Lyons (1977: 804), which is based on two distinct positions for the two different modalities.

Furthermore, Lyons (1977: 801) concludes that some modal operators are more basic than others. In the case of English, he argues that epistemic possibility is more basic than epistemic necessity, and that epistemic possibility should be considered as a primitive of modality. Moreover, Lyons (1977: 805) assumes that ‘subjective’ modality is more basic than ‘objective modality’. As Lyons (1977: 806) argues, ‘objective’ epistemic modality is derived from its ‘subjective’ counterpart by a process of ‘objectification’. As a consequence, he predicts that ‘objective’ epistemic operators should only occur in languages if there is an appropriately established ‘subjective’ cognate from which it could be derived. However, from a diachronic perspective, these claims are not plausible at all. As Fritz (1997: 140) and Diewald (1999: 273, 366) have demonstrated, the historical development is rather the other way around: In a first step, readings of *können* and *müssen* came into existence in which they denote a practical possibility or necessity. These readings were the base for the grammaticalisation of speaker related epistemic possibility and necessity interpretations. Aside from that, there are modal verbs which only involve a practical possibility or necessity, while lacking any epistemic interpretation such as the English possibility modal verb *can*, which was discussed in great detail in Section 3.3.

Apart from that, Lyons (1977) observes tendencies that some syntactic categories appear to have preferences as to which type of modality they can encode. Yet, he is not very explicit in this matter. Lyons (1977: 798) argues that *perhaps* is not appropriate to express ‘objective’ epistemic modality. As Lyons (1977: 806) further concludes, “it is much more natural to use modal verbs for ‘subjective’, than for the expression of ‘objective’ epistemic modality”. In contrast, he states that patterns like ‘it is possible that’, ‘there is a possibility of’ are more appropriate for the expression of ‘objective’ epistemic modality.

The account suggested by Lyons (1977) remains very sketchy in many respects. Therefore, it is not very systematic and faces serious challenges. As he concedes, modal verbs with an ‘objective’ epistemic interpretation are rather exceptional. But is there any reason to believe that they exist at all? Lyons puts forward two crucial pieces of evidence:

Firstly, he provides the two examples (885)–(886) mentioned above, concerning the marital status of Alfred. At first glance, they appear to involve some ‘objective’ epistemic reasoning, as any speaker or reader would reach the same conclusion, given the context above. How does this come about? Note that the set of premises on which the epistemic conclusion is essentially based is fairly manageable. The set of essential premises for the example with *may* consists of the items displayed in example (889), the one for *must* can be seen in example (890).

- (889) a. $p_1 = \{\text{Alfred is part of a group of 90 people.}\}$
 b. $p_2 = \{\text{The group involves 30 people who are unmarried.}\}$
- (890) a. $p_1 = \{\text{Alfred is part of a group of 90 people.}\}$
 b. $p_2 = \{\text{The group involves 30 people who are unmarried.}\}$
 c. $p_3 = \{\text{There is a subgroup of 89 people which does not encompass Alfred.}\}$
 d. $p_4 = \{\text{This subgroup involves 29 unmarried people.}\}$

Unless the knowledge of an epistemic agent involves any conflicting premises, any speaker will reach the same conclusion based on the premises given above. This seems to be a fairly objective way of reasoning.

However, the more canonical case of epistemic modality involves configurations in which different speakers come to different conclusions. This causes the respective sentence to be more subjective. What leads these speakers to judge differently then? In more natural situations, the precise set of premises on which the epistemic conclusion is grounded is much more comprehensive and more obscure, as the examples given below illustrate. Certainly, not every speaker will share the assumptions given below.

- (891) The spring in Kiev must be very cold.
 (892) The rents in Lagos must be cheaper than in Berlin.

Speakers will hardly ever draw on exactly identical sets of premises. If the epistemic reasoning is based on different beliefs, it is not surprising that the outcome is not always identical. Vice versa, this means that two speakers reach exactly the same conclusions if their knowledge involves exactly the same set of propositions. As it turns out, the so called ‘subjective’ epistemic reasoning is as objective as the ‘objective’ epistemic one. The sole difference concerns the set of premises on which the epistemic conclusion is essentially grounded.

The second important piece of evidence on which Lyons' hypothesis is grounded is example (809), which was already discussed extensively in Section 4.17; here it is repeated as (893):

(893) If it may be raining, you should take your umbrella.

As Lyons (1977: 805) concludes, the modal verb *may* in example (893) has to be an 'objective' epistemic one, as it occurs in the antecedent of a conditional clause. In Section 3.4.1 and Section 4.17, it has already been pointed out that there are different types of conditional clauses. Lyons' restriction only makes sense for event-related conditionals, but not for epistemic and speech act related conditionals. In its most natural interpretation, the antecedent in (893) is echoic, in that it involves a proposition that has already been added to the common ground. As pointed out by Fabricius-Hansen and Sæbø (1983: 8), Haegeman (2002: 121, 126) and Eisenberg (2004: 346), this indicates that the conditional is not an event-related one. Haegeman (2002: 119) has illustrated that speech act related conditionals such as the one in (893) have their own illocutionary force. As a consequence, there is nothing that would prevent speaker related operators such as 'subjective' epistemic modal verbs from occurring in such contexts.

As will be shown in Section 4.22.5, the majority of cases that have been considered instances of 'objective' epistemic modal verbs do not involve any epistemicity at all. They can be more efficiently be analysed as practical possibility or necessity modal verbs, or as quantificational modal verbs.

Lyons' characterisation of 'objective' epistemic modality is based on conflicting assumptions. On the one hand, he concludes that it is related to 'alethic' modality, and that they take a narrower scope than their 'subjective' relatives. On the other hand, he states that 'objective' epistemic modal verbs are derived from a 'process of objectification' from their 'subjective' counterparts.

Furthermore, this 'process of objectification' envisaged by Lyons (1977: 806) is in conflict with the development of epistemic modal verbs. Fritz (1997: 140) and Diewald (1999: 273, 366) have shown that the 'subjective' epistemic modal verbs developed out of the 'objective' practical possibility and necessity readings. Unless a plausible and detailed formulation of this 'process of objectification' is put forth, it is misleading to pursue this line of reasoning.

4.22.2 Further advancements in the study of 'objective' epistemic modality

The treatment of epistemicity put forth by Lyons (1977) became fairly influential in the discussion on modality. These ideas have been adopted by many researchers, each of them, departing in a fairly different direction. In particular, there are

three questions with respect to which these accounts differ: (i) What is the precise nature of objective epistemic modality? (ii) Which of the two epistemic modalities is underlying? (iii) Do particular categories involve preferences for any of these two epistemic modalities?

Turning to the first question, Lyons (1977: 797) assumes in his original proposal that 'objective' epistemic modality is closely related to pure mathematical logic, to alethic modality. Likewise, Öhlschläger (1989: 192) explicitly refers to expressions of modal logic in his semantic definitions of the 'objective' epistemic uses of modal verbs. However, this type of approach is hardly compatible with the assumption that 'objective' epistemic modality is derived from its 'subjective' cognate.

By contrast, a whole series of approaches, such as the one put forth by Diewald (1999: 79), is based on the assumption that the crucial aspect of 'objective' epistemic modality is an evidential dimension, rather than alethic or logical reasoning. This was most explicitly stated by Nuyts (2001b: 384, 386), who argues that 'subjective' epistemic modal verbs involve evidence that is accessible to the speaker alone, whereas 'objective' epistemic modality is based on evidence that is accessible to a larger group of referents. Furthermore, Nuyts (2001b: 393) argues that 'objective' epistemic modality should not be related to alethic reasoning. He is completely aware of the fact that his conception of 'objective' epistemic modality differs in essential details from Lyons' original idea, and that it makes different predictions. As a consequence, he suggests replacing the term 'objective' epistemic modality by 'inter-subjective' modality. Furthermore, Nuyts (2001b: 393) concludes that 'subjective' and 'inter-subjective' epistemic modal operators do not essentially differ with respect to the distribution in which they occur, and that differences of their behavioural properties can be derived from functional aspects. Papafragou (2006: 1694), Tancredi (2007: 2) and Huitink (2008: 7) follow the spirit of these assumptions, in assuming that the distinction between 'subjective' and 'objective' epistemic modality is based on whether the underlying evidence is accessible to the speaker alone or public evidence. In a similar fashion, Cohen (2010) assumes that 'objective' and 'subjective' epistemic modal operators are both modifiers of the speech act and only differ with respect to the accessibility of the underlying evidence.

As it turns out, the exact nature of the distinction between 'objective' and 'subjective' epistemic modality is far from obvious. First of all, Lyons (1977) remains rather vague in his original definition. Subsequent adaptations of his proposal lead to fairly different implementations of the concept 'objective' epistemic modality.

The second issue concerns the question of which of the two modalities is more basic. Following the original proposal advocated by Lyons (1977: 806), 'subjective'

epistemic modality is more basic, and its objective counterpart can be derived from it by a process of 'objectification'. In a similar fashion, the approach outlined by Nuyts (2001b: 393) implies that 'inter-subjective' epistemic modal operators are more complex than 'subjective' epistemic ones: Whereas a speaker using the first type indicates that he assumes or concludes that the modified proposition is true, a speaker using the second type additionally expresses that he knows that other referents make the same assumption or conclusion. More specifically, Nuyts (2001b: 392) assumes that 'subjective' epistemic patterns can acquire 'non-subjective' meaning.

In contrast, Hengeveld (1988: 259), Gamon (1993: 152) and Diewald (1999: 273, 366) have demonstrated that the diachronic development suggests that 'subjective' epistemic modal verbs developed out of 'objective' ones. Likewise, Watts (1984: 133) has shown that 'epistemic' *can* in English can never be interpreted in a 'subjective' manner, and is restricted to an 'objective' epistemic interpretation. This indicates that *can* has never developed a 'subjective' epistemic interpretation, though it can nevertheless be interpreted in an 'objective' epistemic manner. Finally, there are accounts, such as the ones defended by Öhlschläger (1989) and Tancredi (2007), which do not explicitly take a stance in this matter. However, both authors stress that 'objective' epistemic modal verbs take a narrower scope position than 'subjective' epistemic modal verbs. This implies that 'objective' epistemic modal verbs would be regarded as more basic, as a narrower scope position is canonically associated with less complexity.

The third question concerns the different ways in which the two types of epistemic modality can be realised. Again, various claims about preferences have been made that are far from homogeneous. As Lyons (1977: 806) argues, it is much more natural to use modal verbs for the expression of 'subjective' than for the expression of 'objective' epistemic modality. In much the same spirit, Watts (1984: 138) concludes that modal verbs are almost always restricted to 'subjective' epistemic readings:

Unless *may* is combined with one of the two modal adverbs *possibly* and *perhaps*, however, it will almost certainly interpreted subjectively.

However, this conflicts with his own observation that *can* only occurs with an 'objective' epistemic interpretation, but never with a 'subjective' one, cf. Watts (1984: 133). In contrast, Nuyts (2001b: 392) concludes that modal verbs are perfectly neutral with respect to the two types of epistemic modality. But as has been indicated above, his assumptions are based on the concept of 'inter-subjective' epistemic modality, rather than 'objective' epistemic modality. Finally, Perkins (1983: 101) argues that *possibly* is always interpreted in an 'objective' epistemic

way, whereas *perhaps* and *maybe* can be either interpreted in an ‘objective’ or ‘subjective’ epistemic way.

As for epistemic adverbials, Lyons (1977: 798) remarks that *perhaps* cannot be interpreted in an ‘objective’ manner in the example he provides. In a similar vein, Watts (1984: 138) argues that the epistemic adverbs *possibly* and *probably* are restricted to a subjective interpretation. Based on data from Hungarian, Kiefer (1984: 69) concludes that epistemic adverbs must always be ‘subjective’. Similar claims have been made for German by Öhlschläger (1989: 212) and Diewald (1999: 84). Finally, Tancredi (2007: Sect. 1 and Sect. 10) assumes that the epistemic adverbs *perhaps* and *probably* in English strongly prefer a subjective use.

In contrast to this, Nuyts (2001a: 389) discusses examples of the epistemic adverbs *waarschijnlijk* and *wahrscheinlich* ‘probably’ in Dutch and German, in which they report results of a long term research. Thus, he concludes that these instances have to be construed with an ‘inter-subjective’ interpretation. Moreover, he considers most occurrences found in his corpus study “perfectly neutral” and compatible with both a ‘subjective’ and an ‘inter-subjective’ interpretation.

Turning to epistemic adjectives, Lyons (1977: 806) assumes that patterns like *it is possible that*, *there is a possibility that* are more appropriate to express an ‘objective’ epistemic modality than the modal verb *may*. More radically, Perkins (1983: 67) concludes that all epistemic expressions in predicative copula constructions are restricted to an ‘objective’ epistemic interpretation. This view is, by and large, supported by Nuyts (2001b: 389), who argues that ‘subjective’ uses of epistemic adjectives are possible in principle, though they are very rare.

Finally, Perkins (1983: 101) suggests that there are more factors that govern the realisation of epistemic modality. Apart from the respective category, the lexical semantics of the respective item seems to play a role. As he argues, *possibly*, *it’s possible* and *there’s a possibility* are inherently ‘objective’ epistemic.

Summing up, among the researchers that assume a differentiation between an ‘objective’ and ‘subjective’ epistemic modality, there is no clear consensus as to whether the expression of these modalities is restricted to particular categories. Nevertheless, the majority of these authors concludes that epistemic adverbs strongly prefer a ‘subjective’ epistemic interpretation, whereas epistemic adjectives prefer an ‘objective’ epistemic interpretation. These assumptions reflect the fact that epistemic adjectives occur much more readily in environments in which epistemic adverbs hardly occur.

Given that a differentiation between an ‘objective’ and a ‘subjective’ epistemic modality does not exist, how is it possible to account for these contrasts? Similarly to epistemic modal verbs, epistemic adverbs and epistemic adjectives involve a variable for a deictic centre. It is plausible to assume that there are different conditions for adjectives and adverbs, and differences with respect to how this variable

is anchored to an appropriate epistemic agent. As it seems, epistemic adjectives can be bound more locally, and, thus, it is less likely that something prevents the anchoring to this agent. In contrast, adverbs seem to underly stricter conditions of anchoring.

As it turns out, it is fairly contested what the true nature of ‘objective’ epistemic modality could be. Most of the approaches remain rather sketchy and only discuss a small amount of selected lexical items for each category. The most comprehensive study, presented by Nuyts (2001a) and Nuyts (2001b), essentially departs from some of Lyons’ original assumptions. In particular, the concept ‘objective’ modality is replaced by the concept of ‘inter-subjective’ modality.

4.22.3 The role of public evidence

In contrast to the original proposal made by Lyons (1977), the most elaborate contemporary approaches assume a distinction between ‘objective’ and ‘subjective’ epistemic modality and invoke an evidential dimension. Authors such as Diewald (1999: 79, 210), Nuyts (2001b: 393), Papafragou (2006: 1697) and Huitink (2008) implicitly or explicitly rely on the concept of public evidence. They conclude that ‘subjective’ epistemic modal operators involve evidence that is accessible to the speaker alone, whereas ‘objective’ epistemic modal operators involve evidence that is accessible to a larger group of people.

However, as already shown in Section 4.15, the concept of public evidence is impossible to model. The most obvious approach would be to regard it as a certain set of propositions *E* that is part of the knowledge of a larger group. Based on this set of propositions, each person that is part of this larger group should make the same assumptions or conclusions. This sort of approach only succeeds if there is ‘objective’ epistemic reasoning which only takes into consideration the part of the knowledge that is labelled as public evidence. Otherwise, if the ‘objective’ epistemic evaluation involved the entire individual knowledge of a speaker, it is not obvious how everyone would reach the same conclusions. Any account of ‘objective’ epistemic modality that is based on public evidence has to assume that there is a separate sort of reasoning which only affects the knowledge labelled as ‘public evidence’, and that ignores the rest of the knowledge. Such an assumption is very unnatural and requires independent neurological and psychological evidence.

Moreover, there are instances of ‘objective’ epistemic modal verbs for which the accessibility of the evidence does not at all play any role at all. Huitink (2008) assumes that quantifiers can only take scope over ‘objective’ epistemic modal verbs. As was illustrated in Section 4.20, the accessibility of the evidence does not play a role in any of her own examples. They are perfectly acceptable even if

the underlying evidence is accessible to the speaker alone. Thus, the reason why epistemic modal verbs can occur in the scope of a quantifier is not related to the degree of accessibility of the evidence.

This indicates that public evidence is a concept that presupposes unnatural assumptions about human reasoning. Moreover, it does not account for the phenomena it was originally designed for.

4.22.4 Objective epistemic modal verbs do not constitute a consistent class

There are numerous properties which have been claimed to be essential for ‘objective’ epistemic modal verbs. However, upon closer inspection, it turns out that most of these properties only apply to individual modal verbs, rather than the entire group which is regarded as ‘objective’ epistemic. First of all, there are hardly any clear statements as to which members the class of ‘objective’ epistemic modal verbs exactly comprises. In the original approach, Lyons (1977) almost exclusively discusses the ‘objective’ epistemic uses of *may*. Furthermore, he briefly mentions ‘objective’ epistemic variants of *must* (p. 797) and *can’t* (p. 801). Yet, there is no systematic enumeration of modal verbs that he explicitly considers as being capable of encoding an ‘objective’ epistemic modality. Watts (1984: 133) argues that *can* is never interpreted in a ‘subjective’ epistemic way, only in an ‘objective’ one. Tancredi (2007) and Huitink (2008: 4) seem to assume that epistemic modal verbs generally involve an ambiguity between ‘subjective’ and ‘objective’ epistemic modality.

As far as German is concerned, the most explicit classification has been contributed by Öhlschläger (1989: 192), who argues that three modal verbs tolerate an ‘objective’ epistemic interpretation, *können*, *müssen* and *dürfte*. Similarly, Kratzer (1981: 58) claims that *dürfte* is ‘objective’ epistemic. Other authors, such as Diewald (1999: 82–84, 274), only provide examples of *können* and *müssen*. However, she almost exclusively discusses instances of *können*.

The fact that some authors, such as Lyons (1977), Diewald (1999: 82–84), Tancredi (2007) and Huitink (2008), almost exclusively focus on the ‘objective’ epistemic uses of possibility verbs should raise some suspicion. The corpus study presented here reveals that a whole range of the essential properties for objective epistemic modal verbs that have been suggested in literature only apply to individual modal verbs, rather than the entire class of ‘objective’ epistemic modal verbs, no matter what extension is chosen. In particular, there is a clear asymmetry between possibility modal verbs and necessity modal verbs. The former are more flexible in their distributions, the latter are more restricted. In the remainder of this section, the three most revealing contexts which have been claimed to be

essential for the discrimination of ‘objective’ epistemic modal verbs will be briefly discussed: (i) questions, (ii) scope of negation and (iii) scope of a quantifier.

First of all, Lyons (1977: 799) assumes that ‘objective’ epistemic modal verbs can occur in questions. In a similar vein, Watts (1984: 133) observes that ‘objective’ epistemic *can* occurs in polarity question, whereas epistemic *may* is excluded from such contexts:

An epistemic interpretation of *may* in *yes/no*-questions appears to be impossible. In the case of (9) and (10), however, what the speaker is questioning is whether the proposition is objectively possible, not what he himself believes possible.

As he argues, the incompatibility of *may* with polarity questions is due to its ‘subjective’ interpretation. However, his reasoning has interesting consequences. As he assumes that *may* can optionally express ‘objective’ epistemic modality, it would be expected to be acceptable in questions, much in the way ‘objective’ epistemic *can* is. These facts, in turn, lead Watts (1984: 138) to the conclusion that “unless *may* is combined with one of the two modal adverbs *possibly* and *perhaps*, however, it will almost certainly be interpreted subjectively.” Accordingly, most of the uses of *may* that are traditionally regarded as ‘objective’ epistemic would turn out to be ‘subjective’ epistemic. Although his reasoning seems to be unconventional, Watts (1984) is nevertheless on the right track, as he addresses an important question: Why is it that *can*, with a possibility reading, is so much more acceptable in questions than *may* is? This remains mysterious for any account which assumes that *may* involves an ‘objective’ epistemic interpretation. There is a more efficient explanation. As has been illustrated by Hofmann (1976: 94), Coates (1983: 85), Sweetser (1990: 62), Brennan (1993: 14) and Drubig (2001: 43), the possibility verb *can* is special in that it does not involve an epistemic reading but just a pure possibility reading, as was shown in Section 3.3. This explains why it can be used almost without restrictions in questions. By contrast, *may* does not seem to involve such a pure possibility reading; thus, it is always epistemic when it does not express non-deontic possibility. As ‘subjective’ epistemic modal verbs require particular conditions in order to be felicitously used in information seeking questions, it becomes obvious why it is less acceptable in such a context, as opposed to its non-epistemic relative *can*.

Likewise, there are only a couple of German epistemic modal verbs that are attested in questions. As was demonstrated in Sections 4.11 and 4.12, there are only three epistemic modal verbs which could be found in questions in the corpus study presented here: *kann*, *könnte* and *dürfte*. Roughly speaking, they correspond to the group of verbs that Öhlschläger (1989: 192) regards as ‘objective’ epistemic. However, as has been pointed out, all of these corpus examples rather

exhibit a ‘subjective’ epistemic interpretation. Accordingly, the existence of configurations in which epistemic modal verbs occur in questions does not justify the assumption of an independent ‘objective’ epistemic modality. If it was indeed a typical property of an ‘objective’ epistemic modal verb to be acceptable in interrogative contexts, it would remain mysterious why there are no examples of (‘objective’) epistemic *müssen* in these contexts. As it turns out, epistemic modal verbs only occur in questions under particular conditions. But this restriction cannot be adequately accounted for by assuming that all of the relevant instances form a consistent subclass which expresses ‘objective’ epistemic modality. Rather, it is due to the interplay of idiosyncratic features of each lexical item.

Secondly, Öhlschläger (1989: 207) argues that it is a particular property of ‘objective’ epistemic modal verbs that they can occur in the scope of negation whereas their ‘subjective’ correlates cannot. As was shown in Section 4.10, epistemic *können* and *müssen* are indeed frequently attested in the scope of negation. Furthermore, there are a few occurrences of epistemic *brauchen* in the scope of negation. In contrast, epistemic *dürfte* does not seem to be compatible with wide scope negation. The negated instance of epistemic *dürfte* discussed by Öhlschläger (1989: 88) is far less natural than epistemic *können*, *müssen* and *brauchen* in the scope of negation – if it is acceptable at all. This was extensively discussed in Section 4.10. The lower degree of acceptability would remain mysterious if *dürfte* did indeed exhibit an ‘objective’ epistemic interpretation. Alternatively, it is possible to conclude that negation may also affect ‘subjective’ epistemic modal operators. This type of approach is adopted by an increasing number of authors, such as Butler (2003: 984), Fintel and Iatridou (2003: 184), Papafragou (2006: 1694), Moscati (2006: 31) and Homer (2010: Sect. 3.1). Even Öhlschläger (1989: 208) concedes at some point that subjective epistemic modal verbs can be affected by negation. In that, he follows Lyons (1977: 801), who discussed relevant examples already.

Thirdly, Huitink (2008) claims that it is the very nature of ‘objective’ epistemic modal verbs that they are able to occur in the scope of a quantifier (or universal free choice item). As was demonstrated in Section 4.20, this property does not apply to all of the modal verbs which are consensually regarded as ‘objective’ epistemic. As for German, the configurations discussed by Huitink (2008) are only attested for *kann* and *könnte*. This holds in a similar way for the cases provided by Tancredi (2007). All of the examples involve the same lexical item: *may*. In total, this picture corresponds exactly to the observation made by Lyons (1977: 801–802), who came to the conclusion that epistemic possibility verbs are more flexible in their distribution.

Summarising, the availability of epistemic modal verbs in non-canonical contexts is not governed by an independent ‘objective’ epistemic sub-category. If this

were the case, we would expect that all of the items which are regarded as ‘objective’ epistemic modal verbs should occur in the relevant environments. The acceptability of epistemic modal verbs is rather due to an interplay of idiosyncratic features. The most flexible epistemic verbs in German reviewed here are the possibility verbs *kann* and *könnte*: They are the most frequent epistemic modal verbs in conditional *wenn*-clauses, in information-seeking questions, in the scope of negation or free choice items, and they are also attested in non-finite contexts. These modals are followed by *dürfte*, which occurs in questions and many adverbial clauses, and the necessity modal *müssen*, which occurs rarely in the scope of negation or in a non-finite form. The behaviour of each individual epistemic modal verb with respect to the non-canonic environments that are relevant here is illustrated in Table 4.1. The judgements reflect the findings of the corpus study presented in the preceding sections. ‘Yes’ indicates solid corpus data, ‘no’ shows that no data has been found and that any made-up example appears to be ungrammatical to an average native speaker. A blank indicates that no investigation has been carried out so far, and that it cannot be excluded that the relevant pattern is indeed in use.

As can be seen, objective epistemic modality is a dustbin category that encompasses all of the cases of epistemic modal verbs which could not be accounted for by traditional accounts of epistemic modality. The examples that should justify the existence of an independent category of ‘objective’ epistemic modality are very selective and sporadic. For hardly any characteristic has it been empirically proven that it applies to all of the modal verbs which are said to involve an ‘objective’ epistemic interpretation. Under these circumstances, it seems advisable to refute the concept of objective epistemic modality, unless it can be demonstrated that each verb which is regarded as ‘objective’ epistemic occurs in all environments which are only compatible with ‘objective’ epistemic modality, but never with ‘subjective’ epistemic modality.

4.22.5 ‘Objective’ modal verbs that are practical possibility or quantificational modal verbs

In what follows, it will be demonstrated that some of the instances which are generally treated as ‘objective’ epistemic modal verbs do not involve any epistemicity at all. Furthermore, it will turn out that they can alternatively be analysed as practical possibility or quantificational modal verbs.

As was shown in Section 2.1.3, the most efficient way to define epistemicity is to follow the assumptions made by Westmoreland (1998: 12) and Ziegeler (2006: 90), who argue that a speaker who employs an epistemic operator signals

Tab. 4.1: Epistemic modal verbs in non-canonical environments

environment	<i>kann</i> (very rare)	<i>muß</i>	<i>dürfte</i>	<i>könnte</i>	<i>mögen</i> (rare)	epist. adverbs	part. <i>wohl</i>
factive complement							
causal		yes	yes	yes	yes	yes	yes
temporal		yes (yes)	yes	yes	yes		yes
conditional	no	no	yes	?yes	no		no
negation	yes	yes	no	no	no	no	no
questions	yes	no	yes	yes	no		yes
quantifiers	yes	no	no	yes	no	no	
infinitive	yes	yes	no	no			
German							
Öhlschläger (1989: 207, 210)	obj./subj.	obj./subj.	obj./subj.		subj.	subj.	
Diewald (1999: 82–84, 274)	obj./subj.	obj./subj.				subj.	
Dutch							
Nuyts (2001a), Nuyts (2001b: 392–393)	obj./subj.						obj./subj.
Huitink (2008)	obj./subj.	obj./subj.					

that the modified proposition is not part of his knowledge. In order to apply this condition, the epistemic operator needs to be anchored with respect to an agent, which is the speaker in the most canonical case. This is the essence of what is called ('subjective') epistemic modality. Upon closer inspection, it turns out that quite a lot of the instances which are regarded as 'objective' epistemic modal verbs do not meet these criteria. Diewald (1999: 82–84) provides a couple of examples of 'objective' epistemic modal verbs in German, which are intended to highlight their particular nature, as is illustrated in examples (894), (895) and (896):

- (894) Können die Personen bei dringendem Tatverdacht festgenommen
 can the persons at immediate suspicion arrest-PPP
 werden?
 PASS.AUX-INF
 'If they are suspected immediately, can it happen that the persons will be arrested?'
- (895) Ich wußte, daß die Personen bei dringendem Tatverdacht
 I knew that the persons at immediate suspicion
 festgenommen werden können.
 arrest-PPP PASS.AUX-INF can
 'I knew that, if the persons were immediately suspected, they could be arrested.'
- (896) Es dürfte regnen können.
 it may.SBJV.PST rain can-INF
 'It is probable that it can rain.'

Aside from their dominant deontic interpretation, the modal verb *können* in examples (894) and (895) also exhibits a non-deontic possibility reading. But crucially, these utterances are compatible with situations in which the deictic centre knows exactly that the suspicious persons were indeed arrested in at least one case.²⁰⁴ Likewise, example (896) can be paraphrased as *I assume that it happens sometimes here that it rains*. In both cases, *können* seems to act as a quantifier over time intervals. Accordingly, it behaves exactly like a quantificational modal verb in terms of Brennan (1993: 97). By contrast, an epistemic modal verb can never be used in a situation in which the deictic centre knows that the modified proposition is true. In such a context, it will always be conceived as infelicitous.

204 As the utterance in example (894) involves a question operator, a context shift is induced in which the deictic centre is identified with the addressee, as is shown in Section 4.11.

4.22.6 'Objective' epistemic modal verbs that are 'subjective'

Having demonstrated that a large part of 'objective' epistemic modal verbs can be more efficiently captured as circumstantial modal verbs, it will be shown here that there is no compelling reason that prevents us from analysing the remaining part as 'subjective' epistemic modal verbs.

Among the current most elaborate proposals concerning 'objective' epistemic modality, there is almost general consensus that the essential difference between these two types of epistemic modal operators concerns the accessibility of the evidence. Nuyts (2001b: 393), Papafragou (2006: 1694) and Huitink (2008) argue that the main characteristic of 'objective' epistemic modal verbs is that the epistemic evaluation is based on evidence that is accessible to a larger group of people. According to Fintel and Gillies (2011: 115), Papafragou (2006: 1694) concludes that 'subjective' epistemic modals are the limiting case in which the speaker is the only member of the group, and hence bases the modal claim on his or her private beliefs.

In order to prove the existence of 'objective' epistemic modal verbs, it is necessary to demonstrate that there are instances which are only acceptable if there is at least one further attitude holder who reaches the same epistemic conclusion as the specified deictic centre – and this is very hard to prove. In a 'subjective' scenario, the deictic centre draws the conclusion p based on his private evidence E , as is illustrated in example (897). In contrast, an 'objective' scenario includes more acts of concluding, as demonstrated in example (898).

(897) deictic centre d_i concludes p based on the private evidence E_i

(898) deictic centre d_i concludes p based on the public evidence E
referent x_1 concludes p based on the public evidence E

...

referent x_n concludes p based on the public evidence E

It merits closer attention that the objective scenario always includes the subjective scenario, depending on how one phrases the difference between private and public evidence. As already pointed out in Sections 4.15 and 4.22.3, the concept of public evidence is problematic and moreover makes wrong empirical predictions. Furthermore, it is doubtful whether the mind has a discrete mechanism of reasoning which only operates based on the set of propositions labelled as public evidence, ignoring any other knowledge.

So how is it possible to account for the 'objective' resonance with which epistemic modal verbs occasionally seem to be associated? Alternatively, one could assume that the judgements and evaluation that have been undertaken by other

referents are part of the deictic centre's knowledge or private evidence. What the deictic centre does in his own act of epistemic reasoning is to refer to evaluations made by other judges, as is illustrated in (899).

- (899) deictic centre d_i concludes p based on the private evidence E_i
 (whereas E_i includes judgements by other referents x_1 - x_n that are relevant to p)

As has been demonstrated above, the individual knowledge (private evidence) independently plays a crucial role for the definition of ('subjective') epistemic modality. A speaker who employs an epistemic operator indicates that the modified proposition is not part of his knowledge. In the case of public evidence, this is different. Thus, it appears to be much more reasonable to adopt an account that is based on the knowledge of the deictic centre, rather than the concept of public evidence, which is problematic for various reasons.

The consequence of the proposal outlined here is that 'objective' or 'inter-subjective' epistemic modality becomes a subtype of 'subjective' epistemic modality – except for those examples that have already been identified as practical possibility or necessity modal verbs, or quantificational modal verbs. Any approach that insists on claiming the existence of an independent 'objective' epistemic modality has yet to demonstrate that there are contexts in which this difference plays a role. As has been shown in the last sections, all of the environments that have been claimed to be restricted to 'objective' epistemic operators can host operators with a 'subjective' epistemic interpretation. Thus, a distinction between 'objective' and 'subjective' epistemic operators cannot be motivated in distributional terms. This makes any attempt to formulate such a distinction irrelevant for linguistic theory.

Interestingly, Nuyts (2001b: 393) relativises the importance of the acceptability in different environments for the distinction between 'subjective' and 'inter-subjective' modal verbs. As he puts it, "these behavioural properties have little or nothing to do with the issue of subjectivity". The difference between 'subjective' and 'inter-subjective' modality boils down to a difference in the accessibility of the underlying evidence that has no implication for the syntactic or semantic behaviour of these items.

4.22.7 Conclusions

In the previous sections, it has been demonstrated that the assumption of an independent 'objective' epistemic modality is misleading. Firstly, all of the instances of modal verbs which were claimed to involve an 'objective' epistemic modal in-

terpretation do not constitute a homogeneous class. In particular, most of the essential characteristics that are attributed to this class only apply to individual members but never to all of them. As was illustrated, these inconsistencies are not surprising: On the one hand, the class of ‘objective’ epistemic modal verbs encompasses items which indicate that the modified proposition is part of the speaker’s knowledge. Accordingly, they fulfil the central criterion of being ‘subjective’ epistemic modal verbs. On the other hand, this class contains items which do not fulfil this criterion. Thus, they behave like circumstantial modal verbs in the most crucial respect. Finally, some idiosyncratic properties of some particular epistemic modal verbs have been mistaken to be essential characteristics of ‘objective’ epistemic modality.

Aside from its lack of consistency, the concept of ‘objective’ epistemic modality faces at least two more serious challenges: It has been illustrated above that it is grounded on problematic concepts such as ‘public evidence’, and it is not plausible from a diachronic perspective.

But what requires the assumption of an independent ‘objective’ epistemic modality in the first place? This assumption only becomes necessary if one considers that epistemic modifiers are a type of operator that is external to the proposition, or even external to the illocution. Most accounts in the tradition of Lyons (1977) conclude that epistemic modality is a proper illocutionary force, and utterances containing an epistemic modifier are to be seen as an independent type of speech act. As it is commonly assumed that illocutionary operators are excluded from a couple of environments, such as questions or embedded clauses, such approaches would lead us to expect that epistemic modal verbs, being illocutionary operators, should also be banned from these contexts. It has become apparent that there were some instances of epistemic modal verbs which were recorded in these non-canonical contexts. Maintaining the hypothesis that epistemic modal verbs are illocutionary modifiers, authors in the tradition of Lyons (1977) have concluded that these instances have to be another type of epistemic modal operator. This is the easy solution for this conflict: epistemic modal verbs are speech act modifiers, and whenever they occur embedded in contexts from which they should be excluded, they involve another type of epistemic modality.

Refuting the concept of ‘objective’ epistemic modality, an alternative explanation becomes necessary for all of those instances of epistemic modal verbs which occur embedded in complement clauses, adverbial clauses, in questions or in the scope of negation. Firstly, it cannot be challenged that epistemic modal verbs are more easily interpreted in some environments rather than in others. Yet, the question arises of how this difference of acceptability can be accounted for. As has been illustrated above, the essential nature of epistemic operators is to indicate that the embedded proposition is not part of the knowledge of a particular attitude holder.

In order to specify an epistemic operator for its attitude holder, the variable for the deictic centre has to be bound by an appropriate attitude holder. As it seems, the establishment of such a binding relation comes with specific conditions. Obviously, the deictic centre of an epistemic operator will always be anchored to the most local referent who is an appropriate attitude holder. This referent is the speaker in the case of non-embedded utterances containing an epistemic operator. However, if this utterance is embedded by a predicate which involves an argument that can be interpreted as an epistemic agent, the most local attitude holder is the referent of this argument. Some operators may alter these conditions, e.g. question operators. Other operators may block the identification of the deictic centre, such as volitional operators. This account is further supported by the fact that even elements which are commonly considered as unambiguously ‘subjective’ epistemic occur in non-canonical contexts, e.g. epistemic adverbs such as *vielleicht*, and epistemic discourse particles such as *wohl*. These occurrences remain unaccounted for under an account that is based on the distinction between ‘objective’ and ‘subjective’ epistemic modality. Thus, it is more efficient to explain the different degrees of acceptability of epistemic modal verbs in non-canonical contexts in terms of anchoring conditions. How such analyses could be spelled out in more detail will be demonstrated in Chapter 6.

In order to maintain an account that distinguishes between ‘objective’ and ‘subjective’ epistemic modality, it would be necessary to test a couple of hypotheses. Firstly, it remains to be shown that there are modal verbs which can be captured neither by the analysis of epistemic modal verbs, nor by the analysis of practical possibility/necessity or quantificational modal verbs presented here. Secondly, it has to be demonstrated that the degree of accessibility of the underlying evidence has an impact on the acceptability of epistemic modal verbs in non-canonical contexts. Thirdly, it should be shown that the characteristics which are attributed to the class of ‘objective’ epistemic modal verbs indeed apply to each of its members. Unless this is done, the concept of objective epistemic modality remains full of pitfalls and illusions. Thus, it is appropriate to abandon this idea.

4.23 Summary

The main result of the present corpus survey is that epistemic modal verbs are much more flexible with respect to the environments in which they can occur. There are no more than eight out of twenty-one non-canonical environments in which epistemic modal verbs could not be found: (i) they do not occur with verbless directional phrase complements, (ii) they cannot be separated from their infinitive complements in *wh*-clefts, (iii) they do not undergo nominalisation, (iv)

they are banned from adverbial infinitives, and finally, (v) they cannot be embedded under circumstantial modal verbs, (vi) predicates of desire, (vii) imperative operators or (viii) optative operators. These conclusions are very similar to the ones reached by Eide (2005: 9) for Norwegian. Apart from that, there are a couple of further environments in which epistemic modal verbs are at least exceptional, if not impossible, such as event-related conditionals, participles under a perfect tense auxiliary and temporal *wenn*-clauses. In all of the remaining environments, epistemic modal verbs become interpretable if particular conditions are fulfilled.

How can the decrease of acceptability of epistemic modal verbs in non-canonical contexts be accounted for? There are a couple of competing accounts. Approaches in the tradition of Lyons (1977) assume that there are two types of epistemic modality. The first type is ‘subjective’ epistemic modality, which constitutes an independent illocutionary force and which is external to the proposition. Accordingly, it is expected for ‘subjective’ epistemic modal modifiers to be excluded from the scope of operators that only bear scope over the proposition. In order to account for the existence of epistemic modal verbs which nevertheless occur in these environments, authors arguing in favour of this type of approach assume that the relevant occurrences involve a different type of epistemic modality: ‘objective’ epistemic modality. But as the results of the corpus study have shown, the concept of ‘objective’ epistemic modality suffers from essential shortcomings. First of all, the essential characteristics postulated for the class of ‘objective’ epistemic modal verbs do not apply to all of the elements that are considered members of this class. Furthermore, all of the known examples of ‘objective’ epistemic modal verbs can alternatively be captured as either circumstantial verbs or canonical (‘subjective’) epistemic modal verbs. This indicates that the concept of ‘objective’ epistemic modality should be abandoned unless it can be shown that there is a consistent class of verbs to which it applies. Likewise, the constraints postulated by Coates (1983: 242) (‘The Principle of Inviolability of Epistemic modality’) and Drubig (2001: 11) (‘restriction to assertive contexts’) cannot explain the occurrences of epistemic modal verbs in non-canonical contexts. In a similar fashion, accounts which assume that epistemic modal verbs are realised as a proper functional category which is restricted to finite environments fail to account for the data presented in this section, such as the analyses developed by Wurmbrand (2001: 184) and Erb (2001: 102).

All of these accounts face a further challenge. As was demonstrated in the preceding sections, the deictic centre, which is in charge of the epistemic evaluation, is not identified in the same way in every context: Whereas it is anchored to the speaker in non-embedded assertions, it is anchored to an appropriate matrix argument if the epistemic operator occurs in an embedded clause, or to the addressee in information seeking questions. Hence, the orientation of the deictic centre is

Tab. 4.2: Anchoring of epistemic modal operators in embedded contexts

distribution	deictic centre
infinitive (embedded by attitude predicate)	matrix argument
information seeking polarity question	addressee
information seeking <i>wh</i> question	addressee
non-factive complement clauses	matrix argument
factive complement clauses	matrix argument
	other salient referent
	speaker
event-related causal clause	matrix argument
	speaker
event-related conditional clause	addressee?
	speaker??
temporal clauses (with out generic <i>wenn</i> -clauses)	speaker
generic <i>wenn</i> -clauses	matrix argument
restrictive relative clause	speaker

governed by the environment, as is illustrated in Table 4.2. This phenomenon remains unexplained in all of the analyses sketched above. Any account of epistemic modality has to involve some sort of variable designated for the attitude holder who undertakes the epistemic evaluation.

Moreover, most of the accounts discussed above assume that the class of epistemic modal verbs is homogeneous or that there are homogeneous ‘objective’ and ‘subjective’ epistemic subclasses. But as has been shown, each lexical item is acceptable in different non-canonical contexts. Whereas epistemic *dürfte* is more compatible than the average with temporal clauses, it cannot occur in a non-finite form, or in the scope of negation or a universal free choice item.²⁰⁵ In contrast, epistemic *kann* is frequent in the scope of negation or a free choice item, but it hardly occurs in adverbial clauses. Furthermore, epistemic *könnte* turns out to be very flexible, in the sense of being acceptable in event-related conditional clauses, in information seeking questions and in the scope of a universal free choice item, while it is impossible in the scope of negation. In opposition to this, epistemic *muss* is attested in the scope of negation but excluded from information seeking questions. These findings are reflected by the findings of Hacquard and Wellwood (2012: 22), who have observed that English exhibits a Modal Force Asymmetry: The epistemic possibility verb *might* occurs much more readily in questions and embedded clauses than its counter part *must*, which refers to an epistemic necessity.

In order to account for the behaviour of epistemic modal verbs in non-canonical contexts, it is necessary to take into account all of the idiosyncratic lexical features that the relevant verb involve. In a broad range of contexts, an

epistemic modal verb is not excluded because of its epistemicity alone, but rather due to a complex interplay with other lexical properties, such as the modal force or subjunctive meaning. Once again, any attempt at an adequate description of epistemic modal verbs has to consider the idiosyncratic lexical properties of each individual verb.

The alternative account developed here is based on the assumption that an epistemic operator always has to be interpreted with respect to the knowledge of a particular attitude holder. In order to do so, the attitude holder has to be identified. However, the establishment of such an anchoring relation between the variable for the deictic centre provided by the epistemic operator and an appropriate attitude holder seems to be subject to clear conditions. As will be demonstrated in further detail in Chapter 6, the epistemic operator has to be linked to the most local index which refers to an appropriate attitude holder. In such a configuration, certain operators must not intervene. Epistemic modal operators fail to be embedded under circumstantial modal verbs, predicates of desire, imperative operators and optative operators for the same reason. A volitional modal operator intervenes between the epistemic modal operator and the most local appropriate referent who is an attitude holder. Likewise, adverbial infinitives are headed by a modal operator. As a consequence, this modal operator intervenes between the epistemic modal operator and any attitude holder who is realised externally to the infinitive complement. Quite a lot of the non-canonical contexts reviewed above appear to involve an intervening modal operator, which prevents the epistemic modal operator from being anchored to an appropriate attitude holder. Nevertheless, this is not the only reason why epistemic modal operators can be excluded from a particular environment. The reason why they do not occur with verbless directional phrase complements, and why they cannot be separated from their infinitive complements in *wh*-clefts, may have something to do with their selectional restrictions. The type of complement with which they occur with in these environments is not suitable to denote a proposition and, furthermore, it has to be co-referential with a predicate which involves an event argument.

Finally, the question of what position epistemic modal operators occupy with respect to the proposition will not be fully answered here. There is a lot of evidence in favour of the view held by Papafragou (2006: 1693). She suggests that epistemic modal operators form part of the proposition, as they can occur in central adverbial clauses and in the scope of negation. The study by Hacquard and

205 Yet, there are authors, such as Öhlschläger (1989: 88, 208), who argue that epistemic *dürfte* can be interpreted in the scope of negation. As was demonstrated in Section 4.10, it is far from obvious to what extent his examples obtained from introspection indeed involve a wide scope interpretation of the negation.

Wellwood (2012: 2-4) comes to a similar conclusion, based on evidence that epistemic modal verbs in English occur in antecedents of conditional clauses, embedded in information seeking questions and embedded under attitude predicates. The corpus study presented here could provide further support for this position. Moreover, it is evident that epistemic modal operators have to contribute to the truth conditions: An epistemically modified utterance requires a deictic centre with respect to whose knowledge the operator is evaluated. Furthermore, the knowledge must not contain the modified proposition. Otherwise, the epistemically modified utterance is false. However, the data from epistemic modal operators in information seeking questions could be interpreted differently. Epistemic modal operators in these configurations seem to yield the same interpretation as the one suggested by Zimmermann (2004: 263) for the discourse particle *wohl* in questions. As he argues, these operators have to be outside the proposition in order to make the right prediction in a Hamblin style analysis. As this matter is non-trivial, a solution for this issue will be left to future research.

5 Reportative and evidential modal operators

While the preceding chapter was dedicated to the environments in which epistemic modal verbs fail to occur, the present chapter deals with environments from which verbs with reportative and evidential semantics are banned. As it happens, there are contexts in which epistemic modal verbs are ruled out while reportative modal verbs are not. This difference enables us to determine the nature of epistemic modal verbs on the one hand, and reportative modal verbs and evidential verbs on the other.

5.1 Reportative *wollen* and *sollen*

As was shown in Sections 2.2.3.7 and 2.2.6.4, *wollen* and *sollen* introduce an experiencer argument, to which a volition can be attributed. In their canonical interpretations, these verbs refer to a wish or desire that a certain event or state should come true. In their reportative interpretations, these verbs express the more specific wish that the (potential) addressee should add the embedded proposition to the Common Ground. In this respect, reportative modal verbs express the volitional component of declarative speech acts, which has been described by Truckenbrodt (2006: 263–268) in much detail.

Analogous patterns with the counterpart of *sollen* can also be found in other Germanic languages such as Dutch, Danish, Norwegian and Icelandic, as has been pointed out by Mortelmans, Boye and Auwera (2009) and Eide (2005: 393).

In Chapter 3, it has been demonstrated that the volitional interpretations of *wollen* and *sollen* relate to their reportative variants in a way analogous to the way the remaining circumstantial modal verbs relate to their epistemic variants. Volitional and other circumstantial modal verbs fail to embed predications consisting of an identified individual and a predicate that refers to a state which cannot be changed, or to an event in the past. By contrast, reportative instances of *wollen* and *sollen* are perfectly acceptable with such types of predicates, just as epistemic modal verbs are.

Yet, there are differences between reportative modal verbs and their epistemic counterparts. They become most evident as soon as the environments are taken into consideration where these operators cannot occur. As pointed out by Doherty (1985: 118–119), Öhlschläger (1989: 236) and Reis (2001: 294, 296), the reportative uses of *wollen* and *sollen* systematically occur in environments from which epistemic modal verbs are categorically excluded. This entails that reportative modal verbs differ in essential respects. In what follows, only a selection of the non-

<https://doi.org/10.1515/9783110411027-005>

environments for epistemic modal verbs which have been discussed in the previous chapter will be reviewed. In particular, the present chapter will focus on environments in which reportative modal verbs are attested while epistemic modal verbs are not.

Two types of environments have to be distinguished. Firstly, there are environments in which epistemic modal verbs are categorically ruled out while their reportative counterparts are not, such as (i) adverbial infinitives and infinitives which are embedded under an auxiliary, (ii) past participles that are embedded under a perfect tense auxiliary, (iii) nominalisations, and (iv) optatives.

And secondly, environments can be found in which both types of modal verbs are acceptable, but yielding different interpretations. In most of these environments, reportative modal verbs do not undergo a context shift, such as in (v) past tense contexts, (vi) questions, and (vii) antecedents of event related conditionals.

5.1.1 Infinitives

As was demonstrated in great detail in Section 4.1, the use of epistemic modal verbs in non-finite contexts is fairly restricted. Such uses are only well attested in environments in which they are embedded by an attitude verb that introduces an appropriate referent who can serve as an attitude holder. Accordingly, they could not be found under verbs that lack such an attitude holder argument, e.g. tense auxiliaries, in corpora of Contemporary German. At this point, example (632) in Section 4.1 will be ignored, as it has a rather questionable status. Likewise, epistemic modal verbs fail to be embedded in adverbial infinitives. By contrast, reportative modal verbs can occur in both contexts.

5.1.1.1 Infinitive complements of the auxiliary *werden*

As examples (900) and (901), taken from Curme (1922: 322), illustrate, reportative modal verbs can be embedded under the tense auxiliary *werden*. As auxiliaries lack any argument structure, *werden* does not introduce any argument that could be interpreted as an attitude holder. Accordingly, there would be no viable referent who could be identified as the deictic centre. As a result, an epistemic modal verb is excluded from such environments. However, reportative modal verbs are not subject to this condition and, as a consequence, they can be embedded under verbs and auxiliaries that do not provide any attitude holder argument. Yet, another configuration that lacks an appropriate argument that can be identified as the deictic centre is provided by Welke (1965: 81). In example (903), the *zu-*

infinitive complement is selected by the noun *Illusion* ‘illusion’, which does not involve any appropriate argument. An analogous example is given in (904):

- (900) Er wird es wieder nicht gehört haben wollen.¹
 he will it again NEG heard have want-INF
 ‘He will claim again that he didn’t hear it.’
- (901) Ich werde es wieder getan haben sollen.²
 I will it again do-PPP have-INF shall-INF
 ‘It will be said again that I did it.’
- (902) Die SPD wird sich dann sicherlich in die Büsche schlagen. Sie
 the SPD will REFL then certainly in the bush beat-INF she
 wird dann nämlich nicht dabei gewesen sein wollen.³
 will then namely NEG there be-PPP have-INF want-INF
 ‘The SPD will then certainly have taken flight at this point. They will then claim that they did not participate.’
- (903) Alles schon endgültig durchschaut haben zu
 everything already definitely look.through-PPP have-INF to
 wollen, ist höchstens die Illusion selbstzufriedener Kleingeister.⁴
 want-INF is at.most the illusion complacent small.minds
 ‘The claim of having already understood everything is an illusion of complacent small minds.’
- (904) Und schließen einen damit aus. Machen einem die
 and lock one with.that out make one the
 Vermessenheit klar, etwas begriffen haben zu
 impudence clear something understand-PPP have-INF to
 wollen.⁵
 want-INF
 ‘[they] exclude you therefore. [they] make it clear to you how impudent it is to claim that you have understood something.’

Letnes (2002: 108) points out that, aside from its canonical future interpretation, *werden* can alternatively be interpreted as an epistemic modal verb in Curme’s example (900). A natural example for such a configuration is given in (902).

¹ Gloss translated by Curme.

² Gloss translated by Curme.

³ DeReKo: PBT/W16.00215 Protokoll der Sitzung des Parlaments Deutscher Deutscher Bundestag am 27.03.2009.

⁴ As quoted in Welke (1965: 81).

⁵ DeReKo: P96/AUG.30600 Die Presse, 17/08/1996.

Eide (2005: 393) provides similar examples of the Norwegian reportative modal verb *skulle* ‘shall’, ‘is claimed to’, which occurs in non-finite environments.

- (905) Nevøen påstås å skulle være morderen.
 nephew-DEF claim-PASS to shall-INF be-INF the.killer
 ‘The nephew is claimed supposedly to be the killer.’

In this configuration, *skulle* occurs in the infinitive complement of *påstås* ‘it is claimed’.

5.1.1.2 Adverbial infinitives

Crucially, reportative *wollen* is recorded in adverbial infinitives which are headed by the complementiser *ohne* ‘without’, as is illustrated in examples (906) and (907). As pointed out by Eisenberg (2004: 375), adverbial *ohne-zu* infinitives are closely related to adverbial *um-zu* infinitives. In turn, Nissenbaum (2005: 145) and Grosz (2014) have shown that instances of the latter type have to be analysed as patterns which involve a covert modal operator.

- (906) Ohne das Finale von „Casablanca” jemals gesehen haben zu
 without the final fo Casablanca ever see-PPP have-INF to
 wollen, läßt Schlesinger seine bittersüße Romanze wie ein
 want let Schlesinger his bittersweet romance as a
 Remake mit der Bergmann-Tochter ausklingen. Wer’s glaubt
 remake with the Bergmann.daughter die.away who.it believes
 wird selig, der blutleere Versuch eines romantischen
 becomes blessed the exsanguinous attempt a-GEN romantic-GEN
 Thrillers wird dadurch allenfalls nostalgisch.⁶
 thriller-GEN becomes thus at.best nostalgic
 ‘Despite Schlesinger’s claims that he never saw the end of “Casablanca”, his bitter-sweet romance ends as if it was a remake with Bergmann’s daughter – Schlesinger’s claims are hard to believe and his exsanguinous attempt to create a romantic thriller brings about a resonance of nostalgia.’
- (907) Schließlich gab Sabine Marker nach und setzte ihre Unterschrift
 finally gave Sabine Marker after and put her signature
 auf die Erklärung, ohne gewusst haben zu wollen, was
 on the declaration without know-PPP have-INF to want-INF what
 sie da unterzeichnet.⁷
 she there signes

⁶ DeReKo: NUN93/SEP.01173 Nürnberger Nachrichten, 17/09/1993.

‘Finally, Sabine Marker complied and put her signature under the declaration and now she claims that she did not know what she was signing.’

Adverbial *ohne-zu*-infinitives provide an interesting case. They involve a subject argument which is not overtly expressed and which needs to be controlled by an NP. In the most canonical case, this is the subject argument of the matrix clause. Accordingly, the matrix clause has to contain a predicate that introduces an animate subject argument which can be interpreted as an attitude holder.

These patterns could only be documented with reportative *wollen*. It is not yet clear at this point whether they are also compatible with *sollen*.

5.1.2 Past participles

As shown in Section 4.2, the use of epistemic modal verbs as past participles is fairly limited. Such configurations are acceptable only if the perfect tense auxiliary *haben* is inflected for subjunctive of the past. Yet, epistemic modal verbs are ungrammatical as soon as they are embedded under a perfect tense auxiliary which is inflected for indicative mood. As a consequence, epistemic modal verbs are hardly compatible with the canonical perfect tense in Contemporary German.

Yet, this is not the case with reportative modal verbs. As illustrated by Reis (2001: 294), both reportative *wollen* and *sollen* can be embedded under an indicative perfect tense auxiliary displaying the IPP-effect (cf. 908–909). An authentic example is provided by Vernaleken (1861: 96), (cf. 910):

- (908) Hans hat mal wieder an allem unschuldig sein
 Hans has once again on everything innocent be-INF
wollen.
 want-PPP(ipp)
 ‘He will claim again that he didn’t hear it.’
- (909) Hans hat mal wieder an allem unschuldig sein
 Hans has once again on everything innocent be-INF
sollen.
 shall-PPP(ipp)
 ‘It has been claimed again that he didn’t hear it.’

7 DeReKo: NUN10/OKT.03036 Nürnberger Nachrichten, 29/10/2010.

- (910) Einige haben bemerken wollen, dass die thiere die
 some have notice-INF want-PPP(ipp) that the animals the
 eigenschaft der einwohner ihrer länder
 property the-GEN inhabitants-GEN their-GEN countries-GEN
 haben.⁸
 have

'Some claim to have noticed that the animals have the properties of the inhabitants of their particular countries.'

A similar collection of examples can be found in Fagan (2001: 200, 225), who demonstrates that reportative and epistemic modal verbs differ with respect to the degree of acceptability in perfect tense environments.

5.1.3 Nominalisations

As was illustrated in Section 4.5, epistemic modal verbs fail to undergo nominalisation. In opposition to this, reportative *wollen* and *sollen* are attested in such configurations: *Bescheidwissenwollen* 'answer.know-INF.want-INF.NOUN' (cf. 911), *Nicht-gewussthaben-Wollen* 'NEG.know-PPP.have-INF.want-INF.NOUN' (cf. 912) and *Wissensollen* 'know-INF.shall-INF.NOUN' (cf. 913).

- (911) Dieser Mann, der so entschieden die Unmittelbarkeit der
 this man who so resolutely the immediacy the-GEN
 Begegnung gegen jede Art von
 encounter-GEN against each type of
 Bescheidwissenwollen, Wahrheitsanspruch und
 answer.know-INF.want-INF.NOUN truth.claim and
 Rechthaberei verteidigt, soll also keine Ahnung haben, wie
 bossiness defends shall thus no idea have-INF how
 alt seine Tochter ist (nämlich 18)⁹
 old his daughter is (namely 18)

'This man, who defends any type of pretentiousness, truth claim and bossiness in such a resolute manner, does he really have no idea how old his daughter is (namely 18)?'

⁸ Johann Winkelmanns, *Geschichte der Kunst des Alterthums*. Dresden: bei Walther, p.19 1. Kapitel, 3. Stück, (1764).

⁹ DeReKo: NUN03/DEZ.00184 Nürnberger Nachrichten, 02/12/1003.

- (912) Inzwischen hat es auch in Deutschland – Stichwort Daniel
 meanwhile has it also in Germany keyword Daniel
 Goldhagen („Hitlers willige Vollstrecker“) und Jonathan Littell
 Goldhagen Hitler-GEN willing executioners“ and Jonathan Littell
 („Die Wohlgesinnten“) – viel Selbstbesinnung und heftige
 the kindly.ones – much reflection and fierce
 Debatten um individuelle und kollektive deutsche
 debates about individual and collective German
 Nachkriegs-Lebenslügen zwischen Nicht-Wissen und
 post.war.live.lies between NEG.know-INF and
 Nicht-gewussthaben-Wollen gegeben.¹⁰
 NEG.know-PPP.have-INF.want-INF.NOUN give-PPP

‘Meanwhile, there have also been discussions in Germany about individual and collective life-long lies, ranging from ignorance to the denial of knowledge, which have been triggered by Daniel Goldhagen “Hitler’s Willing Executioners” and Jonathan Littell “The Kindly Ones”.’

- (913) Gesamthaft genommen ergibt sich, dass individuelles
 in.total taken yields REFL that individual
 Wissensollen oder Wissenkönnen in bezug
 know-INF.shall-INF.NOUN or know-INF.can-INF.NOUN in relation
 auf den Raubgutcharakter der bei Fischer gekauften Bilder
 to the loot.character the-GEN at Fischer bought picture
 dem Kläger nicht nachgewiesen ist.¹¹
 the complainant NEG approved is

‘In total, it turns out that it has not been proven that anyone could or should have known that the pictures bought from Fischer were loot.’

At this point the question arises why reportative modal verbs are acceptable in such environments whereas epistemic modal verbs are ruled out. This could be due to the degree of argument structure the respective verbs involve. Reportative *wollen* and *sollen* both introduce arguments of their own which encode the deictic centre. Accordingly, the variable for the deictic centre which is introduced by the modal operator can be bound locally. This is not the case with epistemic modal verbs. Their variable for the deictic centre remains unbound.

¹⁰ DeReKo: RHZ09/AUG.06760 Rhein-Zeitung, 10/08/2009.

¹¹ DeReKo: E96/OKT.26335 Zürcher Tagesanzeiger, 16/10/1996.

5.1.4 Optatives

As was shown in Section 4.14, epistemic modal verbs cannot occur in optatives. In contrast, reportative *wollen* is marginally acceptable in such environments. Scholz (1991: 276) has illustrated this claim with the following example.

- (914) ? Wollte Karl doch nicht immer der Beste gewesen sein!¹²
 want-SBJV.PST Karl PART NEG always the best be-PPP be-INF
 ‘(I wish) Karl would not have always claimed to be the best.’

Even if utterances of this type are rather rare, they are possible and to a significantly higher degree acceptable than epistemic modal verbs in optatives are. At this point, the question arises what allows reportative *wollen* to occur in such contexts. In the most canonical case, the optative reflects a wish of the speaker. Accordingly, optatives introduce some sort of volitional operator that takes scope over the proposition. As argued by Cinque (1999: 87) and Eide (2005: 9), epistemic modal verbs cannot be embedded under a circumstantial modal operator. As can be seen, reportative *wollen* is exempt from this condition.

Once again, it seems that the reason for the different behaviour of epistemic modal verbs and reportative modal verbs is due to the status of the variable for the deictic centre which they introduce. In the case of reportative modal verbs, this variable is already bound by an argument of the modal verb itself whereas, for epistemic modal verbs, this variable is left unbound. Obviously, no unbound variable is admitted under a circumstantial modal operator.

5.1.5 Past tense

As was shown in Section 4.3, epistemic modal verbs are fairly restricted in past contexts. They can obtain two types of interpretations. In the more canonical reading, they involve a context shift which concerns the Time of Evaluation. Accordingly, the presence of past morphology indicates that the speaker or some other deictic centre specified by the context made an assumption in the past. This assumption is reported at the Time of Utterance. Typically, the pronunciation of the utterance is temporally detached from the time of the epistemic evaluation. And most often, the person who makes the utterance is identical to the person who makes the evaluation. This interpretation can be called *past speech act event reading*. Apart from that, there is a second interpretation, the *past event reading*.

¹² As cited in Scholz (1991: 277). The acceptability judgement reflect those of the author.

In this configuration, the past morphology on the epistemic modal verb indicates that the Topic Time of the embedded event is shifted to the past. However, this interpretation only arises under conditions which have not been investigated yet. With *konnte*, these readings hardly exist. They are only attested with *musste* and *mochte*.

Turning to the reportative modal verbs, the situation is different. They are characterised by two different properties. Firstly, both of the verbs *wollte* and *sollte* are only documented in one interpretation when they bear past morphology. It roughly corresponds to the *past speech act event reading*. The epistemic evaluation made by the deictic centre is shifted to the past. In the case of *wollte*, the deictic centre is instantiated by the referent of the subject argument of the reportative modal verb; in the case of *sollte*, it is identified with an argument referent who remains covert and who is specified by the context. This is illustrated in example (915) for *wollte*, in example (916) for *sollte* and in example (917) for both verbs.

- (915) Dem gegenüber meinten der 22-jährige Hauptangeklagte, der als
 this opposite said the 22-year.old main.accused who as
 einziger in U-Haft sitzt, und sein Kompagnon,
 only in imprisonment.on.remmand sits and his companion
 Wolfgang Fasching und dessen Freund hätten sich aktiv
 Wolfgang Fasching and his friend have-SBJV.PST REFL actively
 eingemischt und einen der beiden von hinten
 intervened and one the-GEN both-GEN from behind
 festgehalten. Während der Hauptbeschuldigte nur den Freund
 grabbed while the main.accused only the friend
 des FPÖ-Mandatars weggestoßen haben wollte, gab
 the-GEN FPÖ-mandatar-GEN away.pushed have-INF want-PST gave
 sein Kompagnon zwei Faustschläge gegen Wolfgang F. zu. Aber:
 his companion two fist.punches against Wolfgang F. to but
 Einen Aschenbecher wollte keiner der beiden vor
 a ashtray want-PST none the-GEN both-GEN in.front.of
 dem Lokal benutzt haben. Als Wolfgang F. und sein Begleiter
 the bar use-PPP have-INF as Wolfgang F. and his escort
 am Boden lagen, wollten sie auch nicht auf die beiden
 on.the floor lied want-PST they also NEG at the both
 eingetreten haben. Sie seien vielmehr nach den
 kick-PPP have-INF they be-PRS.SBJV rather after the
 Fausthieben geflüchtet.¹³
 fist.punches escape-PPP

'In opposition to that, the 22-year-old main culprit, who is the only one in imprisonment on remand, and his companion, said that Wolfgang Fasching and his friend had actively intervened and that they grabbed one of the two. Whereas the main accused claimed to have only pushed away the friend of the FPÖ-mandatar, his companion admitted two punches against Wolfgang F.. And they claimed that they did not use an ashtray in front of the bar. Likewise, they claimed that they did not kick the two when they were already lying on the floor. Rather, they would have escaped right after the punches.'

- (916) In Handschellen betrat der 26-jährige Angeklagte gestern den in handcuff entered the 26-year-old accused yesterday the Verhandlungssaal im Amtsgericht Gifhorn. Er sollte trial.room in.the district.court Gifhorn he shall-PST Haschisch an einen Minderjährigen verschenkt haben – ein hashish to a minor offer-PPP have-INF a Verbrechen, für das er sich vor dem Schöffengericht crime for that he REFL at the court.of.lay.assessors verantworten musste und das mindestens mit einem Jahr face.charge-INF must-PST and that at.least with a year Freiheitsstrafe geahndet wird.¹⁴ prison.sentence punished is

'The 26 year old culprit entered the trial room at the district court Gifhorn in handcuffs. He was claimed to have offered hashish to a minor, which is a crime for which he had to face a charge at the court of lay assessors and for which one is punished with a prison sentence of at least one year.'

- (917) Swerkow erzählte von irgendeiner üppigen Dame, die er Swerkow told about some voluptuous lady, which he zu guter Letzt so weit gebracht haben wollte, daß sie ihm eine to good last so far get-PPP have-INF want-PST that he him a Liebeserklärung machte (natürlich log er wie gedruckt). Und wie love.confession made (of.course lied he as printed) and how ihm in dieser Affäre sein intimer Freund, irgendein Fürstchen, the him in this affair his intimate friend some Count-DIM the Husarenoffizier Kolja, der dreitausend Leibeigene besitzen hussar.officer Kolja who three.thousand bondsmen own-INF sollte, besonders hilfreich gewesen wäre.¹⁵ shall-PST particularly helpful be-PPP be-SBJV.PST

'Swerkow talked about some voluptuous lady. He claimed that he finally made her confess to him her love (of course he was lying through his teeth.) And how in this

13 <http://www.oe24.at/oesterreich/chronik/wien/Hooligan-verpruegelte-FP-Politiker-Prozess/55847185>, accessed on 10th February 2012.

14 DeReKo: BRZ09/MAR.01458 Braunschweiger Zeitung, 04/03/2009.

affair, an intimate friend, some Count, the Hussar officer Kolja, who was claimed to own three thousand bondsmen, particularly bore a helping hand.'

However, reportative modal verbs differ in one major respect from epistemic modal verbs, i.e. with respect to the past speech act event reading. Epistemic modal verbs introduce a variable for the deictic centre and this variable is most typically anchored to the speaker. By contrast, the variable for the deictic centre which is introduced by reportative modal verbs is always instantiated as an argument referent of the modal verb itself. Whereas the variable is instantiated across several boundaries in the case of epistemic modal verbs, the instantiation of the variable for the deictic centre is a very local configuration in the case of reportative modal verbs. As for epistemic modal verbs, the variable remains open and unbound when the past tense operator is applied. By contrast, the variable for the deictic centre is already instantiated when a past operator is combined with a reportative modal verb.

From this it follows that a deictic centre associated with a reportative modal verb can never be identical to the speaker, and that the person who utters the sentence is always distinct from the person who makes the epistemic evaluation.

Furthermore, the different status of the variable for the deictic centre explains two riddles. Firstly, the observation made by Reis (2001: 294, 296), who has demonstrated that reportative modal verbs occur more readily in past tense contexts, becomes less mysterious. If the variable of the deictic centre is already identified at a very local level, no further conditions for the identification have to be considered. Secondly, it can be explained why epistemic modal verbs undergo a context shift in their past speech act event reading, which was discussed in Section 4.3. In this interpretation, epistemic modal verbs become more like reportative modal verbs: the deictic centre can be identified with a referent who is different from the speaker. At this point, it remains mysterious what enables the variable to be instantiated by another referent. One could assume that a past tense operator with scope over an epistemic operator prefers the variable to be instantiated already, rather than being left open. Accordingly, it is plausible to conclude that a rule of accommodation in the way suggested by Lewis (1979: 172) and Kratzer (1981: 61) applies, which identifies the variable. Even if one assumes that epistemic modal verbs in reported indirect speech are licenced by some type of covert superordinate attitude predicate or verb of saying, one still remains concerned about a free variable under a past tense operator, which is not tolerated in canonical contexts.

15 Fyodor Mikhaylowich Dostoyewsky *Aufzeichnungen aus dem Kellerloch*, translated by Svetlana Geier, 87. (2003).

Accordingly, it is essential to provide an analysis of how the variable of the deictic centre is bound in these contexts.

5.1.6 Questions

As discussed in Section 4.11 and Section 4.12, epistemic modal verbs are subject to certain restrictions when they are embedded in information seeking questions. There are only three epistemic uses which are attested in questions: *kann*, *könnte*, and *dürfte*. Epistemic necessity modal verbs do not seem to be compatible with such environments.

Following the assumptions made by Becker (1836: 181) and Bech (1949: 5, 39), the volitional verbs *wollen* and *sollen*, as well as their reportative counterparts, involve a necessity operator, as demonstrated in Sections 2.2.3.3 and 2.2.6. In contrast to epistemic necessity modal verbs, reportative modal verbs can occur in polarity questions and *wh*-questions, as shown by Doherty (1985: 118–119) and Reis (2001: 296). Both authors stress that reportative modal verbs are significantly more acceptable in information seeking questions than epistemic modal verbs are. Reis (2001: 296) provides examples (918) and (919).

- (918) Will er mal wieder in Prag gewesen sein?
 shall he once more in Prague be-PPP be-INF
 ‘Does he claim again to have been to Prague?’
- (919) Soll er mal wieder in Prag gewesen sein?
 shall he once more in Prague be-PPP be-INF
 ‘Has he allegedly been to Prague again?’

Such configurations are also attested in corpora for *wollen* (cf. 920) and *sollen* (cf. 921–922) in polarity questions.

- (920) Will Uderzo mit dieser Abrundung seines (und Goscinnys)
 wants Uderzo with this completion his-GEN and Goscinnny-GEN
 Lebenswerks vielleicht wirklich endgültig den letzten Band
 lifework maybe indeed definitely the last volume
 herausgebracht haben?¹⁶
 edit-PPP have-INF
 ‘Does Uderzo really want to say that this is definitely the last volume which he has edited of his and Goscinnny’s lifework?’

¹⁶ DeReKo: RHZ96/OKT.06061 Rhein-Zeitung, 10.10.1996.

- (921) Mehr Sorgen macht Mercedes die Unfallursache. „Die Felge hatte more worries makes Mercedes the accident.cause the rim had erst 14 Kilometer drauf, sie war also brandneu“, verrät only 14 kilometres on she was thus brand.new team.manager Teamchef Ron Dennis, der glaubt, dass ein kleines Teil (Stein reveals Ron Dennis who believes that a small part stone oder Kohlefaser) zwischen Bremsscheibe und Felge zum Bruch or carbon between brake.disc and rim to.the break führte. Experte Keke Rosberg (59) findet es absurd: „Soll lead expert Keke Rosberg (59) considers this absurd shall da ein Spatz reingeflogen sein oder was?“¹⁷ there a sparrow in.flown-PPP be-INF or what
 ‘Mercedes is more concerned about the cause of the accident. “The rim has only done 14 kilometres, thus, it was brand new”, team manager Ron Dennis reveals, who believes that a small piece of carbon or a stone came between the brake disc and the rim and caused the break. The expert Keke Rosberg (59) considers this to be absurd: “Does somebody really want to claim that a sparrow flew into it?” ’
- (922) Er behauptete, die Mutter habe das Kind häufig misshandelt. he claimed the mother has the child often abused
 Soll Monja H. ihr eigenes Kind getötet haben? Das glaubt der shall Monja H. her own child kill-PPP have-INF that believes the Staatsanwalt nicht.¹⁸ prosecutor NEG
 ‘He claimed the mother has regularly abused the child. Does he really want to say that she has killed her own child? The prosecutor does not believe this.’

Moreover, reportative *wollen* and *sollen* can be found in *wh*-questions, as is illustrated in examples (923)–(927):

- (923) Wo will Grass eine Tabuisierung von Israel-Kritik entdeckt where wants Grass a taboo of Israel.criticism find-PPP haben? Kein anderes Land wird so viel kritisiert wie Israel.¹⁹ have-INF no other country is so much criticised as Israel
 ‘Where does Grass claim to have found a criticism of Israel? No other country is subject to as much criticism as Israel is.’

¹⁷ DeReKo: HMP08/APR.02557 Hamburger Morgenpost, 29/04/2008.

¹⁸ DeReKo: HMP06/MAR.00369 Hamburger Morgenpost, 03.03. 2006.

¹⁹ DeReKo: RHZ12/MAI.09565 Rhein-Zeitung, 09.05.2012.

- (924) Die Begründung mit der mangelnden „medialen Rezeption“ ist the statement with the lacking medial reception is doch unsinnig. Wer will die gemessen haben?²⁰
PART insane who wants that measure-PPP have-INF
‘The statement about the lacking “medial reception” is insane. Who claims to have measured this?’
- (925) Mobbing-Opfer sollten aufschreiben, wenn sie jemand mobbing.victims should down.write if they somebody verletzt hat. Meist fragt das Gegenüber im Gespräch: „Wann injured has mostly asks the counterpart in.the talk when soll das gewesen sein?“. Dann sind Notizen hilfreich.²¹
shall this be-PPP be-INF then are notices helpful
‘Victims of bullying should write down whenever they have been injured. Mostly, the counterpart will ask: When is it claimed to have happened?/When do you claim it to have happened? In this situation, it is helpful to have notes.’
- (926) Bei einem Freistoß für uns forderte er zweimal die neun at.the a free.kick for us reclaimed he twice the nine Meter Abstand. Wo soll da die Kritik gewesen sein?²²
meters distance where shall there the criticism be-PPP be-INF
‘At a free kick for us, he reclaimed twice a distance of nine meters. What is claimed to be critical about that?/Is there anything that could be considered as criticism?’
- (927) „Man hat Sie gesehen an diesem Montag früh. Zur one has you seen on this Monday morning at.the Tatzeit. Auf dem Kirchplatz.“ Also doch nicht die Willke. time.of.offence on the church.square thus NEG the Willke Katalina Cavic. Aus irgendwelchen Gründen fand sie das Katalina Cavic for some reasons found she that schade. „Und wer soll mich gesehen haben?“ Sie zog die pity and who shall me see-PPP have-INF she raised her Augenbrauen hoch. „Das tut nichts zur Sache“, sagte Köster eyebrow high that does nothing to.the cause said Köster streng.²³
severely
‘“You were seen on Monday morning. At the time of offence. At the church square.” Thus, it wasn’t Willke. Katalina Cavic. For some reason, she was disappointed. “And

20 WDD11/H55.66116: Diskussion: Hiltrud Breyer/Archiv, In: Wikipedia – URL:http://de.wikipedia.org/wiki/Diskussion:Hiltrud_Breyer/Archiv: Wikipedia, 2011.

21 RHZ07/FEB.05994 Rhein-Zeitung, 07.02.2007.

22 NON09/OKT.14910 Niederösterreichische Nachrichten, 26.10.2009.

who is claimed to have seen me?”, she raised her eyebrow. “This doesn’t change anything”, Köster answered severely.’

The behaviour of reportative modal verbs in questions differs from the one of epistemic modal verbs in two essential respects. Firstly, epistemic necessity modals are not compatible with such environments. By contrast, reportative modal verbs are commonly considered as specific types of necessity modal operators. Nevertheless, they are acceptable in all types of information seeking questions.

Secondly, epistemic *kann*, *könnte* and *dürfte* are subject to a context shift, whenever embedded in information seeking questions. The deictic centre is no longer identified with the speaker but, rather, it will be anchored to the addressee. By contrast, reportative modal verbs do not involve such context shift when they occur in information seeking questions. In the case of reportative *wollen*, the deictic centre remains to be identified with the referent of its subject argument, as is illustrated in examples (920) and (923). It is not easy to find an appropriate gloss for these examples, as the interaction of the reportative modal operator and the question operator is a little bit obscure and remains to be investigated in more detail. In general, reportative *wollen* is not very frequently attested in questions.²⁴

The case of *sollen* is a bit different. In canonical declarative clauses, the deictic centre introduced by *sollen* is linked to a salient referent who does not need to be overtly specified. The behaviour of *sollen* does not change in questions: In examples (921)–(922) and (925)–(927), the deictic centre is instantiated by a salient individual that is provided by the context. Of course, one could argue that there are plenty of examples in which the deictic centre of reportative *sollen* tends to be identified with the addressee, as is illustrated in examples (925) or (927). Yet, this is not a particular property of reportative *sollen* in questions. As the deictic centre can be identified with any referent which is contextually supplied, it can also be anchored to the addressee, even in declarative clauses. Summing up, it turns out that reportative modal verbs do not undergo any context shift whenever they are used in questions whereas epistemic modal verbs always will.

The only issue that remains to be settled is why it is so difficult to obtain a precise paraphrase of reportative modal verbs in questions. This could be due to a phenomenon that has been identified by Schenner (2009: 188), who has illustrated that reportative modal verbs that are embedded in complement clauses can yield three different types of interpretations: (i) an assertive interpretation, in

²³ BRZ07/MAR.00092 Braunschweiger Zeitung, 23.03.2007.

²⁴ An investigation based the tagged archive T of the DeReKo carried out on out 26th May 2012 did not yield any results. It was based on the queries *Will /s0 (MORPH(V PCP PERF) sein)* and *Will /s0 (MORPH(V PCP PERF) haben)*.

which the deictic centre is salient from the context and not identical to the attitude holder specified in the matrix clause; (ii) a global one, which is in large parts analogous to the assertive interpretation, but which is restricted to contexts in which the matrix predicate is (implicitly) negated. The reportative modal verb conveys a meaning like ‘as is alleged’. (iii) Finally, there is a concord interpretation, in which the deictic centre of the embedded verb is identified with the attitude holder argument of the matrix predicate. It remains to be checked to what extent the first two interpretations may occur in questions, and to what extent they could resolve the difficulties to find appropriate paraphrases. As questions are negative polarity environments, it is fairly plausible that the reportative instances above involve a global interpretation.

5.1.7 Event related conditional clauses

As was shown in Section 4.17, epistemic modal verbs are hardly compatible with antecedents of event related conditional clauses. The very few examples that come into consideration are characterised by two properties: firstly, they all contain an epistemic instance of the form *könnte* and they appear to be impossible with epistemic necessity modal operators. Secondly, all of the attested examples involve a context shift in which the deictic centre is linked to the addressee, rather than the speaker. This is reminiscent of the behaviour of epistemic modal verbs in questions. And indeed, as has been pointed out above, there are substantial parallels that indicate a close relation between the two clause types.

Turning to reportative modal verbs, they are also attested in event related conditional clauses. Yet, they behave differently from epistemic modal verbs in conditionals in two essential respects. Firstly, they involve a modal necessity operator. Secondly, they do not undergo context shift. They exhibit a similar behaviour as reportative modal verbs in questions, as illustrated in (928) and (929):

- (928) Entsprechend panisch reagieren viele, wenn in der Region ein
 correspondingly panic react many if in the region a
 „Kinderansprecher“ aufgetaucht sein soll.²⁵
 child.accoster appear-PPP be-INF shall

‘In an accordingly panic-fuelled manner, many people react if there is a rumour about a man who accosts children in the region.’

25 DeReKo: RHZ07/OKT.04281 Rhein-Zeitung, 05/10/2007.

- (929) Ein Sicherungsverfahren wird dann durchgeführt, wenn der Angeklagte bei Begehung der Tat schuldunfähig im Sinne von § 20 StGB gewesen sein soll, aber eine isolierte Maßregel der Besserung und Sicherung verhängt werden muss, weil der Täter aufgrund seines Zustandes für die Allgemeinheit gefährlich ist.²⁶
- a protection.action is then out.carried if the accused at commitment the-GEN crime-GEN criminally.incapable in.the sense of § 20 StGB be-PPP be-INF shall but a isolated measure the-GEN amendment-GEN and protection-GEN impose-PPP PASS.AUX-INF must because the culprit due his state for the community dangerous is
- ‘An action of protection is undertaken in the case the culprit is claimed to be criminally incapable in the sense of § 20 StGB during the committing of the crime and if a measure of the amendment and protection has to be imposed because the culprit is dangerous for the community due to his state.’

In a similar vein, Öhlschläger (1989: 236) argues that reportative modal verbs are more readily acceptable in antecedents of conditional clauses than epistemic modal verbs are. Yet, his examples involve echoic antecedents and, thus, cannot be event-related conditionals. Rather, they should be analysed as speech act conditionals, which behave fairly differently in syntactic and semantic respect.

Likewise, a speech act related interpretation is also possible for the examples given above, as the antecedents can alternatively be interpreted in an echoic manner. Nevertheless, there are good reasons to assume that they are event related conditionals. As Eisenberg (2004: 346) has pointed out, there are two types of correlates which can occur in the consequent of conditional clauses: *dann*-correlates and *so*. Whereas the first type is typical of event related or temporal conditionals, the latter is characteristic of epistemic conditionals. A similar observation has been made by Reis and Wöllstein (2010: 143). As the conditional in example (929) involves a consequent clause which contains the correlate *dann*, an event related interpretation appears to be more likely.

At any rate, if the examples above and the ones with epistemic modal verbs discussed in Section 4.17 turn out to involve speech act related conditionals, this does not affect the fact that epistemic modal verbs and reportative modal verbs behave differently with respect to this environment. Whereas epistemic modal verbs in conditional clauses undergo a context shift, reportative modal verbs do not.

²⁶ DeReKo: WPD/PPP.03963 Wikipedia, 2005.

5.1.8 Summary

In this section, it has been shown that reportative modal verbs and epistemic modal verbs differ with respect to the environments from which they are excluded. Generally speaking, reportative modal verbs are more flexible and less restricted. On the one hand, there are environments in which epistemic modal verbs are totally ruled out and in which reportative modal verbs are attested, such as (i) adverbial infinitives, (ii) past participles that are embedded by a past tense auxiliary, (iii) nominalisations and (iv) optatives. On the other hand, there are environments in which reportative modal verbs yield a different interpretation than epistemic modal verbs, such as (v) past tense contexts, (vi) questions and (vii) antecedents of conditional clauses.

Furthermore, it has turned out that reportative *wollen* and *sollen* do not behave in a uniform manner. As it seems, *wollen* is more flexible than *sollen*. This results in the following hierarchy of flexibility:

(930) reportative *wollen* > reportative *sollen* > other epistemic modal verbs

How can the varying behaviour of these verbs be accounted for? Evidently, these differences are due to procedures of how the variable of the deictic centre is instantiated. As far as reportative modal verbs are concerned, the variable of the deictic centre is anchored to an argument referent who is introduced by the modal verb itself: In the case of reportative *wollen*, the deictic centre is linked to the overt subject argument, in the case of reportative *sollen*, it is linked to a covert argument which is contextually identified. As can be seen, this process of identification is subject to further restrictions which could explain why reportative *sollen* is less readily acceptable compared to reportative *wollen*. The saliency of the deictic centre appears to be important at this point. Crucially, the variable is bound in a very local domain.

Turning to epistemic modal verbs, the variable of the deictic centre may be linked to the speaker, to the addressee or to another referent. As can be seen, there are very strict conditions which have to be met in order to identify the deictic centre. In the most canonical case, the variable for the deictic centre introduced by the epistemic modal operator is bound over a large domain. This, in turn, means that the variable remains open for a long time. There are good reasons to assume that there are certain operators, such as circumstantial modal operators and certain tense operators, which do not tolerate free variables of this type in their domain. Accordingly, all verbs that introduce variables which are bound at a local level, such as reportative modal verbs, can occur embedded under such operators. By contrast, verbs that introduce variables that cannot be identified in the

scope of that operator and that are otherwise left open are not acceptable in such contexts.

Apart from the diagnostics discussed here, there are more statements about reportative modal verbs in non-canonical environments. On the one hand, some authors, e.g. Öhlschläger (1989: 236), emphasise the differences between reportative modal verbs and epistemic modal verbs. As he argues, reportative interpretations are more readily acceptable in event-related causal *weil*-clauses and in patterns in which they receive nuclear stress. On the other hand, there are authors, such as Ehrich (2001: 167), who focus on the environments from which reportative modal verbs are excluded, e.g. the scope of negation.

5.2 So-called 'evidentials' *drohen*, *versprechen* and *scheinen*

As was shown in Sections 2.2.11 and 2.2.12, the raising verbs *scheinen*, *dünken*, as well as *drohen*, *versprechen* and *verheißten* differ from the traditional modal verbs in essential respects, regardless of what has been claimed in earlier literature. The empirical data provided in recent studies shows, in particular, that the hypothesis advocated by Askedal, (1997, 1998: 61) and Wurmbrand (2001: 205), according to which these raising verbs constitute a uniform class together with epistemic modal verbs, cannot be maintained.

In the present Section, it will be demonstrated that the raising variants of these verbs differ significantly with respect to the non-canonical environments from which epistemic modal verbs are banned. In particular, these raising verbs are attested in contexts in which epistemic modal verbs have proven to be unacceptable: (i) they can be embedded as past participles under past tense auxiliaries; moreover, (ii) they are frequently attested in antecedents of event related conditionals; finally, (iii) there are contexts in which these raising verbs yield an interpretation which differs from the one of canonical epistemic modal verbs, e. g. in past tense contexts.

In what follows, only the three frequent verbs *scheinen*, *drohen* and *versprechen* will be considered. Thus, the more archaic verbs *dünken* and *verheißten* will be ignored.

5.2.1 Past participles

As was shown in Section 4.2, the use of epistemic modal verbs as past participles is fairly restricted. Basically, such uses can only be found embedded by present tense auxiliaries that are inflected for subjunctive of the past. In canonical present

perfect tense or past perfect tense contexts, epistemic modal verbs cannot occur in German. Likewise, Askedal (1997b: 14), Fagan (2001: 220 Fn. 34) and Wurmbrand (2001: 205) claim that the raising uses of *drohen* and *versprechen* are banned from non-finite environments.

As has been illustrated by Reis (2005: 133, 2007: 38) and Colomo (2011: 260–265), the past participle of the raising pattern of *drohen* is well attested in German. The participle *gedroht* can be found in four different environments: (a) present perfect indicative (cf. 931–933), (b) present perfect subjunctive of the present (cf. 934), (c) past perfect indicative (cf. 935–941), and (d) past perfect subjunctive of the past (cf. 942). By contrast, epistemic modal verbs are only attested in environment (d), which represents the least important context for *gedroht*, which mainly occurs in past perfect contexts.

- (931) Der zweitägige Volksentscheid in Rumänien über eine neue
the two.day referendum in Romania about a new
EU-gemäße Verfassung hat an einer zu geringen Beteiligung zu
EU-conform constitution has at a to small participation to
scheitern gedroht.²⁷
fail-INF threaten-PPP

‘The two-day referendum in Romania about a new EU-conform constitution was about to fail because of the too low participation.’

- (932) Wegen eines Lecks im Schiffsrumpf hat im
due a leak in.the body has in.the
Main-Donau-Kanal an der Schleuse Hilpoltstein
Main.Donau-Channel at the water.gate Hilpoltstein
(Landkreis Roth) ein Tankfrachter zu sinken
administrative.district Roth a tank.ship to sink
gedroht.²⁸
threaten-PPP

‘Due to a leak in the body, a tank ship was about to sink in the Main-Donau-Channel at the water gate Hilpoltstein (administrative district Roth).’

- (933) Die spanischen Erpressungsversuche, die in letzter Minute
the Spanish extortion.attempts REL.PRN in the last
den Beitritt zu verzögern gedroht haben, zeigen,
minute the to procrastinate threaten-PPP have illustrates
wie unfertig diese Union ist.²⁹
how incomplete this Union is

27 DeReKo: RHZ03/OKT.14345 Rhein-Zeitung, 20/10/2003.

28 DeReKo: NUN09/FEB.02429 Nürnberger Nachrichten, 21/02/2009.

'The Spanish attempts to extort which almost happened to delay the entry in the last minute almost illustrate how incomplete this Union is.'

- (934) Die Frau habe mit den Armen gezappelt und
the woman has-SBJV.PRS with the arms fidget-PPP and
umzukippen gedroht.³⁰
to.fall-INF threaten-PPP
'The woman fidgeted with the arms and was about to fall.'
- (935) und so schied ich mit günstigem Wind von dem Ufer, welches
and so departed I with beneficial wind from the shore which
mir lästrygonisch zu werden gedroht hatte.³¹
me laestrygonic to become threaten-PPP hatte
'and so I departed from the shore that was about to become laestrygonic to me, supported by beneficial wind.'
- (936) Dabei hatte das Gewitter am späten Nachmittag die
actually had the thunderstorm on.the late afternoon the
Veranstaltung schon zu vereiteln gedroht.³²
event already to thwart-INF threaten-PPP
'Actually, the thunderstorm in the late afternoon was already about to thwart the event.'
- (937) Am 28. Mai hatten die Hochwasserdämme des an der
on.the 28th May had the flood.dykes the-GEN at the
Ortschaft vorbeifließenden Mains nach heftigen Regenfällen
locality bypassing Main-GEN after strong rainfall
zu brechen gedroht.³³
to burst-INF threaten-PPP
'On 28th of May, the flood dykes of the Main that bypasses the locality were about to burst.'

²⁹ DeReKo: P94/DEZ.42489 Die Presse, 24/12/1994.

³⁰ DeReKo: BRZ08/DEZ.10451 Braunschweiger Zeitung, 19/12/1008.

³¹ DeReKo: GOE/AGI.00000 Goethe: Italienische Reise, [Autobiographie], (Geschr. 1813–1816), In: Goethes Werke, Bd. 11. – München, 1982 [p. 35].

³² DeReKo: R97/JUL.54255 Frankfurter Rundschau, 15/07/1997.

³³ DeReKo: NUN06/SEP.01329 Nürnberger Nachrichten, 12/09/2006.

- (938) Somit endete ein Spiel für die Berner in euphorischem Jubel,
 so ended a game for the Bernese in euphoric exultation
 das zu einem weiteren Ärgernis der noch jungen Saison zu
 that to a further annoyance the-GEN still young saison to
 werden gedroht hatte.³⁴
 become-INF threaten-PPP had

'And so ended the game for the Bernese with euphoric exultation that was about to become another annoyance in this still very young season.'

- (939) Nachdem er unter Martin Andermatt zu versauern gedroht
 after he under Martin Andermatt to shrivel-INF threaten-PPP
 hatte, blühte er zuletzt unter dem neuen Chef Petkovic auf.³⁵
 had blossomed he recently under the new boss Petkovic out

'After he was about to waste away under Martin Andermatt, he recently blossomed under the new boss Petkovic.'

- (940) Direktor Karl-Heinz Waibel erinnerte an die von Raiffeisen
 director Karl-Heinz Waibel reminded at the from.the Raiffeisen
 spontan bereitgestellte 1 Mill. S zur Bewerbung
 spontaneously provided 1 million Shilling to advertisement
 des Frühjahrsskilaufts, nachdem Schnee- und
 the-GEN spring.skiing-GEN after snow and
 Lawinenchaos die Gäste abzuschrecken gedroht
 avalanche.chaos the visitors to.off.frighten-INF threaten-PPP
 hatten.³⁶
 had

'Director Karl-Heinz Waibel reminded everyone of the one million Shilling provided by Raiffeisen for the promotion of the spring skiing project after the snow and avalanche chaos was about to frighten off the visitors.'

- (941) Das Bauvorhaben hatte sogar komplett zu platzen
 the building.project had even completely to fail-INF
 gedroht.³⁷
 threaten-PPP

'The building project was even about to entirely fail.'

³⁴ DeReKo: SOZ07/JUL.04839 Die Südostschweiz, 26/07/2007.

³⁵ DeReKo: SOZ08/OKT.00350 Die Südostschweiz, 02/10/2008.

³⁶ DeReKo: V99/MAI.22846 Vorarlberger Nachrichten, 12/05/1999.

³⁷ DeReKo: NUZ09/SEP.02880 Nürnberger Zeitung, 30/09/2009.

- (942) Die Schließung sei notwendig geworden, weil es
 the closing-down is-SBJV.PRS necessary become-PPP because it
 aggressive, lautstarke und mit Alkohol verbundene Aktivitäten
 aggressive, loud and with alcohol combined activity
 auswärtiger Jugendlicher gegeben habe, die
 from.outside-GEN adolescents-GEN give-PPP have-SBJV.PRS REL.PRN
 aus dem Ruder zu laufen gedroht hätten.³⁸
 out the rule to run-INF threaten-PPP have-SJBV.PST

'Reportedly, the closing down became necessary because of aggressive, loud activities in combination with alcohol caused by adolescents from outside that were about to get out of control otherwise.'

There are a couple of facts that deserve closer attention. Firstly, the great majority of the occurrences involve the past perfect tense. Secondly, the infinitive complement is very often realised by the verb *werden* 'become'. Thirdly, most of the examples which have been found in the corpus study stem from Switzerland, Austria or Southern Germany.

As was shown in Section 2.2.12, the raising pattern of *versprechen* occurs significantly less frequently than the one of *drohen*. Moreover, it is almost restricted to infinitive complements that are realised by *werden*. Yet, there are a few instances of past participle *versprochen* used as a raising verb, as is illustrated in examples (943)–(944). Once again, the preferred configuration is the past perfect tense.

- (943) Was ein sehenswertes Derby der Handball-Landesliga
 what a worth.seeing derby the-GEN hand.ball.regional.league
 zu werden versprochen hatte, verkam in den Augen manches
 to become-INF promise-PPP had became in the eyes some-GEN
 Zeugen zur Lachnummer.³⁹
 witness to.a laughingstock

'What promised to become an exciting derby in the regional league of handball turned into a laughingstock for many witnesses.'

- (944) Was am Samstag noch ein veritables Verkehrschaos zu
 what on Saturday still a true traffic.chaos to
 werden versprochen hatte und als solches auch vermeldet
 become-INF promise-PPP had and as such also announced
 worden war, stellte sich Sonntag und Montag als halb so
 PASS.AUX was put on Sunday and Monday as half so
 schlimm dar.⁴⁰
 bad there

³⁸ DeReKo: BRZ08/FEB.13559 Braunschweiger Zeitung, 26/02/2008.

³⁹ DeReKo: RHZ00/NOV.20239 Rhein-Zeitung, 28/11/2000.

‘What had promised to become a real traffic chaos on Saturday and what was also announced as such, turned out to be not as bad on Sunday and Monday.’

As Reis (2005: 133, 2007: 38) observes, the past participle is possible with the raising verbs *drohen* and *versprechen*, but it is not attested with the raising verb *scheinen*. As she argues, none of the three forms come into consideration: neither the regular form of the past participle *gescheint*, nor the irregular one *geschienen*, nor the IPP pattern *scheinen*.

Even if Reis’ claims are well supported for Contemporary German, it merits closer attention that the raising verb *scheinen* could be used as a past participle in earlier stages of German. As illustrated below, the participle *geschienen* was in use as a raising verb in the 18th and 19th century. This form occurs in different configurations: In perfect tense indicative (cf. 951), in perfect tense embedded under subjunctive of the present (cf. 945), in past perfect tense indicative (cf. 950). Apart from that, Lessing frequently uses *geschienen* with ellipsis of the tense auxiliary (cf. 947–949). Of course, in these examples it is questionable to what extent *geschienen* can still be considered as a genuine past participle.

- (945) Voltaire sagte, Frélon werde in der englischen
 Voltaire said Frélon PASS.AUX.SJBV.PRS in the English
 Urschrift am Ende bestraft; aber so verdient diese Bestrafung
 original at.the end punished but so deserved this punishment
 sei, so habe sie ihm doch dem Hauptinteresse zu
 be-SBJV.PRS so have-SBJV.PRS she him yet the main.interest to
 schaden geschienen; er habe sie also weggelassen.⁴¹
 harm-INF seem-PPP he have-SBJV.PRS she thus omitted
 ‘Voltaire said Frélon was punished in the end in the English original. However, even if this punishment was justified, it seemed to have harmed the main interest. Thus, he omitted it.’

- (946) Seitdem die Neuberin, sub auspiciis Sr. Magnifizenz des
 since the Neuberin sub auspiciis his magnificence the-GEN
 Herrn Prof. Gottscheds, den Harlekin öffentlich von ihrem
 Sir Prof. Gottsched-GEN the harlequin publicly from her
 Theater verbannte, haben alle deutsche Bühnen, denen daran
 theatre banned have all German stages REL.PRN there.on
 gelegen war, regelmäßig zu heißen, dieser Verbannung
 lied was regularly to be.called-INF this ban
 beizutreten geschienen. Ich sage, geschienen; denn im
 to.join-INF seem-PPP I say seemed because in.the

⁴⁰ DeReKo: P92/JAN.00445 Die Presse, 07/01/1992.

⁴¹ Gotthold Ephraim Lessing, *Hamburgische Dramaturgie*, I, p. 96, (1767).

Grunde hatten sie nur das bunte Jäckchen und den Namen
 reason had they only the colourful jacket and the name
 abgeschafft, aber den Narren behalten.⁴²
 abolish-PPP but the fool keep-PPP

'Since the Neuberin sub auspiciis of His Magnificence Sir Prof. Gottsched has publicly banned the harlequin from her theatre, all of the German stages which wanted to be considered as conforming with the rules seemed to have joined this ban. I say 'seemed' because basically they have only abolished the colourful jacket and the name, but they have kept the fool.'

- (947) er muß sich gedulden, bis es der Ausgang lehre,
 he must REFL be.patient-INF until it the outcome teach-SBJV.PRS
 daß er da seiner Königin am getreuesten gewesen
 that he there his Queen at.the faithful-SUP be-PPP
 sei, als er es am wenigsten zu sein geschienen.⁴³
 be-SBJV.PRS when he it at.the least to be-INF seem-PPP
 'He must be patient until it becomes clear that he was most faithful to his Queen when he seemed to be it the least.'

- (948) Bis auf den Augenblick, da er den Antenor ersticht, nimmt
 until of the instant where he the Antenor stabs takes
 er an den Verbrechen seines Herrn auf die entschlossenste
 he at the crimes his-GEN master-GEN at the resolute-SUP
 Weise teil; und wenn er einmal Reue zu empfinden
 manner part and when he once remorse to feel-INF
 geschienen, so hatte er sie doch sogleich wieder
 seem-PPP so had he she yet immediately again
 unterdrückt.⁴⁴
 suppressed
 'Until the moment when he stabs Antenor, he resolutely participates in the crimes of his master and, when he seemed to feel remorse once in a while, he had immediately suppressed it.'

- (949) Wenn wir also die Schönheiten dieser Figur durch und
 if we so the beauties this-GEN figure through and
 durch untersuchen, so werden wir mit Grunde urteilen, daß
 through investigate so will we with reason judge that
 das, was man bisher für unbeschreiblich vortrefflich an ihrem
 this what one up.to.now for indescribably excellent at their

⁴² Gotthold Ephraim Lessing, *Hamburgische Dramaturgie*, I, p. 138, (1768).

⁴³ Gotthold Ephraim Lessing, *Hamburgische Dramaturgie*, II, p.74, (1768).

⁴⁴ Gotthold Ephraim Lessing, *Hamburgische Dramaturgie*, I, p.148, (1767).

allgemeinen Anblicke gehalten, von dem hergerühret hat, was
 general view considered from this arose has what
 ein Fehler in einem Teile derselben zu sein geschienen.⁴⁵
 a mistake in a part the.same-GEN to be-INF seem-PPP

'If we investigate the beauty of this figure thoroughly, we will conclude that what was considered as indescribably excellent arose from that, which seemed to be a flaw in the part of this figure.'

- (950) Schon in den Grundzügen der romantischen Erfindung
 already in the foundations the-GEN romantic-GEN concept
 erkannte ich den Dichter nicht wieder, der bis dahin allen
 recognised I the poet NEG more the until then all
 Dingen eine erheiternde Seite abzusehen gewußt, mit dem
 things a exhilarating side to.off.see-INF know-PPP with the
 Mysticismus des Christentums sich nie befaßt,
 mysticism the-GEN Christianity-GEN REFL never occupy-PPP
 überhaupt zur religiösen Poesie weder Anlage noch Neigung
 even to.the religious poetry neither talent nor affinity
 zu haben geschienen hatte.⁴⁶
 to have-INF seem-PPP had

'Even in the foundations of the romantic concept I could not recognise the poet, who until then managed to see an exhilarating side in all things, who never occupied himself with the mysticism of Christianity and who seemed to have no talent for or affinity to religious poetry.'

- (951) Ich hoffe nicht, daß Fritsche aus seiner sehr knauserigen
 I hope NEG that Fritsche of his very parsimonious
 Oekonomie auch diesen zurückbehalten hat. Hat er das, so habe
 economy also this kept had had he this so have
 ich freilich bisher Unrecht zu haben geschienen⁴⁷
 I of.course so.far wrong to have-INF seem-PPP

'I do not hope that Fritsche kept it due to his parsimonious economy. If he had so, I seemed to have been wrong, of course.'

⁴⁵ Gotthold Ephraim Lessing, *Laokoon: oder über die Grenzen der Malerey und Poesie*, p. 230, (1766).

⁴⁶ Ernst Schulze, *Cäcilie*, I, preface, p. XII (1818).

⁴⁷ Moritz Weinhold, *Achtundvierzig Briefe von Johann Gottlieb Fichte und seinen Verwandten*, p. 19, (1862).

5.2.2 Event related conditional clauses

As was shown in Section 4.17, epistemic modal verbs are subject to restrictions with respect to their acceptability in antecedents of event related conditional clauses. This behaviour is obviously due to the necessity to identify the variable for the deictic centre within a given context. The identification of the free variable underlies a couple of strict conditions. Accordingly, the sentence will be ungrammatical if these conditions are not fulfilled and the variable remains unbound.

In contrast to epistemic modal verbs, the raising verb *drohen* can be used in antecedents of event related conditional clauses without any restrictions, as illustrated in examples (952)–(954) below. In all of these examples, it is possible to substitute the subordinator *wenn* by *falls*. This ensures that the *wenn*-clauses under investigation are really event related conditional clauses, rather than generic temporal clauses.

- (952) Darin wird auch festgehalten, was passiert, wenn die Firma
in.this is also recorded what happens if the company
ihre Ziele nicht erreicht oder das Unternehmen sogar zu scheitern
her goals NEG reaches or the company even to fail-INF
droht.⁴⁸
threatens

'In this document, it is also specified what will happen if the company does not accomplish its goals or if the company showed indications of failing.'

- (953) Unterstützung erhielt der Nachwuchs von erfahrenen
support got the offspring by experienced
Feuerwehrmännern, aber nur dann, wenn etwas schief zu
fire.men but only then if something bad to
laufen drohte, wie etwa bei der Fahrzeugtechnik.⁴⁹
go-INF threatened as for.instance at the automotive.engineering

'The offspring was supported by experienced fire men only if something showed indications of turning bad, as, for instance, regarding the automotive engineering.'

- (954) Wenn jemand plötzlich im Wasser Probleme bekommt und
if somebody suddenly in.the water problems gets and
zu ertrinken droht, kommen sie und helfen.⁵⁰
to drown-INF threatens come they and help

'If somebody runs into problems while being in the water and threatened with drowning, they will come and help.'

48 DeReKo: M07/OKT.05535 Mannheimer Morgen, 24/10/2007.

49 DeReKo: RHZ06/OKT.28361 Rhein-Zeitung, 30/10/2006.

50 DeReKo: BRZ09/OKT.08437 Braunschweiger Zeitung, 19/10/2009.

Moreover, the raising verb *drohen* abundantly occurs in generic temporal *wenn*-clause, which is another environment that is hardly compatible with epistemic modal verbs.

Likewise, raising patterns of *versprechen* are attested in the antecedent of event related conditionals. Again, the conjunction *wenn* can neatly be replaced with *falls*, which clearly indicates that the examples below are really event related conditional clauses, rather than generic temporal *wenn*-clauses.

- (955) Man werde nur dann zukaufen, wenn dies profitabel zu
one will-SBJV.PRS only then back.buy if this lucrative to
werden verspreche.⁵¹
become-INF promise-SBJV.PRS

‘As is said, they will only buy it back if this business promises to be lucrative.’

- (956) Wo man singt, da lass Dich nieder, sagt ein Sprichwort, und
where one sings there let you down says a saying and
diesem folgt denn auch jung und alt gerne; zumal
this follows then also young and old willingly especially
dann, wenn die Nächte sommerlich warm zu werden
then when the nights summerly warm to become-
versprechen.⁵²
promise

‘As the saying goes, “where they sing, there you shall settle down” which old and young people obey willingly, specially if the nights promise to become summerly warm.’

Finally, the raising patterns of *scheinen* can also be found in antecedents of event related conditional clauses, as is exemplified in examples (957)–(958).

- (957) Wenn er Fähigkeiten zu haben scheint, die man sich nicht
if he abilities to have seems REL.PRN one REFL NEG
erklären kann, dann nennen wir ihn einen Zauberer oder
explain can then call we him a sorcerer or
Magier.⁵³
magician

‘If he seems to have abilities that cannot be explained, we call him a sorcerer or magician.’

51 DeReKo: HAZ08/MAR.02647 Hannoversche Allgemeine, 13/03/2008.

52 DeReKo: A98/JUN.36812 St. Galler Tagblatt, 04/06/1998.

53 DeReKo: BRZ07/NOV.01811 Braunschweiger Zeitung, 15/11/2007.

- (958) Wenn es einem aber vor allem darum zu gehen scheint,
 if it one yet above all about.that to go-INF seem
 fragwürdige Entscheidungen der SPD-Landesregierung
 questionable decisions the-GEN SPD.regional.government
 zu rechtfertigen, dann schreibt man in seinem Leserbrief
 to justify then writes one in his letter.to.the.editor
 natürlich etwas anderes.⁵⁴
 of.course something else

'If it appears to be only about justifying questionable decisions made by the regional government led by the SPD, then you will write something else in your letter to the editor.'

Aside from event related conditional clauses, the three raising verbs *drohen*, *versprechen* and *scheinen* are also abundantly recorded in generic temporal *wenn*-clauses, which is another related environment from which epistemic modal verbs are excluded. These facts clearly indicate that these raising verbs significantly differ from epistemic modal verbs.

At this point the question arises why these raising verbs are acceptable in event related conditional clauses whereas epistemic modal verbs are not. As was illustrated above, epistemic modal verbs introduce a variable for the deictic centre which has to be anchored to an appropriate attitude holder. This process of identification underlies strict conditions. If these conditions are not fulfilled, the variable remains unbound and the linguistic structure cannot be interpreted. As was shown, the antecedents of event related conditional clauses are environments in which these conditions are difficult to meet for epistemic modal verbs. Evidently, *drohen*, *versprechen* and *scheinen* differ with respect to the nature of the deictic centre and how it is identified.

Turning to *drohen* and *versprechen*, Reis (2005: 140, 2007: 18) has pointed out a whole range of essential analogies which they share with aspectual verbs. Accordingly, she suggests considering the two raising verbs as aspectual verbs. In Section 2.2.12, more arguments in favour of this type of analysis have been presented. If *drohen* and *versprechen* are considered as aspectual verbs, the necessity to assume a deictic centre decreases. Assuming that these lack such a deictic centre, there is no variable which needs to be bound and, correspondingly, they are not subject to the conditions of variable binding.

As far as *scheinen* is concerned, the situation is different. As was demonstrated in Section 2.2.11, *scheinen* can optionally realise its deictic centre as a dative NP. Accordingly, it is plausible to assume that the deictic centre is always

⁵⁴ DeReKo: RHZ09/OKT.09156 Rhein-Zeitung, 10/10/2009.

represented as an argument of the raising verb, even if it is not overtly realised. As can be seen, this argument position is usually filled with a generic pronoun, which refers to a contextually given group of persons or the totality of all human beings. Apart from that, any analysis which treats *scheinen* as an epistemic modal verb ignores one important detail: It can alternatively select hypothetical comparative clause. Thus, it appears to be more appropriate to consider *scheinen* as a verb that compares two state of affairs. The one which the speaker is considering, and the one to which it resembles. In other words: the state of affairs under consideration exhibits the same characteristics as the characteristics of the state of affairs expressed by the embedded proposition.

5.2.3 Past tense

As was observed by Reis (2005: 129, 2007: 13) and Colomo (2011: 241–245), the raising pattern of *drohen* and *versprechen* behave in a very different manner compared to epistemic modal verbs when they are inflected for the past tense. As Reis argues, the past tense of the raising verb *drohen* does not convey ‘a report of speaker inferences on the basis of present knowledge but an objective report of a past event’. This indicates that *drohen* and *versprechen* are not evaluated to the same extent with respect to the speaker’s knowledge as epistemic modal verbs are.

In a similar manner, *scheinen* is attested in past tense context in which it does not undergo a context shift which is typical of epistemic modal verbs in such environments, as demonstrated at length in Section 4.3.

(959) Mozart schien das Leben in Italien zu genießen.⁵⁵
 Mozart seem-PST the life in Italy to enjoy-INF
 ‘Mozart seemed to enjoy his life in Italy.’

(960) Mozart [...] schien sich in Mailand so wohl zu fühlen, daß er
 Mozart seem-PST REFL in Milan so well to feel-INF that he
 seiner Schwester mitteilte, daß er ‘keine lust mehr auf
 his sister told that he no desire anymore on
 salzburg habe’.⁵⁶
 Salzburg have-SBJV.PRS
 ‘Mozart seemed to feel so well in Milan that he told his sister that he did not feel like
 going back to Salzburg.’

55 Kurt Palm, *Der Mozart ist fett und wohlauf*, Wien: Löcker, p. 66, (2005).

56 Kurt Palm, *Der Mozart ist fett und wohlauf*, Wien: Löcker, p. 111, (2005).

- (961) Allerdings schien Mozarts Vater auch vom neuen Plan
 however seem-PST Mozart-GEN father also by.the new plan
 nicht wirklich überzeugt zu sein.⁵⁷
 NEG truly convince-PPP to be-INF
 'However, Mozart's father did not seem to be very convinced about the new plan.'
- (962) Berufliche Angelegenheiten schienen den Vater in dieser
 professional affairs seem-PST the father in this
 Situation freilich nicht zu interessieren.⁵⁸
 situation of.course NEG to interest-INF
 'Of course, the father did not seem to be interested in business matters in this situation.'
- (963) Je länger Leopolds Aufenthalt in Wien dauerte, desto mehr
 the longer Leopold-GEN stay in Vienna lasted the more
 Gefallen schien er an diesem Leben zu finden.⁵⁹
 pleasure seem-PST he an that live to find-INF
 'The longer Leopold's stay in Vienna continued, the more he seemed to like this sort of life.'

The examples in (959)–(963) are particularly revealing regarding the nature of the evaluation at work in the case of *scheinen* because they involve an author who talks about a period in which he did not live yet. Accordingly, the past tense form *schien* in example (959) does not reflect an assumption of the author which has been made when Mozart was in Italy. As a consequence, it does not yield a past speech act event reading or a reported indirect speech interpretation, which is the natural interpretation for epistemic modal verbs in this context.

Alternatively, one could assume that *schien* reflects an assumption of Mozart's contemporaries. But this type of interpretation is not the adequate one either. At this point, the question arises what the precise contribution of the past tense marker is in these contexts. It appears to be similar to the past event reading, an assumption made by the speaker at the Time of Utterance based on some evidence from the past. It is not clear what this type of analysis can look like in more detail.

Based on the hypothesis that *scheinen* is a verb which compares two states of affairs, an attractive solution can be found. If the main contribution of *scheinen* is the expression of a comparison between two states of affairs, it is expected that the past tense operator will indicate that one of the two states of affairs ceased to exist. Accordingly, example (959) could be rephrased in the following way: 'There

⁵⁷ Kurt Palm, *Der Mozart ist fett und wohlauf*, Wien: Löcker, p. 118, (2005).

⁵⁸ Kurt Palm, *Der Mozart ist fett und wohlauf*, Wien: Löcker, p. 218, (2005).

⁵⁹ Kurt Palm, *Der Mozart ist fett und wohlauf*, Wien: Löcker, p. 274, (2005).

was a state of affairs which was similar to the hypothetical state of affairs in which Mozart liked life in Italy'. Moreover, the referent who can perceive the comparison can optionally be encoded by a dative NP.

In German, it is possible to use *scheinen* with respect to past events or states in two different ways. The past can be expressed as a past tense morpheme on the verb *scheinen*, as is illustrated above. Moreover, the infinitive complement can be realised as a perfect tense infinitive, as illustrated below. Although the meanings of these two alternatives seem to overlap, they are by no means synonymous. As demonstrated in example (965), there are even contexts in which the past tense form *schien* cannot be substituted with a present tense form *scheint*, which embeds a perfect tense infinitive. Interestingly, a replacement is significantly more acceptable with epistemic modal verbs which are evaluated at the Time of Utterance (cf. 966–968):

- (964) Mozart *scheint* das Leben in Italien *genossen zu haben*.
Mozart seem the live in Italy enjoy-PPP to have-INF
'Mozart seems to have enjoyed the life in Italy.'
- (965) # Je länger Leopolds Aufenthalt in Wien dauerte, desto mehr
the longer Leopold-GEN stay in Vienna lasted the more
Gefallen *scheint* er an diesem Leben gefunden zu haben.
pleasure seem he an that live find-PPP to have-INF
'The longer Leopold's stay continued, the more he seemed to like this sort of life.'
- (966) Je länger Leopolds Aufenthalt in Wien dauerte, desto mehr
the longer Leopold-GEN stay in Vienna lasted the more
Gefallen *dürfte* er an diesem Leben gefunden haben.
pleasure might he an that live find-PPP have-INF
'The longer Leopold's stay continued, the more he seemed to have liked this sort of life.'
- (967) Je länger Leopolds Aufenthalt in Wien dauerte, desto mehr
the longer Leopold-GEN stay in Vienna lasted the more
Gefallen *könnte* er an diesem Leben gefunden haben.
pleasure could he an that live find-PPP have-INF
'The longer Leopold's stay continued, the more he could have liked this sort of life.'
- (968) ? Je länger Leopolds Aufenthalt in Wien dauerte, desto mehr
the longer Leopold-GEN stay in Vienna lasted the more
Gefallen *muss* er an diesem Leben gefunden haben.
pleasure must he an that live find-PPP have-INF
'The longer Leopold's stay continued, the more he must have liked this sort of life.'

These contrasts follow naturally if *scheinen* is analysed as a verb that establishes a comparison between a given state of affairs and a hypothetical state of affairs.

5.2.4 Summary

As this section has briefly demonstrated, the raising verbs *scheinen*, *drohen* and *versprechen* behave differently from epistemic modal verbs. There are a couple of environments in which they occur and in which epistemic modal verbs are categorically ruled out, e.g. past participles which are embedded by indicative perfect tense auxiliaries and event related conditional clauses. Aside from that, there are environments in which these raising verbs yield interpretations in which they differ from genuine epistemic modal verbs, such as in past tense contexts.

From this it follows that *drohen*, *versprechen* and *scheinen* cannot be analysed as epistemic modal verbs, as claimed by Askedal (1997: 14, 1998: 61) and Wurmbrand (2001: 205). Alternatively, there are good arguments to treat *drohen* and *versprechen* as aspectual verbs, as has been suggested by Reis (2005: 140, 2007: 18). By contrast, *scheinen* is most efficiently captured as a verb that establishes a comparison between a given state of affairs and a hypothetical state of affairs. The referents who can perceive this comparison can optionally be realised as a dative NP. As a consequence, *scheinen*, *drohen* and *versprechen* will not receive any further consideration in the upcoming sections.

6 Anchoring the deictic centre

In the preceding sections, it was shown that epistemic modal verbs are excluded from a whole range of environments: (i) they do not occur with verbless directional phrase complements, (ii) they cannot be separated from their infinitive complements in *wh*-clefts, (iii) they do not undergo nominalisation, (iv) they are banned from adverbial infinitives, and finally, they cannot be embedded under (v) circumstantial modal verbs, (vi) predicates of desire, (vii) imperative operators, or (viii) optative operators. By contrast, reportative modal verbs are attested in some of these environments: in nominalisations (iii), in adverbial infinitives (iv), embedded under tense auxiliaries (v), and optative operators (viii).

Moreover, it was demonstrated that there are environments in which epistemic modal verbs and reportative modal verbs obtain different interpretations. In most of these environments, reportative modal verbs do not undergo context shift, e.g. in past tense contexts, in questions and in antecedents of event related conditionals.

The aim of this chapter is to provide an explanation for the following observations.

1. Why are epistemic modal verbs excluded from these environments?
2. Why are reportative modal verbs nevertheless possible in certain of these environments?
3. Why do the two types of modal verbs differ in their interpretations in certain contexts?
4. Why do reportative *wollen* and reportative *sollen* have different preferences for these environments?

As it turns out, epistemic and reportative modal verbs can be characterised as operators which introduce a variable for the deictic centre. In order to apply the Condition for Deictic Centres (CoDeC), this variable needs to be instantiated. This operation of identification needs to fulfil certain anchoring conditions. If these conditions are not met, the variable remains unbound. As can be seen, there are particular contexts that do not tolerate an unbound variable of the deictic centre.

6.1 The speaker, the addressee and arguments

Obviously, epistemic modal verbs are evaluated with respect to a certain attitude holder. In the most frequent case, this is the speaker. Yet, there are contexts in which the epistemic modal verb is evaluated with respect to a referent other than

<https://doi.org/10.1515/9783110411027-006>

the speaker. Accordingly, the epistemic operator must be some sort of variable which identifies the attitude holder who makes a commitment to a certain believe.

6.1.1 Declarative speech acts

In their most frequent use, epistemic modal verbs are part of a declarative speech act. There is a broad consensus that the epistemic modal verb is evaluated with respect to the speaker's knowledge in these configurations.

- (969) So kann die Motte in Wipshausen einmal ausgesehen haben.¹
 so can the Motte in Wipshausen once out.look-INF have-INF
 'The Motte in Wipshausen may once have looked like this.'
- (970) Die Kleidungsstücke deuten dann auch darauf hin, dass es sich
 the clothes indicate then also to.it at that it REFL
 um einen Mann gehandelt haben müsste.²
 about a man deal-PPP have-INF must-SBJV.PST
 'The clothes indicate that it must have been a man.'
- (971) Der Wunsch nach Ungestörtheit dürfte schließlich dem Liebespaar
 the wish for privacy might finally the love.couple
 auf so tragische Weise das Leben gekostet haben.³
 for such tragic manner the live cost-PPP have-INF
 'The wish for privacy might have finally caused the death of the lovers, who died in such a tragic manner.'

In all of the representative examples given above, the attitude holder who makes the epistemic assumption is identified with the speaker. Thus, the speaker indicates that the embedded proposition is not part of his own knowledge.

6.1.2 Interrogative speech acts

Much more rarely, there are epistemic modal verbs that occur in information seeking questions. As was illustrated in great detail in Sections 4.11 and 4.12, the epistemic modal is not evaluated with respect to the speaker. Rather, the attitude holder who carries the belief is identified with the addressee.

¹ DeReKo: BRZ09/AUG.04565 Braunschweiger Zeitung, 11/08/2009.

² DeReKo: RHZ09/JUN.24827 Rhein-Zeitung, 29/06/2009.

³ DeReKo: NON09/JAN.04467 Niederösterreichische Nachrichten, 12/01/2009.

- (972) a. MOPO: Wer könnte die Fälschung der Wahl veranlasst
 who could the fraud the-GEN election arranged
 haben?
 have
- b. Steinbach: Nur einer: Revolutionsführer Ajatollah Ali
 only one revolution.leader Ajatollah Ali
 Chamenei.⁴
 Chamenei
 ‘Who could have arranged the fraudulent elections?’
 Only one, the leader of the revolution Ajatollah Ali Chamenei.’

A speaker who uses an epistemic modal verb in an information seeking question indicates that he does not expect the addressee to have enough knowledge to commit himself to a precise answer. Rather, the speaker asks the addressee about his assumptions. Accordingly, the speaker does not attribute the embedded proposition to the addressee’s knowledge. It was illustrated in Sections 4.11 and 4.12 that question operators are operators that induce a general type of context shift in which the addressee becomes the most salient referent.

6.1.3 Complement clauses

As was shown in Section 4.15, the epistemic modal verb is not evaluated with respect to the speaker. Based on the observations made by Lasersohn (2005: 277), Stephenson (2007: 489) argues that an embedded epistemic modal verb is always evaluated with respect to an attitude holder argument of the immediately superordinate predicate. Likewise, Zimmermann (2004: 265) argues that related epistemic modifiers such as the discourse particle *wohl* may never take scope out of a complement clause.

- (973) Und er erzählt, dass dieses Rätsel bald gelöst sein könnte.⁵
 And he tells that this riddle soon solv-PPP be-INF could
 ‘And he said that this riddle could be solved soon.’
- (974) Polizeisprecher Thomas Figge erklärte gestern auf Anfrage,
 police.spokesman Thomas Figge declared yesterday on demand
 dass der 33-Jährige mindestens Tempo 100 gefahren sein muss.⁶
 that the 33.year.old at.least tempo 100 drive-PPP be-INF must

⁴ DeReKo: HMP09/JUN.01442 Hamburger Morgenpost, 17/06/2009.

⁵ DeReKo: NUN03/AUG.02519 Nürnberger Nachrichten, 28/08/2003.

‘The police spokesman Thomas Figge declared yesterday, on demand, that the 33-year-old must have driven at least 100 km/h.’

In both examples, the epistemic modal verb is embedded under a predicate which involves a subject referent that can be interpreted as an attitude holder. Accordingly, the variable of the deictic centre provided by the epistemic modal verb is anchored to the subject referent *er* ‘he’ in example (973), and to the subject referent ‘police spokesman Thomas Figge’ in example (974). In the examples above, the speaker signals that he does not attribute the embedded proposition to the knowledge of the respective subject referents.

6.1.4 Reportative modal verbs

As was demonstrated in Sections 2.2.3.7 and 2.2.6.4, reportative modal verbs attribute a claim to one of their arguments. In the case of *wollen*, the claim is associated with the subject argument referent (975) and, in the case of *sollen*, the claim is associated with a covert argument which is contextually identified (976).

- (975) Badhapur ist ein Sadhu, ein Weiser, Gerechter. 106 Jahre will die
Badhapur is a Sadhu, a sage righteous 106 years wants the
hagere Gestalt mit dem langen grauen Haar schon alt sein.⁷
rawboned figure with the long grey hair already old be-INF
‘Badhapur is a Sadhu, a wise man, a religious man. This haggard form with long grey
hair claims to be as many as 106 years old.’
- (976) Tom Cruise und Katie Holmes sind geschockt. L. R. Hubbard (kl.
Tom Cruise and Katie Holmes are shocked L R Hubbard small
F.) soll Suris Vater sein.⁸
picture shall Suri-GEN father be-INF
‘Tom Cruise and Katie Holmes are shocked. L. R. Hubbard is claimed to be Suri’s
father.’

In the examples above, there appear to be two referents that come into consideration as the deictic centre: Firstly, the deictic centre could be the speaker. Secondly, the deictic centre could be the attitude holder argument of *wollen* and *sollen*. As will be demonstrated in the next section, there are good reasons to adopt the latter point of view. According to this approach, the speaker indicates that he has

⁶ DeReKo: BRZ09/MAI.05146 Braunschweiger Zeitung, 12/05/2009.

⁷ DeReKo: NUN99/OKT.02110 Nürnberger Nachrichten, 23/10/1999.

⁸ DeReKo: HMP08/JAN.00616 Hamburger Morgenpost, 08/01/2008.

no evidence whether the embedded proposition is really part of the verified knowledge of the experiencer argument. In example (975), he would convey that he does not know whether the proposition *Sadhu is 106 year old* is really part of Sadhu's verified knowledge. Alternatively, it could be a false belief or Sadhu could be lying. In neither of the two cases would the speaker consider the proposition as Sadhu's knowledge. In example (976), the speaker signals that he has no reason to assume that the proposition *L. R. Hubbard is Suri's father* is really part of the covert argument referent's knowledge. This will be shown in great detail in Section 6.2.2.

6.1.5 Summary

In this section, it was demonstrated that epistemic modal operators are not always evaluated with respect to the speaker. There are particular contexts and configurations in which the operator is interpreted with respect to other referents: In information seeking questions, the relevant referent is the addressee; in embedded context, the epistemic agent is realised as an attitude holder argument of the superordinate clause. Finally, the operator is evaluated with respect to an argument of the modal verb in the case of reportative modal verbs. These facts reveal the nature of the syntactic and semantic representation of that attitude holder. As it can refer to different referents, it has to be some sort of variable. In what follows, this variable will be referred to as the 'deictic centre'. The following sections are dedicated to the conditions governing the instantiation of that variable.

6.2 The deictic centre

As was illustrated above, epistemic modal operators introduce a variable with respect to which they need to be evaluated. A similar concept was introduced by Charles Fillmore (in the reprinted version: Fillmore (1997: 98)) in his *Lectures on Deixis*, in the early seventies, in which he discusses the *deictic centre* for the first time. Subsequently, it was developed in more detail by Levinson (1983: 64). A similar notion has already been developed by Bühler (1934: 102), who refers to it as *Origo*. Abraham (2011: xxxv) illustrates that the notion of *Origo* is a potential means for the description of epistemic modality. Even if the deictic centre is a concept that affects a lot of linguistic elements, this section will uniquely be addressed to its role for epistemic modal operators.

There are further reasons that make it plausible to assume that epistemic modal verbs introduce a variable for the deictic centre. Firstly, there is an independent need to assume that any modal operator specifies a modal source. As

will be shown in Section 6.2.1, this modal source is identical to the deictic centre in the case of epistemic modal verbs. Secondly, it was illustrated throughout this study that epistemic modal verbs are characterised as operators that are evaluated with respect to someone's knowledge. In particular, their use indicates that the speaker does not know whether the embedded proposition really holds. How this can be formulated in more precise terms will be pointed out in Section 6.2.2.

6.2.1 The modal source

Necessities and possibilities are often considered as abstract forces. Accordingly, the modal source is the source of these forces. As for circumstantial modal verbs, this modal source is typically instantiated by the individual who imposes the obligation in the case of *müssen* 'must', who grants the permission in the case of *dürfen*, and to whom the volition is attributed in the case of *wollen* and *sollen*. An influential description of the modal source was provided by Bech (1949: 4). He argues that, sometimes, the modal source is already specified in the lexicon entry. As Bech (1949: 37) exemplifies, *wollen* and *sollen* need to be analysed as necessity modal verbs. Accordingly, *wollen* and *sollen* can be considered as necessity modal verbs which specify their modal source as [+internal]. In contrast, there are other necessity modal verbs such as *müssen* which remain underspecified with respect to the modal source. Diewald (1999: 102) has shown that the modal source is always realised by the speaker in the case of epistemic modal verbs. In other words, the speaker is the referent who judges the embedded proposition with respect to its validity and who makes a commitment to the truth. In contrast, the discourse referent who makes the commitment to the truth in the case of reportative modal verbs is the referent encoded by the experiencer argument, as was observed Diewald (1999: 225).

Interestingly, the modal source has not received much attention in the most popular approaches in formal semantics such as Kratzer (1981), Kratzer (1991), Brennan (1993) or Hacquard (2006). In one of the most prominent approaches on modality, Kratzer (1991: 649) assumes modal operators involve three relevant dimensions of modality: the modal force, the modal base and the ordering source. Yet, the modal source does not appear to play any crucial role in this account.

But in the past decades, there has been a growing number of studies which have illustrated the necessity of the concept modal source. In his formal semantic analysis, Westmoreland (1998: 74) illustrates that an epistemic operator always has to be evaluated with respect to a given person. Likewise, Abraham (2005: 263) argues that both circumstantial and epistemic modal verbs involve a modal source which is represented as a covert argument of the modal verb. In a similar fashion,

Depraetere and Verhulst (2008: 3) demonstrates that each type of necessity has its source of modality, including epistemic necessities. Furthermore, Lasersohn (2005) indicates that predicates of personal taste have to be evaluated with respect to a judge, which is most typically instantiated by the speaker. Extending his analysis to epistemic modal verbs, Stephenson (2007: 497) shows that epistemic modal verbs also have to be evaluated with respect to some judge.

6.2.2 The Condition on Deictic Centres

Throughout this study, it was shown that the most efficient way to characterise epistemic modality is in terms of knowledge. A speaker who employs an epistemic modal verb indicates that he does not know whether the embedded proposition is true. This condition was referred to as the *Condition on Deictic Centres (CoDeC)*. The next section is dedicated to the question of how it can be formulated in a precise way. The section after that will illustrate how the CoDeC can be applied to reportative modal verbs.

6.2.2.1 Which propositions are not part of the knowledge?

In principle, there are three ways to formulate the CoDeC. The open question is which propositions exactly are not part of the deictic centre's knowledge. Is it only the positive proposition (977a)? Or is it rather the negated proposition (977b)? Or is it the conjunction of them which has to be excluded from the deictic centre's knowledge (977c)?

(977) Three ways to formulate the CoDeC:

- a. p is not part of the deictic centre's knowledge
- b. $\neg p$ is not part of the deictic centre's knowledge
- c. neither p nor $\neg p$ part of the deictic centre's knowledge

As can be seen, there are advocates for each of the three positions. As most of the authors are not very explicit about this matter, it is not always clear whether the classifications given below really reflect their intentions. Nevertheless, they can roughly be associated with one of the three options. The first position, according to which the positive proposition only is excluded, (977a) appears to be defended by Krämer (2005: 60, 133) and Ziegeler (2006: 90). A compatible account was suggested by Diewald (1999: 207), who claims that, in the case of epistemic modal verbs, the deictic centre values the embedded proposition as $[\pm \text{non-factive}]$. In a less explicit way, Erb (2001: 161), Fintel and Gillies (2010: 353), Kratzer (2011, 2012: 99) argue for a fairly similar analysis based on the concept of direct evidence rather

than knowledge. The second position, according to which the negated proposition only is excluded, (977b) is explicitly advocated by Martin (2011: Sect. 3.1.), who claims that a speaker who employs an epistemic modal verb ‘is not sure in EVAL-T that P is false’. Finally, the third position, according to which both propositions are excluded (977c), appears to be entertained by Westmoreland (1998: 12), though he does not make any explicit claim about this matter.

As there are configurations in which the speaker knows the embedded proposition to be false, the alternatives (977b) and (977c) are less plausible. It was shown in great detail in Sections 2.2.1.5, 2.2.2.5, 2.2.6.5 and 4.4 that epistemic modal verbs can be combined with false proposition if they are inflected for the subjunctive of the past. In particular, this affects the three forms *könnte*, *müsste* and *sollte*. A representative example is given below (cf. 978):

- (978) Wenn alle Meldungen über Schwangerschaften der
 if all reports about pregnancies the-GEN
 Oscar-Preisträgerin gestimmt hätten, müsste sie
 oscar-winner attune-PPP have-SBJV.PST must-SBJV.PST she
 mittlerweile 30 Babys bekommen haben. Kidman ist Mutter
 meanwhile 30 babies get-PPP have-INF. Kidman is mother
 zweier adoptierter Kinder.⁹
 two-GEN adopted-GEN children

‘If all of those reports about the Oscar winner’s pregnancies had been true, then she would have had 30 babies by now. Kidman is the mother of two adopted children.’

As this instance clearly shows, the author of that utterance knows that Nicole Kidman does not have 30 children. Of course, one could argue that this peculiar behaviour is the effect of the subjunctive of the past form. But an appropriate analysis remains to be developed.

The second position, according to which only the negated proposition is excluded, (977b) is the least plausible one. Apart from the difficulties just mentioned, it cannot account for the fact that an epistemic modal verb hardly ever embeds a proposition which is known to be true. The first option has the great advantage of capturing subjunctive of the past modals as well without any further stipulations. And as will be shown in the following sections, it is able to capture the behaviour of reportative modal verbs as well.

At this point, it is possible to formulate the *Condition for Deictic Centres* as follows:

- (979) Condition on Deictic Centres (CoDeC)

⁹ DeReKo: BRZ07/DEZ.11819 Braunschweiger Zeitung, 31/12/2007.

The use of an epistemic operator indicates that the embedded proposition is not part of the deictic centre's knowledge.

This conditions neatly captures the behaviour of epistemic modal verbs in declarative clauses, in questions and in embedded complement clauses. In the following section, it will be demonstrated that it is also capable of accounting for the behaviour of reportative modal verbs.

6.2.2.2 The deictic centre in reportative modal verbs

As was indicated above, reportative modal verbs crucially differ from epistemic modal verbs with respect to the deictic centre because they involve two different potential candidates which come into consideration for the deictic centre: the speaker and the referent encoded by the experiencer argument provided by the reportative modal verb.

By means of the diagnostics presented in the previous section, it will become more evident which of the two candidates acts as the deictic centre for reportative modal verbs. Once again, the relevant aspect concerns the knowledge of the referents. Granted that the CoDeC as is formulated above holds, two hypotheses will be examined: (i) the use of a reportative modal verb implies that *p* is not part of the speaker's knowledge, and (ii) the use of a reportative modal verb implies that *p* is not part of the experiencer's knowledge. Hypothesis (i) is refuted in case reportative modal verbs occur in contexts in which *p* is part of the speaker's knowledge, hypothesis (ii) is refuted in case reportative modal verbs occur in contexts in which *p* is part of the knowledge attributed to the referent encoded by the experiencer argument.

First of all, Ehrich (2001: 157), Colomo (2011: 241), Faller (2011: 4) and Faller (2012: 289) have pointed out that reportative modal verbs can embed propositions which the speaker knows to be false. Such configurations are attested in corpora, as is illustrated in examples (980)–(982). In this respect, reportative modal verbs differ from epistemic modal verbs that are inflected for the indicative.

- (980) Die Familie des angeblichen Verlobten weiß nichts von
 the family the-GEN alleged fiancé knows nothing about
 einer Tania Head. Die Bank Merrill Lynch, bei der sie
 a Tania Head the bank Merrill Lynch at REL.PRN she
 gearbeitet haben will, hatte sie nie auf der Gehaltsliste.¹⁰
 work-PPP have-INF wants had her never on the payroll

‘The family of her alleged fiancé has never heard about Tania Head. At Merrill Lynch, where she claims to have worked, she was never on the payroll.’

- (981) Es war nicht korrekt, diesen Druck auf den angeklagten
 it was NEG correct that pressure on the accused
 Kindermörder auszuüben. Aber dass sich dieser Strolch vor dem
 child.murderer to.exert-INF but that REFL that thug of the
 Polizei-Vize-Chef „gefürchtet“ haben soll, ist Schauspielerei.¹¹
 police-vice-boss afraid.be-PPP have-INF shall is comedy
 ‘It was not correct to exert pressure on the accused child murderer. But he is a
 comedian if the thug claims to have been “afraid” of the vice-boss of the police.’
- (982) bei mir in der Firma soll angeblich ein Paket bei mir
 at my in the company shall reportedly a parcel at me
 abgegeben worden sein.... Stimmt nicht. Ich habe das Paket
 deliver-PPP PASS.AUX-PPP be-INF holds NEG I have the parcel
 nie gesehen.¹²
 never seen
 ‘Reportedly, a parcel was delivered to me at my company Not true. I have never
 seen the parcel.’

These instances reflect situations in which the speaker knows the embedded proposition to be false and in which the knowledge of the referent expressed by the experiencer argument is left unspecified. This referent could know the embedded proposition to be false, thus he would be lying. Alternatively, he could also have a false belief and be convinced that the embedded proposition is true. As a consequence, the effect of the reportative modal verb is to label the commitment of that referent as unreliable. In a similar manner, Diewald (1999: 228) suggests that reportative *wollen* occurs even more often in environments in which the speaker raises doubts about the validity of the embedded proposition. An analogous reasoning is advocated by Öhlschläger (1989: 235). Even if examples (980)–(982) are in slight favour of hypothesis (ii), according to which the relevant knowledge is the one associated with the experiencer argument, they do not refute hypothesis (i).

Hypothesis (i) is only refuted if there are contexts in which the embedded proposition is really part of the speaker’s knowledge. As illustrated by the discourse

¹⁰ As quoted in Colomo (2011: 241): DeReKo: HAZ07/OKT.00069 Hannoversche Allgemeine, 01/10/2007.

¹¹ As quoted in Colomo (2011: 241): DeReKo: RHZ04/DEZ.17444 Rhein-Zeitung, 18/12/2004.

¹² As quoted in Faller (2012: 289): Urbia.de forum post, <http://www.urbia.de/archiv/forum/th-3614401/Unterschrift-gefaelscht-Paket-verschwunden-Und-nun.html>, last accessed 25/7/2012.

given in example (983), such cases exist. Assume that the speaker is a doctor who talks about a hypochondriac patient.

- (983) a. Der Schani ist ein alter Hypochonder, andauernd kommt er
 the Schani is a old hypochonder always comes he
 mit anderen Geschichten daher.
 with other stories along
- b. Stell Dir vor, jetzt will^{quot} er Malaria haben.
 imagine you PART now want he malaria have-INF
- c. Und soll ich dir was sagen? Er hat wirklich Malaria,
 And shall I you something say he has indeed Malaria
 ich habe gerade die Blutproben vom Labor
 I have just the blood.test from.the laboratory
 zurückbekommen.
 back.get-PPP

‘Schani is an old hypochondriac. Each time he comes to see me, he tells a different story. Imagine, he now **claims** to have malaria. Believe it or not, I’ve just got back his blood test results from the laboratory and it says that he indeed has malaria.’

This example describes a context in which the referent encoded by the experiencer argument makes a non-verified claim about himself. Crucially, the proposition *I have Malaria* is not part of his knowledge, either he does not know whether it holds or he has a false belief. In contrast, the speaker knows that this referent indeed has Malaria. Arguably, the context given in example (983) could alternatively be interpreted in a way that the referent encoded by the experiencer argument already knew beforehand that he had malaria because he had already made another blood test at another hospital. This seems to refute hypothesis (ii). However, this context deserves a closer look. Even if it turns out that the referent encoded by the experiencer argument indeed already knew that he had malaria, the use of the reportative modal verb in example (983) contributes some resonance of doubt. How can this be accounted for? It is important to distinguish between what this referent really knows and what knowledge the speaker attributes to that referent. As it turns out, the latter type of knowledge is only relevant to the interpretation of reportative modal operators. In employing a reportative modal verb, the speaker expresses that he has no compelling evidence that the modified proposition *p* is indeed part of the referent’s knowledge. In some cases, he could have even explicitly known that *p* is not part of the referent’s knowledge. However, up to now, there are no examples of reportative modal operators attested in which the speaker knows that the modified proposition is true and part of the knowledge that is attributed to the referent encoded by the experiencer argument. Moreover, in this type of

context, a reportative modal operator would be redundant. As it seems, then, a speaker who employs a reportative modal verb expresses that he does not attribute the modified proposition *p* to the knowledge of the referent encoded by the experiencer argument. Reportative modal operators reflect the perspective of the speaker, rather than the objective truth. This explains why the speaker considers the information conveyed by reportatively modified propositions as not reliable even in contexts in which it later turns out that the referent encoded by the experiencer argument did indeed know that the proposition was true. Accordingly, the acceptability of reportative modal operators does not hinge on whether the referent encoded by the experiencer argument knows that he has malaria. Rather, the use of a reportative modal operator signals that the speaker does not attribute the modified proposition to the knowledge of the referent encoded by the experiencer argument.

Faller (2012: 289) provides an authentic example taken from the web. Just like with example (983), example (984) exhibits a configuration in which the speaker knows the proposition to be true. Regarding the knowledge of the referent expressed by the experiencer, it is left unspecified: even if the option in which the uncle is lying is not very likely, it is nevertheless not excluded. In any case, the speaker conveys a glimpse of doubt whether the uncle's conclusion is well grounded on reliable evidence or if it is true by chance.

- (984) Die Standzeit soll sehr hoch sein laut Onkels Aussage
 the service.life shall very high be-INF according Uncle's report
 und die Äste werden überhaupt nicht gequetscht, habe ich
 and the branches are at.all NEG crushed have I
 auch selbst gesehen.¹³
 also myself seen

'The service life is, according to Uncle's report, very high and the branches are not crushed at all, I have also seen it myself.'

However, it is necessary to remark that the validity of Faller's example is not beyond doubt. The phrase *habe ich auch selbst gesehen* could also refer to the second conjunct (*die Äste werden überhaupt nicht gequetscht*), which does not contain any reportative modal verb. According to this configuration, the embedded proposition would not automatically be knowledge of the speaker. Yet, the interpretation suggested by Faller is possible, even if it was not intended by the speaker.

Examples like (983) and (984) demonstrate two things: first, reportative modal verbs are compatible with situations in which the speaker knows that

¹³ As quoted in Faller (2012: 289): Werkzeug-News.de forum post, <http://www.werkzeug-news.de/Forum/viewtopic.php?p=147095>, last accessed 25/7/2012.

the embedded proposition is true. In such a context, the speaker signals that he does not know whether the proposition is really also part of the referent's knowledge or whether this referent lies, has a false belief or utters a proposition without having any evidence for its truth. Secondly, the speaker does not ascribe the embedded proposition to the knowledge of the referent encoded by the experiencer argument.

As a consequence, these observations provide evidence for hypothesis (ii). Thus, reportative modal verbs differ from their epistemic relatives in two important respects. While in the case of reportative modal verbs, it is the referent encoded by the experiencer argument which is committed to the truth of the embedded proposition, it is the speaker in the case of epistemic modal verbs. Furthermore, the use of an epistemic modal verb signals that the embedded proposition is not part of the speaker's knowledge. By contrast, the use of reportative modal verbs indicates that the embedded proposition is not part of the knowledge ascribed to the referent expressed by the experiencer argument.

Even if the CoDeC can be applied to the reportative modal verbs, this does not entail that it makes the right prediction for all modifiers that are related to epistemic modal verbs which were discussed in Chapter 3: As it turns out, they fail to capture the behaviour of relevance conditionals.

In conclusion, the CoDeC can also be applied to reportative modal verbs. In this case, the deictic centre is instantiated by the referent expressed by the experiencer argument. Accordingly, reportative modal verbs are evaluated with respect to the knowledge of the referent encoded by the experiencer argument which is realised as the subject in the case of *wollen*, and as some other covert argument in the case of *sollen*.

6.2.3 A subtle refinement

The attentive reader may raise an objection against the CoDeC as formulated in Section 6.2.2: the CoDeC appears to be formulated too strictly, as it suggests that the speaker has no knowledge about the embedded proposition at all – but this is certainly not the case. As with the utterance in example (985), the speaker already knows that the man has died. Likewise, the mother in example (986) knows that something bad happened to her daughter's mouth.

- (985) Der Mann dürfte im Schlaf gestorben sein, da die Beamten
 the man might in.the sleep die-PPP be-INF as the officers
 ihn im Bett gefunden hatten.¹⁴
 him in.the bed found had

‘The man has probably died while sleeping, as the officers found him in his bed.’

- (986) Das Mädchen hatte im Garten gespielt und plötzlich Blut
 the girl had in.the garden played an suddenly blood
 gespuckt. Die Angst der Mutter: Das Kleinkind könnte
 spewed the fear the-GEN mother the toddler can-SBJV.PST
 Glas verschluckt haben.¹⁵
 glass swallow-PPP have-INF

‘The girl was playing in the garden and suddenly she started spewing blood. The mother was afraid the toddler could have swallowed glass.’

The answer to this question leads us to an interesting relation between epistemic operators and focus background structure, which could finally reveal the precise location of the epistemic operator with respect to the proposition.

Back to example (985). The basic facts are (i) that the speaker knows the background and (ii) that the speaker knows a set of alternatives, which may be an open set, in which not all of the alternatives are known to the speaker. In contrast to a canonical assertion, the speaker is not in a position to commit himself to one of these alternatives. Formally, this could be modeled by assuming that in most of the epistemic worlds which are accessible to the speaker the man died while he was sleeping. However, in some of the worlds the man was about to get up, in others he took an overdose, in very few worlds he died in the kitchen and was put in there to his bed by his friend. In an account building on the tradition of Kratzer (1981) and Kratzer (1991), truth conditions would be sufficient in order to get the correct interpretation of her quantifiers which operate on sets of possible worlds. Maybe, an account in which the worlds are additionally weighted with respect to their probability, as suggested by Lassiter (2011: 163–164) would gain even better results for deontic and volitional modal operators.

There are a couple of obvious alternatives as to which constituent is focused. All of them contribute different conditions of usage. If the speaker knows that the event under discussion took place during the sleep, uttering example (987a) is deceiving; however, the alternatives (987b) and (987c) are pragmatically felicitous in this context. Likewise, if the speaker knows that the subject referent died, example (987b) is deceiving and (987a) as well as (987c) are pragmatically felicitous, and so forth.

- (987) a. Der Mann dürfte im SCHLAF_{foC} gestorben sein.
 alternatives={während dem Aufstehen, beim Bett machen, in der
 Küche, ...}

14 DeReKo: BVZ09/OKT.01155 Burgenländische Volkszeitung, 14/10/2009.

15 DeReKo: BRZ09/AUG.03524 Braunschweiger Zeitung, 08/08/2009.

- b. Der Mann dürfte im Schlaf geSTORBen_F sein.
alternatives={entführt worden, erschreckt, erkrankt, ...}
- c. Der MANN_F dürfte im Schlaf gestorben sein.
alternatives={die Frau, der Hund, der Hamster, ...}

As it turns out, the epistemic use of *dürfte* is focus sensitive to some moderate extent. This is reminiscent of the findings put forth by Jacobs (1988: 94), who found out that sentential adverbs can be sensitive to focus. Likewise, Bildhauer (2011: 364) points out, following Jacobs (1986), that these adverbs often occur fronted with focused constituents in the Forefield position, which highlights the particular relation between these two elements. In a similar fashion, Lassiter (2011: 113–119) notices that the epistemic adjectives *likely* and *probable* are pragmatically sensitive to focus alternatives.

A related observation was made by McDowell (1987: 236). She demonstrates that earlier claims are false, according to which epistemic utterances are always the result of the combination of a ‘known’ subject referent and an ‘unknown’ predicate. As she argues, the sentence (988) can be the result of three different epistemic conclusions.

- (988) Olaf must have murdered Yuri.
- a. Someone murdered Yuri and Olaf is most probably that someone.
 - b. Olaf murdered someone and Yuri is most probably that someone.
 - c. Olaf had something to do with Yuri’s death and murder is most probably what it was.

Another counterexample in support of McDowell’s analysis was given above in (985), in which the ‘unknown constituent’ is represented by the temporal adverbial *im Schlaf*.

At this position, the contrast to assertions becomes very evident. Following the relational concept of the focus background structure advocated by Jacobs (1988: 93), the focus background structure is organised by illocutionary operators, most notably by the assertion operator ASS. As Jacobs (1988: 95) points out, the felicitous use of the ASS operator requires that conditions are met: (i) the speaker believes that the background is true, (ii) the speaker believes that the predications consisting of background and focus is true, (iii) the addressee believes that the background is true, (iv) the addressee does not know whether the predication holding between background and focus is true.

Epistemically modified utterances do not fit neatly in this frame, as the speaker does NOT know whether the predication actually holds or not, conflicting with condition (ii). Rather, he considers it possible/likely or certain that this

predication holds. The distinct behavior of epistemic utterances could indicate that epistemic operators actually operate on the level of illocution, in other words: they are illocutionary operators. Under such a view, epistemic operators would be defined in analogy to Jacobs' (1988) ASS operator, with a modified condition (ii).

Such an approach is reminiscent of Lyons' (1977: 805) reasoning, who argues, based on intuitive grounds, that epistemic operators occupy the same structural position as question operators; a detailed discussion is given in Section 4.22.1.

Yet, as it was shown in Section 4.23, there are a couple of obstacles for this endeavour, as epistemic operators appear to be part of the proposition. Moreover, they occur embedded under information seeking polarity and *wh*-questions, which demonstrates that these two types of operators occupy different positions, as it was shown in the Sections 4.11 and 4.12. Hence, epistemic operators can only be illocutionary operators if there is a structural hierarchy of illocutionary operators. Furthermore, it is not clear how reportative modal operators could be integrated into this approach. Finally, there is another challenge that remains to be mastered. If epistemic operators really operate on the level of illocutions, it needs to be shown which contribution they make to Stalnaker's (1978) common ground: As they do not provide new shared knowledge, their effect cannot be the elimination of those possible worlds which are not in line with the newly added proposition. However, all of these issues will be left for future research.

6.3 A unified analysis for epistemic and reportative modality

As was seen in the previous section, there are different referents with respect to which an epistemic operator can be evaluated. At this point, it still remains mysterious what precisely governs the identification of the deictic centre.

In the upcoming section, it will be demonstrated how deictic centres are anchored to appropriate referents. The identification is based on a hierarchy of salience, which ranks the most likely candidates that come into consideration for the deictic centre, as will be demonstrated in Section 6.3.1. This hierarchy turns out to be a powerful tool, as it is not only capable of explaining the correct identification of the deictic centre, it also accounts for the fact that epistemic modal verbs are excluded from the non-canonical environments, and that reportative modal verbs can occur in some of these environments at the same time, as will be pointed out in Section 6.3.2.

6.3.1 Hierarchy of Salience

As it seems, the deictic centre of an epistemic operator is always anchored to the closest syntactically represented referent which can be interpreted as an attitude holder, whereas closeness is defined in terms of the syntactic clause hierarchy. Accordingly, the closest candidates are appropriate arguments which are introduced by the modal operator itself. Such configurations only exist with reportative modal verbs: Whereas *wollen* involves an experiencer argument which is realised as a subject, *sollen* involves a covert experiencer argument which is contextually supplied. The next candidates are appropriate arguments which are introduced by a predicate that embeds an epistemic modal verb. In the most typical case, these verbs are attitude predicates or predicates of communication. Finally, the last candidate is the most salient referent of the speech act, which is the speaker in declarative clauses and the addressee in information seeking questions and conditionals. As there is always such a referent, epistemic modal verbs are by default evaluated with respect to the most salient referent of the speech act unless there is another appropriate candidate which occurs in a closer distance to the epistemic operator.

(989) Hierarchy of Salience

1. the experiencer arguments of the predicate which introduce the epistemic modal operator
2. the experiencer argument of an attitude predicate in the superordinate clause
3. the most salient referent of the speech act

Regardless of which of these candidates the epistemic modal operator will be anchored to, the CoDeC has to be applied. From this analysis it follows that despite their substantial differences reportative operators could be seen as epistemic operators which are already anchored at the level of the verb itself. Given these conditions of anchoring, it is finally possible to account for the incompatibility of epistemic modal verbs with the non-canonical environments discussed above.

6.3.2 Operators which impose selectional restrictions

As was illustrated in Chapter 4, epistemic modal verbs are excluded from eight environments: (i) they do not occur with verbless directional phrase complements, (ii) they cannot be separated from their infinitive complements in *wh*-clefts, (iii) they do not undergo nominalisation, (iv) they are banned from adverbial infin-

itives, and, they cannot be (v) embedded under circumstantial modal and other auxiliary verbs, (vi) predicates of desire, (vii) imperative operators or (viii) optative operators. Regarding these contexts, the question arises what these configurations have in common.

Upon closer inspection, it turns out that the environments (iv)–(viii) involve some sort of circumstantial modal operator. As was pointed out by Nissenbaum (2005: 145), Grosz (2014), rationale clauses, which are closely related to the adverbial infinitives under discussion here involve a covert (circumstantial) modal operator.

Furthermore, this circumstantial modal operator bears scope over the epistemic modal operator. As observed by many authors, such as Cinque (1999: 87), Eide (2005: 9) and Colomo (2011: 111), the scope of a circumstantial modal operator is an environment from which epistemic modal operators are excluded. Based on the findings made in the previous sections, it is now possible to provide an explanation for this behaviour. Evidently, circumstantial operators are a type of operator which cannot embed unbound variables for the deictic centre:

- (990) Circumstantial modal operators fail to embed structures which contain an unbound variable for the deictic centre.

This condition makes a whole range of predictions. Among others, circumstantial modal operators should embed epistemic operators whose variable for the deictic centre is bound. In general, it is expected that configurations in which a circumstantial operator directly embeds an epistemic modal operator whose deictic centre is not bound (991) should be by far less acceptable than configurations in which a circumstantial operator embeds some sort of intervening attitude predicate under which the epistemic operator is embedded and which introduces a referent argument eligible to serve as attitude holder (992).

- (991) * CIRC [EPIST(deictic centre=?)]

- (992) CIRC [ATT(attitude holder) [EPIST(deictic centre=attitude holder)]]

First of all, consider epistemic modal verbs which occur in the antecedent of a conditional. As shown in Section 4.17, the acceptability of epistemic modal verbs in antecedents of event related conditionals is fairly limited. If the condition stated under (990) is correct, it would be expected that the acceptability of epistemic modal verbs in antecedents of event related conditionals should increase if the modal is embedded by an intervening attitude predicate which introduces an argument that can bind the deictic centre introduced by the modal. The example below given by Fintel and Gillies (2008: 93), contains an antecedent in which the epistemic modal verbs is embedded by the attitude predicate *realize*:

- (993) If Blofeld realizes you might be in Zürich, you can breathe easy – he'll send his henchman to Zürich to find you.

As shown in Section 4.17, it is not certain whether conditionals of the type illustrated in example (993) are indeed to be seen as event related conditionals. This issue is not really relevant here. What is crucial is the fact that the epistemic modal occurs embedded under an attitude predicate makes the whole conditional more acceptable.

Secondly, if this condition is right, it is also expected that reportative modal verbs should be significantly more acceptable embedded under circumstantial modal operators. As was seen in Section 5.1, they are attested in adverbial infinitives, embedded under auxiliaries, and in optatives.

The analysis proposed above gains further support by the behaviour of epistemic *lassen*, which was discovered by Reis (2001: 308). Interestingly, this pattern appears to be restricted to imperatives. As was demonstrated in Sections 2.1.1.3 and 4.13, the traditional six modal verbs lack an imperative form, except for *wollen*, which can rarely be found in such patterns if it is used without an infinitive complement. According to the selectional restrictions of circumstantial modal operators (cf. 990), it is expected that any epistemic operator that involves a bound variable for the deictic centre should in principle be acceptable in imperatives. As *lassen* has an independent imperative form and modal semantics, it provides an interesting case.

In the case of epistemic *lassen*, the deictic centre is identified with the subject referent. As it is used as an imperative, the subject remains syntactically unrealised and it is identified with the addressee. If the CoDeC is correct, it is expected that the speaker does not attribute the embedded proposition *it costs 100,-* to the knowledge of the addressee. And indeed, this appears to be the case in example (995).

- (994) A: Was kostet das Buch wohl?
 what costs the book maybe

- (995) B: Lass es mal 100,- kosten.
 let-IMP it PART 100 COST-INF

A: 'How much could the book be?'

B: 'Let it be 100,- /Assume that it costs 100,-.'

As predicted, the speaker expects that the embedded proposition is not part of the deictic centre's knowledge. In this respect, *lassen* behaves just as canonical epistemic modal verbs do. In contrast, the deictic centre is realised as the subject argument of the epistemic modal verb in the case of *lassen*. As a consequence, the variable for the deictic centre is already instantiated within the scope of the imper-

ative operator. As predicted by the analysis above, this results in a grammatical configuration.

In a similar vein, nominalisation could be regarded as an operation which only applies to verbs that contain no unbound variable for the deictic centre. This would neatly account for the fact that reportative modal verbs can be subject to nominalisation whereas epistemic modal verbs cannot.

There are only two of the non-canonical environments discussed in Chapter 4 which are not accounted for with respect to selectional restrictions of a superordinate operator: (i) the fact that epistemic modal verbs cannot be separated from their infinitive complements in *wh*-clefts and (ii) their incompatibility with verbless directional complements. Neither of the cases can be accounted for in terms of anchoring of the deictic centre. Interestingly, these environments are equally unacceptable for reportative modal verbs. As it seems, the reason to their ungrammaticality is due to the selectional restrictions of the epistemic modal verb itself.

As was shown in Section 5.1.5, it appears to be possible under certain conditions to identify unbound variables of the deictic centre by a rule of accommodation, as proposed by Lewis (1979: 172) and Kratzer (1981: 61).

6.4 Alternative analyses

There are other analyses which explain the restricted compatibility of epistemic modal verbs with the environments discussed in Chapter 4. The most explicit accounts for German were developed by Wurmbrand (2001: 182–204) and Erb (2001: 116–125), who argue that epistemic modal verbs have to be considered as auxiliaries which have lost all properties typical of the category ‘verb’. They exhibit an impoverished morphology and they cannot be used as non-finite forms (infinitive, past participle) anymore. Both approaches follow Cinque’s (1999) cartographic tradition, assuming that the different types of modal verbs are merged as different functional categories in the clausal hierarchy. In Wurmbrand’s (2001: 183) analysis, epistemic modal verbs are merged in Aux^0 , circumstantial modal verbs with raising patterns in Mod^0 and circumstantial modal verbs with control patterns in v^0 , as is illustrated on the left-hand side of Figure 6.1. Turning to Erb’s (2001: 124) approach, she suggests that epistemic modal verbs are merged in a functional category for sentence mood M^0 , circumstantial modal verbs with raising structure in Mod^0 and circumstantial modal verbs with control structure in V^0 , as shown on the right-hand side of Figure 6.1. In both analyses, modal verbs with control syntax are considered as lexical verbs, as they involve proper referential subject arguments.

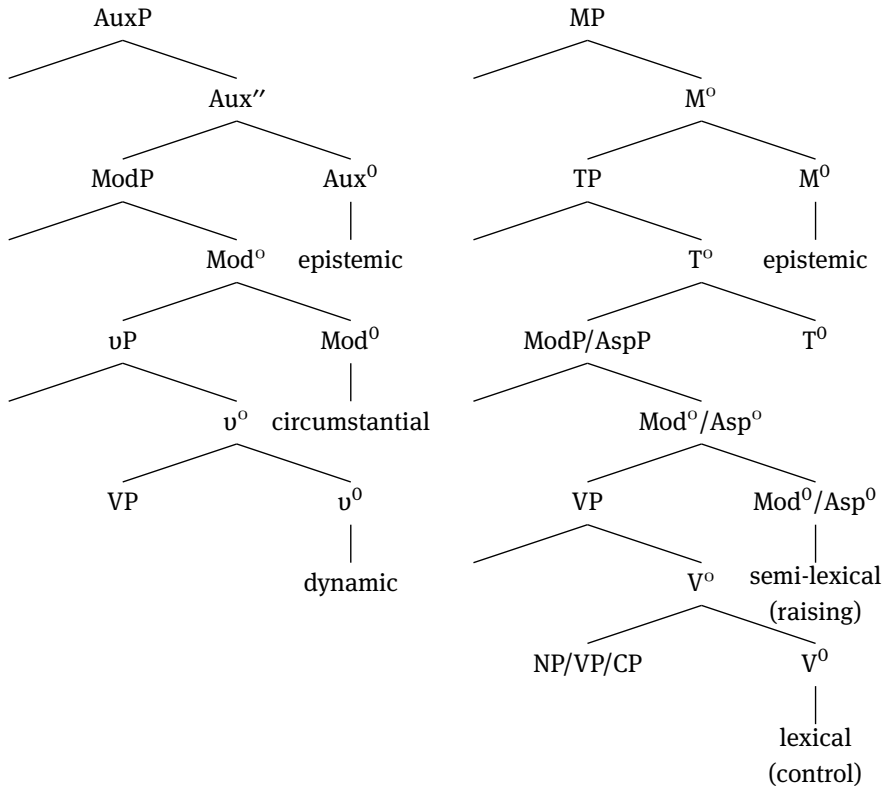


Fig. 6.1: Wurmbrand (2001) (left) and Erb (2001) (right)

In essence, Wurmbrand and Erb argue that epistemic modal verbs are functional elements rather than lexical verbs and accordingly they have lost the ability to occur in non-finite contexts. Askedal (1997: 13, 1998: 60) has adopted a similar view. Analogous approaches have been suggested for English, cf. Butler (2003) and Roberts (2003).

Unfortunately, these approaches face a whole range of serious challenges. Firstly, it was demonstrated in Section 4.1 and Section 4.2 that epistemic modal verbs can occur in non-finite environments under certain conditions: if the matrix predicate involves an argument which can be interpreted as an attitude holder. The existence of non-finite occurrences of epistemic modal verbs cannot be explained under the assumption that epistemic modal verbs are not verbs but affix-like entities which are merged in functional projections for inflection or more abstract elements.

Secondly, it is not evident how these accounts treat reportative modal verbs. In particular, it is necessary to account for the parallel behaviour of reportative modal verbs and epistemic modal verbs. This concerns, on the one hand, their ability to embed predications consisting of an identified individual and a predicate which refers to a state that is not likely to change, or a predicate that refers to a past event. And on the other hand, their requirement to be anchored to some deictic centre. Given these properties, one could assume that reportative modal verbs are merged as a functional category which occupies a high position in the clausal hierarchy such as Aux^0 or M^0 . Yet, reportative modal verbs involve referential arguments: *wollen* selects an animate referential subject argument and *sollen* has an argument which is usually not overtly realised. Following the canonical assumption, higher functional projections do not contribute proper arguments. Accordingly, reportative modal verbs cannot be merged in the same functional projection as epistemic modal verbs. Alternatively, one could assume that reportative modal verbs are lexical categories and merged as V^0 or v^0 . In this case, the necessity of reportative modal verbs to be anchored to a deictic centre appears to be detached from the status of their category. Accordingly, variables for deictic centres could also be introduced by lexical categories. As a consequence, the question arises why epistemic modal verbs need to be functional categories at all.

Thirdly, it is not evident how these accounts could capture the fact that reportative modal verbs can be subject to nominalisation whereas their epistemic cognates cannot. Moreover, these accounts even fail to explain why circumstantial modal verbs with raising structure can be nominalised, as nominalisation is traditionally considered as an operation which only applies to lexical categories but not to functional ones.

Fourthly, Wurmbrand's (2001: 183) and Erb's (2001) analyses cannot account for differences between reportative and epistemic modal verbs regarding non-finite environments. Whereas epistemic modal verbs are very restricted in this respect, reportative modal verbs can occur in a couple of contexts from which their epistemic counterpart are excluded, such as adverbial *ohne-zu* infinitives or embedded under auxiliaries. In general, it is not clear to what extent these accounts are capable of capturing the differences between epistemic modal verbs and reportative modal verbs, as described in Chapter 4 and Chapter 5.

Moreover, cartographic approaches, such as those presented here, are confronted with ordering paradoxes, as there are many more alternatives of combining modal verbs than these approaches would predict. This is discussed by Maché (2012: 132) in more detail.

Considering these challenges, it appears to be more efficient to analyse all of the different syntactic patterns of modal verbs as elements of the category 'verb'. Reportative modal verbs and epistemic verbs are special in that they introduce a

variable for a deictic centre which needs to be bound. Both types of verbs only differ with respect to the domain in which the deictic centre is actually instantiated.

6.5 Summary

In this chapter, it was pointed out that the distributions of epistemic modal verbs and reportative modal verbs can be accounted for in terms of anchoring of the deictic centre. Epistemic modal operators introduce a variable for the deictic centre with respect to which they are evaluated. In order to be interpreted, this variable needs to be instantiated by an appropriate attitude holder. The instantiation of the deictic centre follows the Hierarchy of Salience, according to which the variable will be anchored to the closest appropriate argument which can be interpreted as an attitude holder. In the most canonical case, the variable will only be identified at the level of the speech act, which results in a configuration in which the deictic centre is anchored to the speaker.

Moreover, there are various contexts that do not tolerate unidentified variables. Circumstantial modal operators fail to embed linguistic structures which contain a free variable for a deictic centre. This explains the behaviour of epistemic modal verbs, which are generally banned from the scope of a circumstantial modal operator. Furthermore, it was shown that reportative modal operators can be considered as particular epistemic modal operators, which introduce a variable for the deictic centre that is anchored to an argument of the modal operator itself. As a consequence, these variables introduced by reportative modal verbs are already instantiated at a very local level. In turn, this accounts for the fact that reportative modal verbs can occur in the scope of circumstantial modal operators as they do not contain any unbound variable. As was pointed out, nominalisations are another environment which is not compatible with unbound variables for the deictic centre. As a consequence, they do not apply to epistemic modal verbs whereas they do apply to reportative modal verbs. The behaviour of circumstantial modal operators and nominalisations could be captured in terms of selectional restrictions: These operators are restricted to linguistic structures which do not contain a free variable for the deictic centre.

From the facts discussed above it follows that, despite their substantial differences, reportative operators could be seen as epistemic operators that are already anchored at the level of the verb itself. Thus, neither epistemic modal verbs nor reportative modal verbs need to be regarded as functional categories. They can be neatly described as lexical verbs which are characterised by the fact that they introduce a variable for the deictic centre that needs to be bound according to a couple of conditions.

7 On black magic: A diachronic explanation

Each syntactic pattern described in Section 2.2 corresponds to a different stage of grammaticalisation. Accordingly, the descriptions given in that section roughly trace the historical development of each individual verb. The grammaticalisation of epistemic modal verbs typically involves the steps indicated in (996). Similar trajectories were proposed by Lehmann (1995: 33) and Diewald (1999: 2, 34).

(996) transitive verb \Rightarrow control verb with event modification \Rightarrow raising verb with event modification \Rightarrow epistemic verb.

For most of the verbs considered above, the path of development is slightly different or even more complex. An extensive description of individual developments was given in Section 2.2.9, where *brauchen* is discussed, the youngest epistemic modal verb, which only grammaticalised in the 19th century. The following section will only address the last step of grammaticalisation, when circumstantial modifiers turn into epistemic ones, as we saw in the previous chapters that the epistemic patterns are the most essential ones for the verbs presently under investigation. As for the step from transitive verbs to verbs which select infinitive complement, the reader is referred to Paul (1920: 95) and Fritz (1997: 68), who argue that the bare infinitive complements have their origin in former accusative NPs.

As has often been observed, it is fairly intricate to determine the precise interpretation of a given traditional modal verb. By means of the diagnostics developed in Chapters 2 to 6, the characteristics of circumstantial modal verbs and their epistemic modal counterparts were identified. Moreover, it was shown in which respects these two types of verbs differ. These differences are essential for an understanding of the diachronic development of modal verbs. Following the most prominent hypothesis advocated by Traugott (1989: 35), Sweetser (1990), Bybee, Perkins and Pagliuca (1994: 195), Fritz (1997), Diewald (1999), Axel (2001: 45), epistemic modal verbs emerged diachronically from their circumstantial cognates.

In Section 7.1, a small corpus study on the behaviour of epistemic modal verbs from the 16th century will be presented. As was argued by Fritz (1991: 45, 1997: 94) and Diewald (1999: 365), this is the crucial period in which the use of epistemic modal verbs became frequent in German. As it turns out, almost all of the epistemic modal verbs found in this corpus select stative predicates that refer to states that cannot be changed. In contrast, circumstantial modal verbs typically subcategorise for infinitive complements that contain eventive predicates. Accordingly, there are good reasons to assume that the first epistemic modal verbs in history selected stative complements. A similar observation has already

<https://doi.org/10.1515/9783110411027-007>

been made by Abraham (1991), Abraham (2001) and Abraham (2005) and Leiss (2002).

In Section 7.2, an account will be provided which explains why the first epistemic modal verbs in history selected stative predicates. This approach is based on a pragmatic rule of accommodation in the spirit of Lewis (1979: 172), which is considered as *black magic* by Kratzer (1981: 61).

7.1 Epistemic modal verbs in Early New High German

As is known, polyfunctional modal verbs occurred in Germanic languages from the early Middle Ages on. Krause (1997: 95) discusses a whole range of potentially epistemic modal verbs from Old High German. In most of the cases, the relevant verb is *mugan*. Yet, as Axel (2001: 45 Fn. 31) has pointed out, the status of many of her examples is rather doubtful. At any rate, there are a few examples of *mugan* which are epistemic beyond doubt, e.g. example (997). Likewise, Denison (1993: 298) provides a range of instances from Old English. The most convincing examples involve the verb *magan*, as is illustrated in example (998). This pattern is very similar to the German *es kann sein*-pattern, which is almost always interpreted in an epistemic way, as was illustrated by Doitchinov (2001: 119) and in examples (94)–(97) discussed in Section 2.2.1.5. Moreover, Doitchinov (2001) discusses individual occurrences of *sculan* and *willan*. Yet, their status appears to be less clear.

- (997) Ther evangelio thar quit, theiz mohti wesan sexta zit¹
 the Gospel there says this may-SBJV.PST be-INF sixth hour
 ‘The Gospel says at this point that it might have been the sixth hour.’
- (998) Swiþe eaþe θæt mæg beon θæt some men θencan...²
 very easily that may be-INF that some men think
 ‘It may very well be that some men think...’

As the data collected by Bolkestein (1980: 89–103, 123–133) show, the ambiguity of related verbs was established already in Latin: The necessity verbs *debere* ‘must’ and *oportet* ‘must’ could already alternatively be interpreted in a circumstantial and an epistemic manner. Accordingly, the development of ambiguous polyfunctional modal verbs in Germanic languages could be a result of language contact with Latin.

¹ *Otfrid* II, 14, 9–10 (around 870), as quoted in Krause (1997: 95), translated by JM.

² *The Blickling Homilies* 21.17 (around 980), as quoted in Denison (1993: 299).

Yet, regarding West Germanic languages, epistemic modal verbs remain rare until the early 16th century. As Müller (2001: 244) has observed, there are only a few convincing occurrences of epistemic modal verbs in the Prose Lancelot, which was written in the 13th or 14th century. He discussed one example of epistemic *mögen*, and one of reportative *sollen*. According to Müller (2001: 243), the scrutinised corpus contains 200,000 word form tokens. Likewise, Denison (1993: 298) has noticed that epistemic uses of modal verbs in English are only marginally developed in the Old and Middle English period. They are not systematically established until Early Modern English.

In a similar vein, Fritz (1991: 45, 1997: 94) and Diewald (1999: 365) have demonstrated that epistemic modal verbs only became frequent in the course of the Early New High German period. According to these findings, the present study investigates Ulrich Schmid's *Neuwe Welt* published in 1567, which is a travelogue of Portuguese discoverers travelling to India.³ The underlying corpus encompasses the preface plus the first chapter, which comprise in total 44,687 word form tokens.

Regarding the genre, it should be seen more as a narrative text rather than a journalistic report. A journalistic report would rely on different sources or even just rumours, and in order to be objective it would evaluate them with regard to the preconceived convictions of the author. This is fairly different from a travelogue, which is normally founded on only one source of evidence: The sensory input and the immediate experience of the author himself.

In contrast to the investigation carried out by Müller (2001: 244), there are at least seven unambiguously epistemic modal verbs among 44,000 word form tokens. The frequency of epistemic modal verbs in *Neuwe Welt* appears to be considerably higher than in the Prose Lancelot. As already in previous stages of West Germanic languages, the verb which is most frequently attested with an epistemic interpretation is *mo^egen* (5 times), followed by *ko^ennen* (1) and *mu^essen* (1). As in the case of the Old High German example (997) provided by Krause (1997: 95), an epistemic reading appears to become more likely if the relevant verb is specified for the subjunctive of the past. Only two occurrences are inflected for the indicative present (cf. 999–1000), one for the indicative past (cf. 1001), whereas four occurrences exhibit the subjunctive of the past (cf. 1002–1005). This shows that the subjunctive of the past facilitates an epistemic interpretation.

³ I am grateful to Christiane Wanzeck, who provided me with a hard copy of the original print from 1567.

- (999) Vnnd erstlich gibt er jhm sechtzig Kanons an gold / das ist ein
and first gives he him sixty Kanons of gold that is a
Mu^entz die also heist / vnd mag zusammen drey
coin that alike be.called and may altogether three
Portugalesischer Croisaden seyn / das were dreissig
Portuguese Croisades be-INF that be-SBJV.PST thirty
Ducaten.⁴
ducats
'At first he gives him sixty golden Kanons, that so-called coin might value about thirty
Portuguese Croisades or thirty ducats.' (epistemic)
- (1000) Vnd welches er nach dieser sach geda^echte / das were
and which he after this incident think-PST this be-SBJV.PST
vrsach gnug / wie vil er jetzundt vielleicht auff vns
reason enough how much he now maybe about us
halten mag / das er vns hernach auch verachtet.⁵
think-INF may that he us then also disdains
'And the thoughts which he had after this incident were reason enough that he would
disdain us even afterwards – whatever he may think about us now.' (epistemic)
- (1001) Vnd wie er im wenden war / da vernam er sieben oder acht
and as he at veer-INF was there noticed he seven or eight
Blut Schiffe / die jm aus der Inseln mit auffgezogenen Segel
blood ships the him from the islands with hoisted sails
nachfuhren / vnnd mochten von des Nicolas de Cocillo schiff
followed and may-PST from the-GEN Nicolas de Cocillo ship
ein grosse meil wegs weit seyn.⁶
a large mile way-GEN away be-INF
'And as he was about to veer, he noticed seven or eight blood ships that followed him
from the island with hoisted sails and they may have been about one large mile away
from the Nicolas de Cocillo's ship.' (epistemic)
- (1002) Des Sontags / vngefährlich vmb Vesper zeit / kamen die
the-GEN sunday-GEN about at vespers time came the
vnsern bey drey Inseln / die alle sehr klein waren / vnd
ours by three islands the all very small were and

⁴ Ulrich Schmid, *Neuwe Welt*, p. 19b, (1567).

⁵ Ulrich Schmid, *Neuwe Welt*, p. 21b, (1567).

⁶ Ulrich Schmid, *Neuwe Welt*, p. 7b, (1567).

mo^echte eine von den andern vielleicht vier meil weit
 may-SBJV.PST one from the others maybe four miles away
 seyn.⁷
 be-INF

‘They arrived on sunday at vespers time at three islands that were all very small and that might have been away four miles from each other.’ (epistemic)

- (1003) Es mo^echte wol seyn / daß sie etwan ein wenig auß
 it may-SBJV.PST well be-INF that she eventually a little of
 dem weg gefahren weren / vnd darumb ka^emen sie
 the way travel-PPP be-SBJV.PST and therefore come-SBJV.PST they
 in das wetter / das regiert gewoehnlich vmb die zeit⁸
 in the weather REL.PRN reigns usually around the time

‘It may be that they eventually deviated a little bit from the course and therefore they were exposed to weather which is usual at that period.’ (epistemic)

- (1004) [...] hielte er dafu^er / es mu^este der Ko^enig auß Portugal
 thought he that it must-SBJV.PST the king of Portugal
 ein dapfferer geherzter Mann seyn.⁹
 a brave hearted man be-INF

‘He thought that the King of Portugal must be a bold and brave man.’ (epistemic)

- (1005) darab der Oberst sehr froh ward / denn er gedachte bey
 about.that the colonel very happy got for he thought by
 jhm selbst / dieweil er zu Leuten kommen were / die
 him self because he to people come be-SBJV.PST the
 etlicher massen Schiffung hetten / so ko^endte Indien nicht
 many size navigation had thus can-SBJV.PST India NEG
 mehr weit seyn¹⁰
 more far be-INF

‘Therefore the colonel became very happy, for he thought that since he came to people with the knowledge of navigation India could not be that far any more.’ (epistemic)

As illustrated in example (1000), the concessive epistemic interpretation of *mag* was already available in the 16th century. In the example provided above, it occurs in a clause which has to be analysed as a concessive conditional along the lines suggested by König and Auwera (1988: 118), as it is introduced by a free choice

⁷ Ulrich Schmid, *Neuwe Welt*, p. 7b, (1567).

⁸ Ulrich Schmid, *Neuwe Welt*, p. 36a, (1567).

⁹ Ulrich Schmid, *Neuwe Welt*, p. 15a, (1567).

¹⁰ Ulrich Schmid, *Neuwe Welt*, p. 7a, (1567).

Tab. 7.1: Circumstantial modal verbs with stative complements – in Schmid's *Neuwe Welt* (1567)

circumstantial modal verb	stative complements	percentage
<i>mo^egen</i> (91)	<i>seyn</i> (3), Kimean (3; <i>wissen, leiden</i>)	6.59 %
<i>ko^ennen</i> (154)	<i>seyn</i> (3), Kimean (4; <i>haben, wissen</i>)	4.55 %
<i>mu^essen</i> (33)	<i>seyn</i> (3), Kimean (2; <i>haben</i>)	15.15 %
<i>wollen</i> (307)	<i>seyn</i> (7), Kimean (7; <i>haben</i>)	4.56 %
<i>sollen</i> (179)	<i>seyn</i> (9), Kimean (3; <i>freuen, halten, haben</i>)	6.70 %
<i>du^erffen</i> (22)	<i>seyn</i> (1)	4.55 %

item *wie vil*. The epistemic interpretation of *mag* in the pattern above is even more plausible, considering that Menedéz-Benito (2010: 33) has shown that free choice items have an affinity to occur with possibility modal operators which can also be epistemic.

Moreover, it deserves closer attention that six out of the seven epistemic modal verbs attested in this corpus occur in non-embedded main clauses. There is only one epistemic modal verb which occurs in an embedded clause (cf. 1004). Yet, the respective complement clause lacks a subordinative conjunction and exhibits V2 order, which is generally regarded as a characteristic of non-integrated complement clauses, as was pointed out by Antomo and Steinbach (2010: 12), among others. Rather, it should be analysed as a clause which is adjoined to the matrix VP.

Apart from that, the epistemic modal verbs mentioned above share another essential characteristic. All of them select stative predicates as complements: most notably, the copula *seyn* 'be', as illustrated in examples (999) and (1001)–(1005), or the mental state predicate *halten* 'consider', as shown in example (1000). Many of them refer to a state which cannot be changed, or is not likely to change.

In contrast, Maché (2008: 401) has shown that circumstantial modal verbs in Schmid's *Neuwe Welt* occur by far less frequently with stative complements. The precise figures are illustrated in Table 7.1. This is in accordance with the observations made by Abraham (1991), Abraham (2001) and Abraham (2005) and Leiss (2002), who have demonstrated that circumstantial modal verbs have a preference for predicates with an eventive semantics.

Aside from the unambiguous occurrences of epistemic modal verbs, the corpus contains roughly ten more instances of modal verbs which could be interpreted in an epistemic manner under certain conditions. Interestingly, they are characterised by a couple of preferences. As Maché (2008: 393) has already pointed out, all of these ambiguous occurrences select eventive predicates as a complement. Furthermore, they mostly occur embedded under attitude predicates. Finally, these modal verbs typically bear past subjunctive morphology. Maché

(2008: 390) has already suggested that the choice of the subjunctive of the past morphology could be triggered by the syntactic context. As he has illustrated, *mo^egen* occurs in embedded clauses in 76 out of 99 cases, in which it is mostly specified for the subjunctive of the past.

In what follows, some of the ambiguous instances will be inspected more closely. The most likely interpretation of *mo^egen* in example (1006) is an ability reading. This corresponds to the manner in which it was used in Old High German. At this period, the verb was frequently employed to attribute an ability to the subject referent. Moreover, the modal verb is realised as an IPP participle which is embedded by a perfect tense auxiliary with subjunctive of the past morphology. This is an environment which is not likely to host epistemic operators.

- (1006) Bontaibo verwunderte sich sehr / wie sie zu wasser hetten
 Bontaibo wondered REFL very how they at water had
 kommen mo^egen / uñ fragten jn was sie sucheten /
 come-INF may-PPP(ipp) and asked him what they searched
 weil sie so weit gefahren weren:¹¹
 because they that far travel were
 ‘Bontaibo was very surprised at what had enabled them to come across the sea and
 asked them what they were looking for, since they were travelling so far.’

Furthermore, there are usages of *mo^egen* which are fairly likely to be interpreted in a circumstantial manner. Some of them are reminiscent of possibility modal verbs which quantify over situations, such as the English verb *can*, which is discussed in Section 3.2. In examples (1007)–(1010), the speaker expresses that he is aware of the possibility that the state of affairs expressed by the proposition can happen, under certain conditions.

- (1007) Denn der Hafe wer besser daselbst / denn zu Calecut /
 for the harbour be-SBJV.PST better there than at Calecut
 da die seit sehr gefehrlich ist / vnnd die Schiff mo^echten
 where the coast very dangerous is and the ship may-SBJV.PST
 vielleicht daselbst verderben.¹²
 maybe there perish-INF
 ‘For that harbour was better than the one at Calecut where the coast is so perilous
 that the ship could maybe get lost.’

¹¹ Ulrich Schmid, *Neuwe Welt*, p. 20a, (1567).

¹² Ulrich Schmid, *Neuwe Welt*, p. 21a, (1567).

- (1008) denn er wuste nicht / was jme etwan begegnen
 for he knew NEG REL.PRN him eventually happen-INF
 mo^echte.¹³
 may-SBJV.PST
 ‘For he didn’t know what could (perhaps) happen to him.’
- (1009) Auch solte er bedencken / wie es nach seinē todt jnen
 also shall-SBJV.PST he reflect how it after his death them
 allen ergehen mo^echte.¹⁴
 all go-INF may-SBJ.PST
 ‘Moreover he should imagine how their fate would be when he died.’
- (1010) denn sie furchteteten / es mo^echte jhnen begegnen
 for they feared it may-SBJV.PST them happen-INF
 was jhn S. Helenen Hafen begegnet war¹⁵
 REL.PRN them S. Helena port happen-PPP was
 ‘For they were afraid that the same could (possibly/presumably) happen to them that happened to them at port S. Helena.’

Summing up, most of the examples (1006)–(1010) are fairly likely to be interpreted in a circumstantial manner. As a consequence, those instances which unambiguously involve epistemic modal verbs behave in a fairly uniform manner: They all select some sort of stative predicate which, in many cases, refers to a state which is not likely to be changed.

Regarding the situation of modal verbs in Early New High German, it appears to be plausible that the first epistemic modal verbs in history originally selected stative predicates. The circumstantial modal verbs found in Ulrich Schmid’s *Neuwe Welt* dominantly occur with eventive predicates as complements, which conforms to the hypothesis formulated above, according to which circumstantial modal verbs are event modifiers, as illustrated in Section 3.2. In opposition to that, epistemic modal verbs are frequently attested with stative predicates which refer to a state which is not likely to change. Accordingly, the grammaticalisation of modal verbs could be seen as a change from event modifiers into propositional (or speech act) modifiers. The following section will provide a detailed scenario of how epistemic modifiers have most likely evolved.

¹³ Ulrich Schmid, *Neuwe Welt*, p. 21a, (1567).

¹⁴ Ulrich Schmid, *Neuwe Welt*, p. 21a, (1567).

¹⁵ Ulrich Schmid, *Neuwe Welt*, p. 5b, (1567).

7.2 The Rule of Accommodation as a driving force of language change

At this point, it is important to notice that circumstantial modal verbs can occasionally be combined with typical stative predicates such as *sein* or *haben*. Likewise, epistemic modal verbs are not restricted to stative predicates but can sometimes also select eventive predicates.

At first glance, it appears that these configurations are in conflict with the hypothesis outlined in Section 3.2, according to which circumstantial modal operators are event modifiers – why should an event modifier modify a state? There are several authors, such as Kratzer (1995: 148) and Maienborn (2003: 178, 193, 216), who have suggested that highly abstract stative predicates can be transformed into more eventive predicates by means of pragmatic mechanisms. As they assume, there is a class of stative predicates (Individual Level Predicates in terms of Carlson (1977), Kratzer (1995) and Diesing (1992) or Kimean State Predicates in terms of Maienborn (2003)), which do not involve a Davidsonian event argument. Following their ideas, an event modifier should not modify such a stative predicate because it lacks an event argument. Correspondingly, a circumstantial modal verb is restricted to the modification of predicates which involve an event argument. If it selects a stative predicate such as *sein*, this would result in a configuration which violates the selectional restrictions imposed by the circumstantial modal.

As suggested by Lewis (1979: 172) and Kratzer (1981: 61), there is a way of providing the required type of complement if it is missing. This rule can be applied under certain circumstances and is known as the Rule of Accommodation:

Rule of Accommodation

If the utterance of an expression requires a complement of a certain kind to be correct, and the context just before the utterance does not provide it, then *ceteris paribus* and within certain limits, a complement of the required kind comes into existence.

As Kratzer (1981: 61) remarks, this rule “is black magic, but it works in many cases.” It does in the case of circumstantial modal operators. Maienborn (2003: 178, 193, 216) has proposed two pragmatic mechanisms that can supply a stative predicate with an event argument if one is missing. In her reasoning, any Kimean state predicate lacks an event argument in the lexicon, as illustrated in Maienborn (2003: 106). Accordingly, these predicates by default refer to temporally unbound states. They can be delimited if a specific event argument is supplied. This can be provided by the Temporariness Effect, which introduces temporal boundaries for the state, as exemplified in *She was tired*. Moreover, the Agentivity Effect can

turn a state into a volitionally controlled action, which is, in turn, temporally restricted: *Dafna is being polite*. In other words, any predicate which is selected by a circumstantial modal verb will be interpreted as a predicate which refers to a temporally restricted state or event.

As was shown in Sections 2.2.1.5 and 3.3, there are contexts in which the communicative effect of an epistemic possibility verb is almost identical to the communicative effect of a circumstantial possibility verb. Correspondingly, it is a challenging endeavour for the addressee to guess which alternative the speaker has realised and intended.

This type of context is the typical situation in which reanalysis takes place. There are two possible alternatives: The operator under consideration could either be interpreted as a practical possibility verb supported by pragmatic repair mechanism, or as an epistemic modal verb. As the latter interpretation does not require a pragmatic repair mechanism in order to be acceptable, it is less complex.

As was demonstrated by Lightfoot (1979: 375), Roberts and Roussou (1999: 1022) and Roberts (2003: 16) language learners tend to assume the least complex linguistic analysis for the input to which they are exposed. Accordingly, any language learner would prefer the analysis built on the epistemic modal verb over the analysis which involves a circumstantial modal verb that is combined with an illicit complement, requiring an opaque repair mechanism.

At this point, the question arises what role the subjunctive of the past plays in this scenario. As was seen, the majority of epistemic modal verbs in earlier stages of German seem to be specified for the past. The use of the subjunctive might be an indicator of decreased commitment. In Sections 2.2.1.5 and 2.2.2.5, it was demonstrated that the subjunctive of the past on epistemic modal verbs indicates that some of the premises on which the evaluation is based are not verified.

7.3 Summary

Of course, the analysis outlined in the present chapter remains very sketchy. In the near future, when large scale electronic corpora for historical data will be available, it will be possible to provide an analysis which is based on more solid empirical foundations. This section indicates what direction it is fruitful to pursue for future research on grammaticalisation. The type of the embedded predicate appears to play a key role in the development of epistemic modal verbs. As shown throughout the study, circumstantial modal operators are most likely to be seen as event modifiers, while epistemic modal operators are operators which act on the clause level. Accordingly, the grammaticalisation of epistemic modality can be captured as a change from event modification to clausal modification. This confirms the

observation made by Abraham (1991), Abraham (2001) and Abraham (2005) and Leiss (2002), who argue that aspectual semantics of the embedded predicate play a crucial role in the grammaticalisation of epistemic modality. Moreover, it was demonstrated in Chapter 6 that epistemic modal verbs can still be considered elements of category 'verb'. Accordingly, the process of grammaticalisation under discussion can be considered as a development which does not affect the syntactic category of the underlying verb.

The essential clue for understanding this development is that circumstantial modal operators are capable of selecting stative predicates as long as they can be reinterpreted as events by means of a pragmatic repair mechanism. As long as language learners are able to detect this mechanism, the modal operators will be attributed a circumstantial interpretation. In some contexts, however, the communicative effect of a circumstantial modal operator and an epistemic one is almost identical. It can thus happen that the application of the repair mechanism becomes too opaque for the language learner. As a consequence, any learner would prefer an epistemic interpretation, which is the less complex alternative in this case.

8 Summary

This must be the end. Finally, all of the potential modal verbs in German have been discussed in some detail, considering the most important findings from several centuries of research and grounded on broad empirical data. The result is the first comprehensive corpus based description of the so-called *modal verbs* in German. The underlying corpus is the archive W of the DeReKo corpus, which was compiled at the *Institut für Deutsche Sprache* in Mannheim, and which encompassed about 2 billion word form tokens at the period when this research was carried out. In what follows, a short overview of the most important findings will be given.

In Chapter 2, it was suggested that there are two possibilities to define the individual class of modal verbs: a strong definition, which includes all possible uses of each individual modal verb lexeme, and a weak one, which only considers their epistemic interpretations. In the course of the study, it was shown that only the weak definition is plausible. The epistemic interpretations of each traditional modal verb behave in a fairly homogeneous way. As a consequence, they can be grouped into a class. By contrast, their circumstantial interpretations are very idiosyncratic. While it is possible to consider the circumstantial readings of single lexical items as a class, this approach would fail for the entire set of circumstantial modal verbs. As it is impossible to subsume the circumstantial modal verbs under a homogeneous class, the strong definition of modal verbs is not applicable to the traditional six elements in German. Using a weak definition of modal verbs, two further elements have to be integrated: *brauchen* and *werden*. Moreover, it has been shown that epistemic *dürfte* has to be regarded as an independent lexical item.

It was moreover shown in Section 2.3 that the contradictions originate in the terminology used. In the grammars of the 17th century, verbs with a preterite present inflection pattern were subsumed under a particular class. At that time, the motivation was a purely morphological one. Only in the 19th century did grammarians additionally try to provide a functional motivation for this class. Unfortunately, there was always a mismatch between those verbs with exceptional morphology, and those verbs with a remarkable function. Accordingly, early definitions which were only based on a single motivation result in a much more homogeneous class than ‘mixed’ definitions do.

Chapter 3 was dedicated to the examination of the nature of epistemic modality. Two characteristics were identified: firstly, epistemic modifiers are capable of modifying predications consisting of an identified individual, and a predicate which refers to a state that is not likely to change, or a predicate that refers to an

<https://doi.org/10.1515/9783110411027-008>

event in the past. Secondly, the use of an epistemic modifier indicates that the embedded proposition is not part of the deictic centre's knowledge.

Chapter 4 dealt with the environments from which epistemic modal verbs are banned. Among the 21 non-canonical environments which have been suggested in the literature, there are only eight in which epistemic modal verbs could not be found: (i) they do not occur with verbless directional phrase complements, (ii) they cannot be separated from their infinitive complements in *wh*-clefts, (iii) they do not undergo nominalisation, (iv) they are banned from adverbial infinitives, and they cannot be embedded under (v) circumstantial modal verbs, (vi) predicates of desire, (vii) imperative operators, or (viii) optative operators.

Furthermore, it was demonstrated in Section 4.22 that the distinction between subjective and objective epistemic modality is misleading, and that it cannot account for the distribution of epistemic modal verbs. In particular, the alleged characteristics of objective modality only apply to individual verbs, but never to all verbs which are considered as 'objective' epistemic. Most of these patterns can be treated more efficiently as ('subjective') epistemic instances, which exhibit verb-specific idiosyncrasies. The remaining cases are circumstantial modal verbs.

Moreover, there is compelling evidence that epistemic modal verbs should be analysed as a part of the proposition, as they contribute to the truth conditions, as pointed out in Section 4.23.

In Chapter 5, it was shown that reportative modal verbs are systematically more flexible with respect to the non-canonical environments discussed above. In contrast to their epistemic counterparts, reportative modal verbs are attested: in nominalisations (iii), in adverbial infinitives (iv), and embedded under tense auxiliaries (v) as well as optative operators (viii).

As demonstrated in Chapter 6, the behaviour of epistemic and reportative modal verbs can most efficiently be captured in terms of anchoring conditions regarding the deictic centre. These operators introduce variables for the deictic centre which have to be bound by an appropriate attitude holder. Generally, this variable will be anchored to the most local argument which can be interpreted as an attitude holder. In case there is none, it will be tied to the most salient referent of the speech act – otherwise the variable will be left uninstantiated. There are other operators, such as circumstantial modal operators or nominalisation operators, which fail to embed linguistic structures that contain a free variable for a deictic centre. As a consequence, epistemic modal verbs can be described as elements of the category 'verb' which introduce a variable for a deictic centre that needs to be identified. Thus, they need not be analysed as affix-like elements merged in a functional projection.

Subsequently, Chapter 7 provided a scenario which can explain how epistemic modal operators emerge. Being event modifiers, circumstantial modal

operators are restricted to the modification of events. Yet, they occasionally occur with stative predicates – as long as they can be reinterpreted as events by applying a pragmatic repair mechanism. If the application of this mechanism becomes too opaque, language learners are likely to reanalyse these modifiers as epistemic modal operators. This happens, in particular, in contexts where circumstantial and epistemic modal operators yield a similar communicative effect. As was seen in Chapter 6, epistemic modal verbs are elements of category V. Accordingly, the grammaticalisation of epistemic modal verbs can be considered as a process which leaves the syntactic category of the verb intact.

Considering the findings summarized above, we are finally in a position to answer the questions raised in Section 1.1:

What is the nature of modal verbs? As for German, the strong definition of modal verbs results in a very imprecise concept, which has no value for research. By contrast, the weak definition yields a homogeneous class which encompasses all epistemic modal verbs. Accordingly, it is recommended to either use the term *modal verb* with great care, or else abandon it.

What is the nature of epistemic modifiers? Epistemic modifiers are clausal modifiers which indicate that the embedded proposition is not part of the deictic centre's knowledge. Hence, they contribute to the truth conditions, as a deictic centre is required whose knowledge does not contain the embedded proposition.

What triggered grammaticalisation? In virtue of their nature as event modifiers, circumstantial modal verbs are restricted to the modification of events. Sometimes, however, they are combined with stative predicates which are interpreted as events by means of a pragmatic repair mechanism. As long as language learners are able to detect this repair mechanism, they will analyse the relevant patterns as circumstantial modification. As soon as the application of the repair mechanism becomes too opaque, the language learner will reinterpret them as instances of epistemic modification, which appears to be the less complex, and more plausible, configuration in this situation.

Primary sources

- Alexis, Willibald (1894). *Der Werwolf*. Berlin: Otto Janke.
- Ausführliche Arbeit von der Teutschen HauptSprache (1663). Braunschweig: Christoff Friedrich Zilligern.
- Berg, Franz (1793). *Predigten über die Pflichten der höheren und aufgeklärten Stände bey den bürgerlichen Unruhen unserer Zeit*. Wirzburg: Stahel.
- Bergius, Peter Jonas (1794). *Von Obstgärten und deren Beförderung in Schweden*. Leipzig: Gräffische Buchhandlung.
- Chomsky, Noam (2002). *Offene Wunde Nahost. Translated by Michael Haupt*. Hamburg: Europa Verlag.
- Cochläus (Vogelgesang), Johannes (1900). *Ein heimlich Gespraech von der Tragedia Johannis Hussen. Edited by Hugo Holstein*. Halle a. Saale: Max Niemeyer.
- Cramer, Johann Andreas (1758). *Der Nordische Aufseher*. Kopenhagen: Johann Benjamin Ackermann.
- Dostojewskij, Fjodor Michailowitsch (2003). *Aufzeichnungen aus dem Kellerloch. Translated by Svetlana Geier*. Frankfurt: Fischer.
- Dostojewskij, Fjodor Michailowitsch (2009). *Der Idiot. Translated by Svetlana Geier*. Frankfurt: Fischer.
- Eschenbach., Wolfram von (1998). *pärzival edited by Karl Lachmann*. 6th ed. De Gruyter.
- Fichte, Johann Gottlieb (1798). *Das System der Sittenlehre*. Vol. II. Leipzig: Meiner.
- Gellert, Christian Fürchtegott (1747a). 'Das Orakel'. In: *Lustspiele*. Leipzig: Johann Wendler.
- Gellert, Christian Fürchtegott (1747b). 'Die Betschwester'. In: *Lustspiele*. Leipzig: Johann Wendler.
- Gellert, Christian Fürchtegott (1747c). 'Die Zärtlichen Schwestern'. In: *Lustspiele*. Leipzig: Johann Wendler.
- Goethe, Johann Wolfgang von (1991). *Faust - der Tragödie erster Teil. Edited by Erich Trunz*. Beck.
- Gotter, Friedrich Wilhelm (1772). 'Elektra'. In: *Gedichte*. Vol. II. 45.
- Grimm, Jacob and Wilhelm Grimm (1837). 'Die zertanzten Schuhe'. In: *Kinder und Hausmärchen. Große Ausgabe*.
- Günther, Johann Christian (1720). 'Ode an Herrn Marckard von Riedenhausen Ivris Vtrivsqve Cvltor'. In: *Johann Christian Günther Werke*. Ed. by Reiner Bölhoff. Frankfurt: Deutscher Klassiker Verlag.
- Gustav, Hugo (1829). *Beyträge zur civilistischen Bücherkenntnis der letzten vierzig Jahre*. Berlin. August Mylius.
- Hauptmann, Gerhart (1906). 'Die Weber'. In: *Gesammelte Werke*. Berlin: Fischer.
- Heine, Heinrich (1828). 'Reise nach Italien, Abschnitt IV'. In: *Morgenblatt für gebildete Stände* 20.
- Hemmer, Johann Jakob (1769). *Abhandlung über die deutsche Sprache zum Nutzen der Pfalz*. Mannheim: Akademische Schriften.
- Heyse, Paul (1862). 'Auf der Alm'. In: *Neue Novellen*. Vol. 4. Berlin: Wilhelm Hertz.
- Jörg, Edmund and Franz Binder (1870). *Historisch-politische Blätter für das katholische Deutschland*. Vol. 26. München: Literarisch-Artistische Anstalt.

<https://doi.org/10.1515/9783110411027-009>

- Kafka, Franz. (1994). 'Die Verwandlung'. In: *Franz Kafka. Gesammelte Werke. Drucke zu Lebzeiten*. Ed. by Wolf Kittler, Hans-Gerd Koch and Gerhard Neumann. Frankfurt/Main: S. Fischer.
- Kleist, Heinrich von (1995). 'Der Zebrochene Krug'. In: *Sämtliche Werke*. Ed. by Roland Reuß and Peter Staengele. Stroemfeld/Roter Stern.
- Kramer, Matthias. (1702b). *Das herrlich-Grosse Teutsch-Italiänische Dictionarium*. Nürnberg: Johann Andrea Endters Söhne.
- Kraus, Karl (1925). *Die Fackel*. 2nd ed. München: Kösel Verlag.
- Kraus, Walther (1983). 'Das Gericht über Orest bei Aischylos'. In: *Festschrift Robert Muth*. Ed. by . Paul Händel. Innsbrucker Beiträge zur Kulturwissenschaft. Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck.
- Lenz, Jakob Michael Reinhold (1774). *Der Hofmeister*. Leipzig: Weygandsche Buchhandlung.
- Lessing, Gotthold Ephraim (1766). *Laokoon: oder über die Grenzen der Mahlerey und Poesie*. Christian Friedrich Voss.
- Lessing, Gotthold Ephraim (1767a). *Hamburgische Dramaturgie*. J.H. Cramer.
- Lessing, Gotthold Ephraim (1767b). 'Minna von Barnhelm'. In: *Lustspiele. Zweyter Theil*. Ed. by Gotthold Ephraim Lessing. Christian Friedrich Voß.
- Lessing, Gotthold Ephraim (1768). *Hamburgische Dramaturgie*. J.H. Cramer.
- Lohenstein, Daniel Casper von (2005a). *Agrippina*. Vol. 2. Sämtliche Werke. Historisch kritische Ausgabe edited by Lothar Mundt. Berlin: De Gruyter.
- Lohenstein, Daniel Casper von (2005b). *Epicharis*. Vol. 2. Sämtliche Werke. Historisch kritische Ausgabe edited by Lothar Mundt. Berlin: De Gruyter.
- Lohenstein, Daniel Casper von (2008). *Ibrahim Bassa*. Vol. 1. Sämtliche Werke. Historisch kritische Ausgabe edited by Lothar Mundt. Berlin: De Gruyter.
- Moscherosch, Johann Michael. (1640). *Alamodischer Politicus*. Cölln: Andreas Bingen.
- Moscherosch, Johann Michael. (1647). *Alamodischer Politicus*. Cölln: Andreas Bingen.
- Münchhausen, Otto Freiherr von (1771). *Monathliche Beschaeftigungen fuer einen Baum= und Plantagen=Gaertner*. Hannover.
- Palm, Kurt (2005). *Der Mozart ist fett und wohlauf*. Wien: Löcker.
- Rückert, Friedrich (1821). 'Nachklang'. In: *Morgenblatt für gebildete Stände*, 243.
- Schaidenreisser, Simon (1537). *Odyssea. Translation of Homer's epos*. Augsburg: Alexander Weissenhorn.
- Schiller, Friedrich von (1823). *Geschichte des dreissigjährigen kriegs, zweyter teil*. Vol. 54. Werke II. Carlsruhe: Bureau deutscher Klassiker.
- Schmid, Ulrich (1567). *Neuwe Welt*. Franckfurt am Mayn: Siegmund Feyrabend.
- Schulze, Ernst (1818). *Cäcilie*. Leipzig: Brockhaus.
- Schwaben, Johann Joachim (1751). *Herrn Johann Christoph Gottscheds Gedichte*. Leipzig: Breitkopf.
- Tatian* edited by Edmund Sievers (1961). 2nd ed. Darmstadt: Wissenschaftliche Buchgesellschaft.
- Ullmann, Carl (1829). *Theologische Studien und Kritiken*. Vol. II. 1. Hamburg: Friedrich Perthes.
- Verwandlungen. Translation of Ovid's Metamorphoses* (1798). Berlin: Friedrich Vieweg der Ältere.
- Vogelweide, Walter von der (1996). *Leich, Lieder, Sangsprüche*. Edited by Karl Lachmann. 14th ed. Berlin: De Gruyter.
- Voß, Johann Heinrich (1781). *Odyssee. Translation of Homer's epos*. Hamburg.
- Voß, Johann Heinrich (1793). *Illias. Translation of Homer's epos*. Hamburg.

Weinhold, Moritz, ed. (1862). *Achtundvierzig Briefe von Johann Gottlieb Fichte und seinen Verwandten*. Leipzig: Grunow.

Winkelmans, Johann (1764). *Geschichte der Kunst des Alterthums*. Dresden: bei Walther.

Zwengel, Johann Peter (1568). *New Groß Formular und vollkommlich Cantzlei Buch von den besten und außersenen Formularien aller deren Schrifften/ so in Chur und Fürstlichen / auch der Grauen / Herren unnd anderen fürnemen Cantzleyen / Auch sonst in den Ampten unnd Ampts händeln / Deßgleichen under dem gemeinenMan / allerley fürfallendert geschäft halben / brüchlich seindt – Reuerßbrieff vber bestandnen Bawhofs/sampt deren Güter*. Frankfurt: Egenolffs Erben.

References

- Abraham, Werner (1991). 'Modalverben in der Germania'. In: *Begegnung mit dem Fremden: Grenzen – Traditionen – Vergleiche. Akten des VIII. Internationalen Germanisten Kongress in Tokio*. Ed. by Eijiro Iwasaki. Vol. 4. München: iudicium, pp. 109–118.
- Abraham, Werner (2001). 'Modals: towards explaining the 'epistemic non-finiteness gap''. In: *Modalität und Modalverben im Deutschen*. Ed. by Reimar Müller and Marga Reis. Hamburg: Buske, pp. 7–36.
- Abraham, Werner (2002). 'Modal verbs: Epistemics in German and English'. In: *Modality and its interaction with the verbal system*. Ed. by Sjeff Barbiers, Frits Beukema and Wim van der Wurff. Vol. 47. Linguistik Aktuell. Amsterdam: Benjamins, pp. 19–50.
- Abraham, Werner (2003). 'Canonic and non-canonic deliberations about epistemic modality: its emergence out of where? On an extended notion of grammatic(al)ization'. In: *Germania et alia. A Linguistic Webschrift for Hans den Besten*. Ed. by Jan Koster and Henk van Riemsdijk. University of Amsterdam.
- Abraham, Werner (2004). 'The grammaticalization of the infinitival preposition - towards a theory of 'grammaticalizing reanalysis''. In: *Journal of Comparative Germanic Linguistics* 7.2, pp. 111–170.
- Abraham, Werner (2005). 'Event Arguments and modal verbs'. In: *Event Arguments: Foundations and Applications*. Ed. by Claudia Maienborn and Angelika Wöllstein. Vol. 501. Reihe Linguistische Arbeiten. Niemeyer, pp. 243–276.
- Abraham, Werner (2011). 'Traces of Bühler's semiotic legacy in modern linguistics'. In: *Theory of language*. Ed. by Karl Bühler. 2nd ed. Amsterdam: John Benjamins. Chap. Preface, pp. xiii–xlvii.
- Adelung, Johann Christoph (1782). *Umständliches Lehrgebäude der deutschen Sprache: zur Erläuterung der deutschen Sprache für Schulen*. Leipzig: Breitkopf.
- Adelung, Johann Christoph (1793). *Grammatisch-kritisches Wörterbuch der Hochdeutschen Mundart: A-E*. 2nd ed. Vol. 1. Leipzig: Breitkopf und Härtel.
- Adelung, Johann Christoph (1798). *Grammatisch-kritisches Wörterbuch der Hochdeutschen Mundart: M-Scr*. 2nd ed. Vol. 3. Leipzig: Breitkopf und Härtel.
- Adelung, Johann Christoph (1801). *Grammatisch-kritisches Wörterbuch der Hochdeutschen Mundart: Seb-Z*. 2nd ed. Vol. 4. Leipzig: Breitkopf und Härtel.
- Adéwólé, Fèmi (1990). 'Gbòdò 'must': analysis of a Yorùbá modal verb'. In: *Journal of West African Languages* 20.1, pp. 73–82.
- Adéwólé, Fèmi O. (1993). 'A semantic analysis of a Yorùbá modal verb'. In: *Ifè: Annals of the Institute of Cultural Studies* 4, pp. 37–45.
- Aijmer, Karin (1978). 'Epistemic modal auxiliaries in English'. In: *Papers from the fourth Scandinavian Conference of Linguistics*. Ed. by Kirstin Gregersen, Hans Basbøll and Jacob Mey. Odense, pp. 161–168.
- Alban, Doctor (1992). 'It's my lifè'. PhD thesis. Stockholm: Eurodance.
- Aldenhoff, Jules (1962). 'Der Ersatzinfinitiv im heutigen Deutschen'. In: *Revue des langues vivantes* 28, pp. 195–217.
- Allard, Francis X. (1975). *A structural and semantic analysis of the German modal 'mögen'*. Vol. 6. Stanford German studies. Frankfurt/Main: Peter Lang.
- Anand, Pranav and Valentine Hacquard (2013). 'Epistemics and attitudes'. In: *Semantics & Pragmatics* 6.8, pp. 1–59.

<https://doi.org/10.1515/9783110411027-010>

- Antomo, Mailin and Markus Steinbach (2010). 'Desintegration und Interpretation: Weil-V2-Sätze an der Schnittstelle zwischen Syntax, Semantik und Pragmatik'. In: *Zeitschrift für Sprachwissenschaft* 29.1, pp. 1–37.
- Asbach-Schnitker, Brigitte (1977). 'Die Satzpartikel "wohl"'. In: *Aspekte der Modalpartikel*. Ed. by Harald Weydt. Tübingen: Niemeyer, pp. 38–61.
- Askedal, John Ole (1989). 'Über den Infinitiv ohne bzw. mit "zu" im heutigen Deutsch: Klassenbildung regierender Lexeme und Hauptzüge der Distribution.' In: *Deutsch als Fremdsprache* 26.1,2, pp. 2–7, 103–105.
- Askedal, John Ole (1991). 'Ersatzinfinitiv/Partizipersatz und Verwandtes. Zum Aufbau des verbalen Schlussfeldes in der modernen deutschen Standardsprache'. In: 19, pp. 1–23.
- Askedal, John Ole (1997a). "'Brauchen' mit Infinitiv. Aspekte der Auxiliarisierung'. In: *Jahrbuch der ungarischen Germanistik*, pp. 53–68.
- Askedal, John Ole (1997b). "'drohen' und 'versprechen' als sogenannte Modalitätsverben in der deutschen Gegenwartssprache'. In: *Deutsch als Fremdsprache* 34, pp. 12–19.
- Askedal, John Ole (1998). 'Satzmustervariation und Hilfsverbproblematik beim deutschen Verb 'scheinen''. In: *Deutsche Grammatik - Thema in Variationen. Festschrift für Hans-Werner Eroms zum 60. Geburtstag*. Ed. by Karin Donhauser and Ludwig Eichinger. Heidelberg: Winter, pp. 49–74.
- Auwers, Johan van der, Andreas Ammann and Saskia Klindt (2005). 'Modal polyfunctionality and Standard Average European'. In: *Modality. Studies in Form and Function*. Ed. by Alex Klinge and Henrik Høeg Müller. London: Equinox, pp. 247–272.
- Axel, Katrin (2001). 'Althochdeutsche Modalverben als Anhebungsverben'. In: *Modalität und Modalverben im Deutschen*. Ed. by Marga Reis and Reimar Müller. Hamburg: Buske, pp. 37–60.
- Barbiers, Sjef (1995). 'The syntax of interpretation'. PhD thesis. Univeriteit Leiden.
- Barbiers, Sjef (2002). 'Modality and polarity'. In: *Modality and its interaction with the verbal system*. Ed. by Sjef Barbiers, Frits Beukema and Wim van der Wurff. Vol. 47. Linguistik Aktuell. Benjamins, pp. 51–73.
- Bartsch, Renate (1972). *Adverbialsemantik*. Frankfurt/Main: Athenäum.
- Basler, Otto (1935). *Der große Duden: Grammatik der deutschen Sprache; eine Anleitung zum Verständnis des Aufbaus unserer Muttersprache*. Zürich: Fretz & Wasmuth.
- Bauer, Friedrich (1850). *Grundzüge der Neuhochdeutschen Grammatik für die unteren und mittleren Klassen höherer Bildungsanstalten*. Nördlingen: C.H. Beck.
- Bauer, Friedrich (1870). *Grundzüge der Neuhochdeutschen Grammatik für die unteren und mittleren Klassen höherer Bildungsanstalten*. 12th ed. Nördlingen: C.H. Beck.
- Bauer, Friedrich and Konrad Duden (1887). *Grundzüge der Neuhochdeutschen Grammatik für höherer Bildungsanstalten und zur Selbstbelehrung für Gebildete*. 20th ed. Nördlingen: C.H. Beck.
- Bauer, Heinrich (1827). *Vollständige Grammatik der neuhochdeutschen Sprache*. Vol. 1. Berlin: G. Reimer.
- Bauer, Heinrich (1832). *Vollständige Grammatik der neuhochdeutschen Sprache*. Vol. 4. Berlin: G. Reimer.
- Bech, Gunnar (1949). 'Das Semantische System der Modalverben'. In: *Travaux du Cercle Linguistique de Copenhague* VI, pp. 3–46.
- Bech, Gunnar (1951). *Grundzüge der semantischen Entwicklungsgeschichte der hochdeutschen Modalverba*. Vol. 6. Historisk-filologiske meddelelser 32. Copenhagen: Munksgaard.

- Bech, Gunnar (1955). *Studien über das deutsche Verbum infinitum*. Vol. 35-36. Historiskfilologiske Meddelelser 2/6. Copenhagen: Munksgaard.
- Bech, Gunnar (1963). 'Grammatische Gesetze im Widerspruch'. In: *Lingua* 12, pp. 291–299.
- Becker, Karl Ferdinand (1836). *Ausführliche deutsche Grammatik als Kommentar der Schulgrammatik*. 2nd ed. Vol. 1. Frankfurt am Main: G. F. Kettembeil.
- Becker, Karl Ferdinand (1841). *Organism der Sprache*. 2nd ed. Frankfurt/Main: Kettembeil.
- Becker, Karl Ferdinand (1842). *Ausführliche deutsche Grammatik als Kommentar der Schulgrammatik*. revised 2. Vol. 1. Frankfurt am Main: G. F. Kettembeil.
- Behaghel, Otto (1924). *Deutsche Syntax II: die Wortklassen und Wortformen B/C. Adverbium. Verbum*. Heidelberg: Winter.
- Beringer, Nicole. 'The use of German 'braucht' in unscripted speech: morphological reduction or phonetically caused Elision'.
- Bhatt, Rajesh and Roumyana Pancheva (2006). 'Conditionals'. In: *The Blackwell Companion to Syntax*. Ed. by Martin Everaert and Henk R. van Riemsdijk. Oxford: Blackwell, pp. 638–687.
- Bildhauer, Felix (2011). 'Mehrfache Vorfelddbesetzung und Informationsstruktur: eine Bestandesaufnahme'. In: *Deutsche Sprache* 11.4, pp. 362–372.
- Birkmann, Thomas (1987). *Präteritopräsentia: morphologische Entwicklung einer Sonderklasse in den altgermanischen Sprachen*. Vol. 188. Linguistische Arbeiten. Tübingen: Niemeyer.
- Blatz, Friedrich (1880). *Neuhochdeutsche Grammatik mit Berücksichtigung der historischen Entwicklung der deutschen Sprache*. 2nd ed. Tauberbischofsheim: Lang.
- Blatz, Friedrich (1896). *Neuhochdeutsche Grammatik mit Berücksichtigung der historischen Entwicklung der deutschen Sprache*. 3rd ed. Vol. 2. Karlsruhe: Lang.
- Blatz, Friedrich (1900). *Neuhochdeutsche Grammatik mit Berücksichtigung der historischen Entwicklung der deutschen Sprache*. 3rd ed. Vol. 2. Karlsruhe: Lang.
- Bloch, Oscar and Walther von Wartburg (1986). *Dictionnaire étymologique de la langue française*. 7th ed. Paris: Presses Universitaires de France.
- Blühdorn, Hardarik (2012). *Negation im Deutschen. Syntax, Informationsstruktur, Semantik*. Vol. 48. Studien zur deutschen Sprache. Tübingen: Narr.
- Bödiker, Johann (1698). *Grundsätze der deutschen Sprachen im Reden und Schreiben: samt einen Bericht vom rechten Gebrauch der Vorwörter, der studierenden Jugend und allen Deutschliebenden zum Besten vorgestellt*. Berlin: Meyers Erben u. Zimmermann.
- Bolkestein, Machtelt A. (1980). *Problems in the description of modal verbs: an investigation of Latin*. Assen: Van Gorcum.
- Boye, Kasper (2010). 'Raising verbs and auxiliaries in a functional theory of grammatical status'. In: *Language usage and language structure*. Ed. by Kasper Boye and Elisabeth Engberg-Pedersen. Berlin: Mouton de Gruyter.
- Braune, Wilhelm (1886). *Althochdeutsche Grammatik*. Halle: Niemeyer.
- Braune, Wilhelm and Ingo Reiffenstein (2004). *Althochdeutsche Grammatik. Laut und Formenlehre*. 15th ed. Tübingen: Niemeyer.
- Brennan, Virginia (1993). 'Root and Epistemic Modal Auxiliary Verbs in English'. PhD thesis. Amherst: University of Massachusetts.
- Brennan, Virginia (1997). 'Quantificational Modals'. In: *Linguistic Inquiry* 1.28, pp. 165–170.
- Bres, Jacques and Emanuelle Labeau (2012). 'De la grammaticalisation des formes itive ('aller') et ventive ('venir'): valeur en langue, emplois en discours'. In: *Etudes de sémantique et pragmatique françaises*. Ed. by Louis de Saussure and Alain Rihs. Bern: Lang, pp. 143–166.

- Brinkmann, Hennig (1962). *Die deutsche Sprache. Gestalt und Leistung*. Düsseldorf: Schwann.
- Brünner, Gisela (1979). 'Modales 'nicht-brauchen' und 'nicht-müssen''. In: *Linguistische Berichte* 62, pp. 81–93.
- Brünner, Gisela and Angelika Redder (1983). *Studien zur Verwendung der Modalverben*. Studien zur deutschen Grammatik 19. Tübingen: Narr.
- Bühler, Karl (1934). *Sprachtheorie*. Jena: Fischer.
- Buscha, Joachim, Gertraud Heinrich and Irene Zoch (1971). *Modalverben*. Leipzig: Enzyklopaedie Verlag.
- Butler, Jonny (2003). 'A minimalist treatment of modality'. In: *Lingua* 113, pp. 967–996.
- Butt, Miriam (2006). *Theories of Case*. Cambridge: University Press.
- Bybee, Joan, Revere Dale Perkins and William Pagliuca (1994). *The evolution of grammar*. Chicago: University of Chicago Press.
- Calbert, Joseph P (1975). 'Toward the Semantics of Modality'. In: *Aspekte der Modalität*. Ed. by Joseph P. Calbert and Heinz Vater. Vol. 1. Studien zur deutschen Grammatik. Narr, pp. 1–70.
- Carlson, Gregory N. (1977). 'Reference to kinds in English'. PhD thesis. Amherst: University of Massachusetts.
- Carpenter, Bob (1998). *Type logical semantics*. Cambridge, Mass: MIT press.
- Chomsky, Noam (1981). *Lectures on government and binding: the Pisa lectures*. Studies in generative grammar 9. Berlin: Mouton de Gruyter.
- Cinque, Guglielmo (1999). *Adverbs and functional heads: a cross-linguistic perspective*. Oxford studies in comparative syntax. New York: Oxford University Press.
- Claius, Johannes (1578). *Grammatica Germanicae Lingvae ex bibliis Lutheris germanicis et aliis eius libris colecta*. Leipzig.
- Clément, Danièle (1986). 'A propos de faux vides et de faux PRO: les sujets des infinitives del'allemand introduites par 'um'-'zu' sont-ils contrôlés?' In: *Revue de linguistique* 34–35, pp. 257–273.
- Clément, Danièle and Wolfgang Thümmel (1975). *Grundzüge einer Syntax der deutschen Standardsprache*. Frankfurt/Main: Athenäum Fischer.
- Coates, Jennifer (1983). *The semantics of modal auxiliaries*. London: Croom Helm.
- Cohen, Ariel (2010). *Epistemic modals as speech act modifiers*. Talk given at the ZAS Berlin, November 2010.
- Colomo, Katarina (2011). *Modalität im Verbalkomplex. Halbmodalverben und Modalitätsverben im System statusregierender Verbklassen*. Vol. 6. Bochumer Linguistische Arbeitsberichte. Bochum: Ruhr Universität Bochum.
- Comrie, Bernard (1989). 'On identifying future tenses'. In: *Tempus – Modus – Aspekt. Die lexikalischen und grammatischen Formen in den germanischen Sprachen*. Ed. by Werner Abraham. Vol. 237. Linguistische Arbeiten. Tübingen: Niemeyer, pp. 51–64.
- Condoravdi, Cleo (2002). 'Temporal interpretation of modals: modals for the present and modals for the past'. In: *The construction of meaning*. Ed. by David Beaver et al. Stanford: CSLI Publications, pp. 59–87.
- Coniglio, Marco (2008). 'Die Syntax der deutschen Modalpartikeln: ihre Distribution und Lizenzierung in Haupt und Nebensätzen'. PhD thesis. Università Ca' Foscari Venezia.
- Copley, Bridget (2006). 'What should 'should' mean?' CNRS/Université Paris VIII.
- Cornillie, Bert (2007). *Evidentiality and epistemic modality in Spanish (semi-)auxiliaries: a cognitive-functional approach*. Vol. 5. Application of cognitive linguistics. Berlin: de Gruyter.

- Cornillie, Bert et al. (2009). 'Modals in the Romance Languages'. In: *Modals in the languages of Europe*. Ed. by Björn Hansen and Ferdinand de Haan. Vol. 44. Empirical Approaches to Language Typology. Berlin: De Gruyter, pp. 107–138.
- Curme, George O. (1922). *A grammar of the German language*. New York: Frederick Ungar Publishing CO.
- Curme, George O. (1931). *A grammar of the English language*. Vol. 2 Syntax.
- Dal, Ingerid (1952). *Kurze deutsche Syntax*. Tübingen: Niemeyer.
- De Haan, Ferdinand (1997). *The interaction of modality and negation: a typological study*. New York: Garland.
- Declerck, Renaat and Susan Reed (2001). *Conditionals. A Comprehensive empirical analysis*. Vol. 37. Topics in English Linguistics. Mouton de Gruyter.
- Demirdache, Hamida and Myriam Uribe-Etxebarria (2008). 'Scope and anaphora with time arguments: The case of 'perfect modals''. In: *Lingua* 118, pp. 1790–1815.
- Demske, Ulrike (2001). 'Zur Distribution von Infinitivkomplementen im Althochdeutschen'. In: *Modalität und Modalverben im Deutschen*. Ed. by Marga Reis and Reimar Müller. Hamburg: Buske, pp. 61–85.
- Denison, David (1993). *English Historical Syntax*. London: Longman.
- Depraetere, Ilse and An Verhulst (2008). 'Source of modality: a reassessment'. In: *English Language and Linguistics* 12.1, pp. 1–25.
- Diesing, Molly (1992). *Indefinites*. Linguistic Inquiry Monographs 20. Cambridge, MA: MIT Press.
- Dietrich, Rainer (1992). *Modalität im Deutschen. Zur Theorie der relativen Modalität*. Opladen: Westdeutscher Verlag.
- Diewald, Gabriele (1999). *Die Modalverben im Deutschen: Grammatikalisierung und Polyfunktionalität*. Reihe Germanistische Linguistik 208. Tübingen: Niemeyer.
- Diewald, Gabriele (2001). "'Scheinen'-Probleme: Analogie, Konstruktionsmischung und die Sogwirkung aktiver Grammatikalisierungskanäle'. In: *Modalität und Modalverben im Deutschen*. Ed. by Reimar Müller and Marga Reis. Hamburg: Buske, pp. 87–110.
- Diewald, Gabriele and Elena Smirnova (2010). *Evidentiality in German: linguistic realization and regularities in grammaticalization*. Vol. 228. Trends in linguistics. Berlin: Mouton de Gruyter.
- Dik, Simon C. (1975). 'The semantic representation of manner adverbials'. In: *Linguistics in the Netherlands 1972–1973*. Ed. by A Kraak. Assen: Van Gorcum, pp. 96–121.
- Doherty, Monika (1985). *Epistemische Bedeutung*. Vol. 23. Studia grammatica. Berlin: Akademie Verlag.
- Doitchinov, Serge (2001). 'Es kann sein, daß der Junge ins Hausgegangen ist' - Zum Erstspracherwerb von 'können' in epistemischer Lesart.' In: *Modalität und Modalverben im Deutschen*. Ed. by Reimar Müller and Marga Reis. Hamburg: Buske, pp. 111–134.
- Dougherty, Ray C. (1970). 'A grammar of coördinate conjoined structures I'. In: *Language* 46.4, pp. 850–898.
- Dowty, David (1991). 'Thematic proto-roles and argument selection'. In: *Language* 67, pp. 547–619.
- Drosdowski, Günther et al. (1984). *Duden: Grammatik der deutschen Gegenwartssprache*. 4th ed. Vol. 4. Der Duden. kAb 1800/4/4 ==> (Phil). Mannheim: Dudenverlag.
- Drosdowski, Günther et al. (1995). *Duden: Grammatik der deutschen Gegenwartssprache*. 5th ed. Vol. 4. Der Duden. Mannheim: Dudenverlag.

- Drubig, Hans Bernhard (2001). 'On the syntactic form of epistemic modality'. Ms. Universität Tübingen.
- Ebert, Robert Peter (1976). *Infinitival Constructions in Early New High German*. Linguistische Arbeiten 30. Tübingen: Niemeyer.
- Ebert, Robert Peter et al. (1993). *Frühneuhochdeutsche Grammatik*. Tübingen: Niemeyer.
- Ehlich, Konrad and Jochen Rehbein (1972). 'Einige Interrelationen von Modalverben'. In: *Linguistische Pragmatik*. Ed. by Dieter Wunderlich. Frankfurt am Main: Athenäum, pp. 318–340.
- Ehrich, Veronika (2001). 'Was 'nicht müssen' und 'nicht können' (nicht) bedeuten können: zum Skopus der Negation bei den Modalverben des Deutschen.' In: *Modalität und Modalverben im Deutschen*. Ed. by Marga Reis and Reimar Müller. Hamburg: Buske, pp. 149–176.
- Eide, Kristin Melum (2005). *Norwegian Modals*. Studies in Generative Grammar 74. Berlin: Mouton de Gruyter.
- Eisenberg, Peter (1992). 'Adverbiale Infinitive: Abgrenzung, Grammatikalisierung, Bedeutung'. In: *Deutsche Syntax. Ansichten und Aussichten*. Ed. by Ludger Hoffmann. Berlin, pp. 206–224.
- Eisenberg, Peter (2004). *Grundriß der deutschen Grammatik*. 2. Auflage. Vol. 2. Stuttgart: Metzler.
- Eisenberg, Peter et al. (2005). *Duden, die Grammatik: unentbehrlich für richtiges Deutsch*. Ed. by Kathrin Kunkel-Razum. 7th ed. Vol. 4. Der Duden. Mannheim: Dudenverlag.
- Enç, Mürvet (1996). 'Tense and Modality'. In: *The Handbook of Contemporary Semantic Theory*. Ed. by Shalom Lappin. Oxford: Blackwell, pp. 345–358.
- Engel, Ulrich (1991). *Deutsche Grammatik*. 2. verbesserte Auflage. Heidelberg: Groos.
- Engel, Ulrich (1996). *Deutsche Grammatik*. 3rd ed. Heidelberg: Groos.
- Erb, Marie Christine (2001). 'Finite Auxiliaries in German'. PhD thesis. Katholieke Universiteit Brabant.
- Eroms, Hans-Werner (1980). 'Funktionskonstanz und Systemstabilisierung bei den begründenden Konjunktionen im Deutschen'. In: *Sprachwissenschaft* 5, pp. 73–115.
- Fabricius-Hansen, Cathrine (1980). 'Sogenannte ergänzende 'wenn'-Sätze. Ein Beispiel zu syntaktisch- semantischer Argumentation'. In: *Festschrift für Gunnar Bech zum 60. Geburtstag*, pp. 160–188.
- Fabricius-Hansen, Cathrine (1999). "'Moody Time': Indikativ und Konjunktiv im deutschen Tempussystem'. In: *Zeitschrift für Sprachwissenschaft und Linguistik* 29.13, pp. 119–146.
- Fabricius-Hansen, Cathrine (2000). 'Die Geheimnisse der deutschen 'würde'-Konstruktion'. In: *Deutsche Grammatik in Theorie und Praxis*. Ed. by Rolf Thieroff. Tübingen, pp. 183–196.
- Fabricius-Hansen, Cathrine and Kjell Johan Sæbø (1983). 'Über das Chamäleon 'wenn' und seine Umwelt'. In: *Linguistische Berichte* 83, pp. 1–35.
- Fagan, Sarah M. B. (2001). 'Epistemic Modality and Tense in German'. In: *Journal of Germanic Linguistics* 13.3, pp. 197–230.
- Faller, Martina (2010). 'A possible worlds semantics for Cuzco Quechua evidentials'. In: *Proceedings of SALT 20, 29 Apr 2010-01 May 2010, Vancouver*. Ed. by Nan Li and David Lutz, pp. 660–683.
- Faller, Martina (2011). *Reportative evidentials and modal subordination*. Talk given at the CHRONOS 2011, Aston University Birmingham.
- Faller, Martina (2012). 'Evidential scalar implicatures'. In: *Linguistics and Philosophy* 35, pp. 285–312.

- Feldman, Fred (1986). *Doing the best we can: an essay in informal deontic logic*. Vol. 35. Philosophical studies series in philosophy. Dordrecht: Reidel.
- Fillmore, Charles J. (1997). 'Lectures on deixis'. In: Stanford, Calif.: Center for the Study of Language and Information. Chap. Coming and Going, pp. 77–102.
- Fintel, Kai von and Anthony S. Gillies (2008). 'CIA Leaks'. In: *Philosophical Review* 1.117, pp. 77–98.
- Fintel, Kai von and Anthony S. Gillies (2010). 'Must...Stay...Strong!' In: *Natural Language Semantics* 18.4, pp. 351–383.
- Fintel, Kai von and Anthony S. Gillies (2011). '“Might” made right'. In: *Epistemic modality*. Ed. by Andy Egan and Brian Weatherston. Oxford: Oxford University Press, pp. 108–130.
- Fintel, Kai von and Sabine Iatridou (2003). 'Epistemic containment'. In: *Linguistic Inquiry* 2.34, pp. 173–198.
- Fleischer, Jürg and Oliver Schallert (2011). *Historische Syntax des Deutschen*. Narr Studienbücher. Tübingen: Narr.
- Folsom, Marvin H. (1968). 'Brauchen' im System der Modalverben'. In: *Muttersprache* 78, pp. 321–329.
- Fourquet, Jean (1970). 'Zum subjektiven Gebrauch der deutschen Modalverben'. In: *Studien zur Syntax des heutigen Deutsch, Paul Grebe zum 60. Geburtstag*. Vol. VI. Sprache der Gegenwart. Düsseldorf: Schwann, pp. 154–161.
- Freywald, Ulrike (2010). "Obwohl vielleicht war es ganz anders". Vorüberlegungen zum Alter der Verbzweitstellung nach subordinierenden Konjunktionen'. In: *Historische Textgrammatik und historische Syntax des Deutschen*. Ed. by Arne Ziegler. Berlin: De Gruyter, pp. 54–84.
- Fritz, Gerd (1991). 'Deutsche Modalverben 1609 - epistemische Verwendungsweisen'. In: *Beiträge zur Geschichte der deutschen Sprache und Literatur* 113, pp. 28–53.
- Fritz, Gerd (1997). 'Historische Semantik der Modalverben'. In: *Untersuchungen zur semantischen Entwicklungsgeschichte der Modalverben im Deutschen*. Ed. by Gerd Fritz and Thomas Gloning. Reihe Germanistische Linguistik 187. Tübingen: Niemeyer, pp. 1–157.
- Gamon, David (1993). 'On the development of epistemicity in the German modalverbs 'mögen' and 'müssen''. In: *Folia Linguistica Historica* 14, pp. 125–176.
- Gazdar, Gerald (1981). 'Unbounded Dependencies and Coordinate Structure'. In: *Linguistic Inquiry* 12, pp. 155–184.
- Geilfuß, Jochen (1992). 'Ist 'wollen' ein Kontrollverb oder nicht?' In: *Arbeitspapiere des SFB* 340.
- Gelhaus, Hermann (1969). 'Strukturanalyse und Statistik - Über den Widerstreit zweier Kriterien'. In: *Wirkendes Wort* 19, pp. 310–324.
- Gergel, Remus and Jutta Hartmann (2009). 'Experiencers with (un)-willingness'. In: *Advances in comparative germanic syntax*. Ed. by Artemis Alexiadou et al. Vol. 141. Linguistik Aktuell. Amsterdam: John Benjamins, pp. 327–355.
- Geuder, Wilhelm (2006). 'Manner modification of states'. In: *Proceedings of Sinn und Bedeutung*. Ed. by Christian Ebert and Cornelia Endriss. ZAS Papers in Linguistics. Berlin: ZAS, pp. 111–124.
- Ginzburg, Jonathan (2012). *The interactive stance: meaning for conversation*. Oxford University Press.
- Girnth, Heiko (2000). *Untersuchungen zur Theorie der Grammatikalisierung am Beispiel des Westmitteldeutschen*. Vol. 223. Reihe germanistische Linguistik. Tübingen: Niemeyer.

- Glas, Reinhold (1984). 'sollen' im heutigen Deutsch. *Bedeutung und Gebrauch in der Schriftsprache*. Studien zur deutschen Grammatik 27. Tübingen: Narr.
- Götzke, Alfred and Walther Mitka (1939). *Trübners deutsches Wörterbuch. A-B*. Vol. 1. Berlin: de Gruyter.
- Grebe, Paul (1959). *Duden: Grammatik der deutschen Gegenwartssprache*. 1st ed. Vol. 4. Der große Duden. Mannheim: Dudenverlag.
- Grebe, Paul et al. (1966). *Duden: Grammatik der deutschen Gegenwartssprache*. 2nd ed. Vol. 4. Der große Duden. dk 1236-4 <2> ==> (Phil), Spr 7 b-dud 2.A. b ==> (ErzPsy). Mannheim: Dudenverlag.
- Grebe, Paul et al. (1973). *Duden: Grammatik der deutschen Gegenwartssprache*. 3rd ed. Vol. 4. Der große Duden. spr 7 b-dud 3.A. ==> (ErzPsy). Mannheim: Dudenverlag.
- Grice, Paul (1989). *Studies in the way of words*. Cambridge, Mass.: Harvard University Press.
- Gries, Stefan Th. and Anatol Stefanowitsch (2004). 'Extending collostructional analysis'. In: *International Journal of Corpus Linguistics* 9.1, pp. 97–129.
- Griesbach, Heinz and Dora Schulz (1960). *Grammatik der deutschen Sprache*. Hueber.
- Griesbach, Heinz and Dora Schulz (1976). *Grammatik der deutschen Sprache*. 10th ed. Hueber.
- Grimm, Jacob (1822). *Deutsche Grammatik I*. Göttingen: Dieterich.
- Grimm, Jacob (1837). *Deutsche Grammatik IV*. Göttingen: Dietrich.
- Grimm, Jacob and Wilhelm Grimm (1860). *Deutsches Wörterbuch*. Vol. 2. Leipzig: Hirzel.
- Grosz, Patrick (2014). 'Modal particles in rationale clauses and related constructions'. In: *Modes of Modality*. Ed. by Elisabeth Leiss and Werner Abraham. Vol. 149. Studies in language companion series. Amsterdam: John Benjamins, pp. 263–290.
- Gunlogson, Christine (2001). 'True to form: rising and falling declaratives as questions in English'. PhD thesis. Santa Cruz: University of California.
- Günthner, Susanne (1996). 'From subordination to coordination?: verb second position in German causal and concessive constructions'. In: *Pragmatics* 6.3, pp. 323–370.
- Günthner, Susanne (1999). 'Entwickelt sich der Konzessivkonjektor obwohl zum Diskursmarker? Grammatikalisierungstendenzen im gesprochenen Deutsch.' In: *Linguistische Berichte* 180, pp. 409–446.
- Günthner, Susanne (2000a). 'From concessive connector to discourse marker: The use of 'obwohl' in everyday German Interaction'. In: *Cause, Condition, Concession, Contrast. Cognitive and Discourse Perspectives*. Ed. by Elizabeth Couper-Kuhlen and Bernd Kortmann. Berlin: de Gruyter, pp. 439–486.
- Günthner, Susanne (2000b). 'wobei (.) es hat alles immer zwei seiten.' Zur Verwendung von 'wobei' im gesprochenen Deutsch'. In: *Deutsche Sprache* 28.4, pp. 313–341.
- Günthner, Susanne (2002). 'Zum kausalen und konzessiven Gebrauch des Konnektors 'wo' im gesprochenen Umgangsdeutsch'. In: 30.3, pp. 310–341.
- Günthner, Susanne (2008). 'weil - es ist zu spät' Geht die Nebensatzstellung im Deutschen verloren?' In: *Frischwärts und Unkaputtbar. Sprachverfall und Sprachwandel im Deutschen?* Ed. by Markus Denkler, Susanne Günthner and Wolfgang Imo. Aschendorff, pp. 103–128.
- Hacquard, Valentine (2006). 'Aspects of Modality'. PhD thesis. MIT.
- Hacquard, Valentine (2010). 'On the event relativity of modal auxiliaries'. In: *Natural Language Semantics* 18, pp. 17–114.
- Hacquard, Valentine and Alexis Wellwood (2012). 'Embedding epistemic modals in English. A corpus-based study'. In: *Semantics & Pragmatics* 5.4, pp. 1–29.
- Haegeman, Liliane (2002). 'Anchoring to speaker, adverbial clauses and the structure of CP'. In: *Georgetown University Working Papers in Theoretical Linguistics* 2, pp. 117–180.

- Haegeman, Liliane (2004). 'Topicalization, CLLD and the Left Periphery'. In: *ZAS Papers in Linguistics* 35, pp. 157–192.
- Haegeman, Liliane (2006). 'Conditionals, factives and the left periphery'. In: *Lingua* 116, pp. 1651–1669.
- Haider, Hubert (1993). *Deutsche Syntax – generativ*. Vol. 325. Tübinger Beiträge zur Linguistik. Tübingen: Narr.
- Haider, Hubert (2010). *The Syntax of German*. Cambridge Sytax Guides. Cambridge: Cambridge University Press.
- Hansen, Björn and Ferdinand De Haan (2009). *Modals in the languages of Europe: a reference work*. Vol. 44. Empirical Approaches to Language Typology. Berlin: Mouton de Gruyter.
- Heim, Irene (1982). 'The semantics of definite and indefinite noun phrases'. PhD thesis.
- Heine, Bernd (1995). 'Agent-oriented vs. Epistemic Modality. Some Observations on German Modals'. In: *Modality in Grammar and Discourse*. Ed. by Joan Bybee and Suzanne Fleischmann. Vol. 32. Typological Studies in Language. John Benjamins, pp. 17–53.
- Helbig, Gerhard and Joachim Buscha (2001). *Deutsche Grammatik: ein Handbuch für den Ausländerunterricht*. Berlin: Langenscheidt.
- Helbig, Gerhard and Agnes Helbig (1990). *Lexikon deutscher Modalwörter*. Leipzig: Enzyklopädie Verlag.
- Hengeveld, Kees (1988). 'Illocution, mood and modality in a functional grammar of Spanish'. In: *Journal of Semantics* 6, pp. 227–269.
- Hetland, Jorunn and Heinz Vater (2008). 'Zur Syntax der Modalverben im Deutschen und Norwegischen'. In: *Modalität und Grammatikalisierung*. Ed. by Eva Maagerø, Ole Letnes and Heinz Vater. Vol. 34. Fokus. Trier: Wissenschaftlicher Verlag, pp. 91–116.
- Heyse, Johann Christian August (1822). *Theoretisch=praktische deutsche Grammatik oder Lehrbuch zum reinen und richtigen Sprechen, Lesen und Schreiben der deutschen Sprache*. 3rd ed. Hannover: Hahn'sche Hof=Buchhandlung.
- Hill, Virginia (2011). 'Modal grammaticalization and the pragmatic field'. In: *Diachronica* 28.1, pp. 25–53.
- Hinterhölzl, Roland (2009). 'The IPP-effect, phrasal affixes and repair strategies in the syntax morphology interface'. In: *Linguistische Berichte* 218, pp. 191–216.
- Hinterwimmer, Stefan (2014). *The semantics of 'sollen'*. Talk given at Universität Tübingen.
- Hofmann, Thomas Ronald (1976). 'Past Tense Replacement and the Modal System'. In: *Notes from the Linguistic Underground*. Ed. by James McCawley. Syntax and semantics 7. New York: Academic Press, pp. 86–99.
- Höhle, Tilman N. (1978). *Lexikalistische Syntax. Die Aktiv-Passiv-Relation und andere Infinitivkonstruktionen im Deutschen*. Vol. 67. Linguistische Arbeiten. Niemeyer.
- Höhle, Tilman N. (1982). 'Explikation für "normale Betonung" und "normale Wortstellung"'. In: *Satzglieder im Deutschen*. Ed. by Werner Abraham. Studien zur deutschen Grammatik 15. Tübingen: Narr, pp. 75–153.
- Höhle, Tilman (1992). 'Über Verum-Fokus im Deutschen'. In: *Informationsstruktur und Grammatik*. Ed. by Joachim Jacobs. Linguistische Berichte Sonderheft 4/1991–1992. Opladen: Westdeutscher Verlag, pp. 112–141.
- Holler, Anke (2009). 'Towards an analysis of the adverbial use of German interrogative 'was' ('what')'. In: *Proceedings of the HPSG09 Conference, Georg-August-Universität Göttingen*. Ed. by Stefan Müller. 131–149. Stanford: CSLI Publications.
- Homer, Vincent (2010). 'Epistemic Modals: High ma non troppo'. In: *Proceedings of the 40th Meeting of the North East Linguistic Society*. Amherst, MA.

- Hornstein, Norbert (2003). 'On Control'. In: *Minimalist Syntax*. Ed. by Randall Hendricks. Malden: Blackwell, pp. 6–81.
- Huitink, Janneke (2008). 'Scoping over epistemics in English and in Dutch'. In: *Collection of the papers selected from the CIL held at Korea University in Seoul, Linguistic Society of Korea*, pp. 2077–2089.
- Jackendoff, Ray (1972). *Semantic interpretation in generative grammar*. Vol. 2. Studies in linguistics series. Cambridge, MA: MIT Press.
- Jackendoff, Ray (1977). *X-syntax: a study of phrase structure*. Cambridge, Mass: MIT Press.
- Jacobs, Joachim (1988). 'Fokus-Hintergrund-Gliederung und Grammatik'. In: *Intonationsforschung*. Ed. by Hans Altmann. Linguistische Arbeiten 200. Niemeyer, pp. 89–134.
- Jäger, Agnes (2010). 'Der Komparativzyklus und die Position der Vergleichspartikel'. In: *Linguistische Berichte* 224, pp. 467–493.
- Jäger, Gerhard (2001). 'Topic-comment structure and the contrast between stage level and individual level predicates'. In: *Journal of Semantics* 18, pp. 83–126.
- Jäger, Siegfried (1968). 'Ist 'brauchen' mit 'zu' nicht sprachgerecht?' In: *Muttersprache* 78, pp. 330–333.
- Jelinek, Max Hermann (1914). *Geschichte der neuhochdeutschen Grammatik von den Anfängen bis auf Adelung*. Heidelberg: Winter.
- Jespersen, Otto (1917). *Negation in English and other languages*. Vol. 1. Historisk-filologiske meddelelser 5. Hoest.
- Jespersen, Otto (1931). *A Modern English Grammar. Syntax. Third volume. Time and Tense*. Heidelberg: Carl Winter.
- Jędrzejowski, Łukasz (2010). 'Zur epistemischen Infinitivlücke aus diachroner und typologischer Sicht'. MA thesis. Freie Universität Berlin.
- Johnen, Thomas (2003). *Die Modalverben des Portugiesischen (PB und PE). Semantik und Pragmatik in der Verortung einer kommunikativen Grammatik*. Hamburg: Dr. Kovac.
- Johnen, Thomas (2006). 'Zur Herausbildung der Kategorie 'Modalverb' in der Grammatikographie des Deutschen'. In: *Pandaemonium germanicum* 10, pp. 283–338.
- Kaeding, Friedrich Wilhelm (1897). *Die Hilfszeitwörter in ihrem Verhältnis zum deutschen Wortschatz*. Berlin Steglitz: Selbstverlag.
- Kaiaty, Mohamed (2010). 'Überlegungen zu sog. 'ergänzenden 'wenn'-Sätzen' im Deutschen'. In: *Deutsche Sprache* 38.4, pp. 287–308.
- Kaita, Kousuke (2012). 'Modal auxiliaries from Late Old to Early Middle English'. PhD thesis. München: Ludwig Maximilians Universität.
- Kasper, Walter (1987). *Semantik des Konjunktivs II in Deklarativsätzen des Deutschen*. Vol. 71. Reihe germanistische Linguistik. Tübingen: Niemeyer.
- Kiaulehn, Walther (1965). *Der richtige Berliner in Wörtern und Redensarten*. Ed. by Hans Meyer. 10th ed. München: Biederstein.
- Kiefer, Ferenc (1984). 'Focus and modality'. In: *Groninger Abreiten zur Germanistischen Linguistik* 24, pp. 55–81.
- Kirchner, Gustav (1940). 'to want' as an auxiliary of modality'. In: *English Studies* 22.1-6, pp. 129–136.
- Kiss, Tibor (1995). *Infinitive Komplementation. Neue Studien zum deutschen Verbum infinitum*. Linguistische Arbeiten 333. Niemeyer.
- Kissine, Mikhail (2008). 'Why 'will' is not a modal.' In: *Natural Language Semantics* 16, pp. 129–155.
- Klein, Wolfgang (1994). *Time in Language*. London: Routledge.

- Kluempers, John David (1997). *The grammaticalization of a verb: the role of 'nicht brauchen' in the German modal verb system*. Ann Arbor: UMI.
- Kluge, Friedrich (2011). *Etymologisches Wörterbuch der deutschen Sprache*. 25th ed. Berlin: de Gruyter.
- Kolb, Hermann (1964). 'Über 'brauchen' als Modalverb'. In: *Zeitschrift für deutsche Sprache* 20, pp. 64–78.
- König, Ekkehard and Johan van der Auwera (1988). 'Clause integration in German and Dutch conditionals, concessive conditionals and concessives'. In: *Clause combining in grammar and discourse*. Ed. by John Haiman and Sandra A. Thompson. Amsterdam: John Benjamins, pp. 101–133.
- Kotin, Michail L. (2008). 'Aspects of a reconstruction of form and function of modal verbs'. In: *Modality-aspect interfaces*. Ed. by Werner Abraham and Elisabeth Leiss. Vol. 79. Typological Studies in Language. Amsterdam: John Benjamins, pp. 371–384.
- Kramer, Matthias (1702a). *Das herrlich-grosse Teutsch-Italiänische Dictionarium*. Nürnberg.
- Krämer, Sabine (2005). 'Synchrone Analyse als Fenster zur Diachronie. Die Grammatikalisierung von 'werden' + Infinitiv'. PhD thesis. Humboldt Universität zu Berlin.
- Kratzer, Angelika (1978). *Semantik der Rede. Kontexttheorie - Modalwörter - Konditionalsätze*. Scriptor.
- Kratzer, Angelika (1981). 'The Notional Category of Modality'. In: *Words, Worlds and Contexts. New approaches in World Semantics*. Ed. by Hans Jürgen Eikmeyer and Hannes Rieser. Berlin: Mouton de Gruyter, pp. 38–74.
- Kratzer, Angelika (1986). 'Conditionals'. In: *Papers from the parasession on pragmatics and grammatical theory at the 22nd regional meeting*. Ed. by A. M. Farley and P. T. Farley. Chicago Linguistic Society, pp. 1–15.
- Kratzer, Angelika (1991). 'Modality'. In: *Semantik. Ein internationales Handbuch der zeitgenössischen Forschung*. Ed. by Arnim von Stechow and Dieter Wunderlich. 639–650. Berlin: Mouton de Gruyter.
- Kratzer, Angelika (1995). 'Stage-level and individual-level predicates'. In: *The Generic book*. Ed. by Gregory N. Carlson and F. J. Pelletier. Chicago: University of Chicago Press, pp. 125–175.
- Kratzer, Angelika (2011). *Epistemic modals, embedded, modified, and plain*. Talk given at the 33rd DGfS, Göttingen.
- Kratzer, Angelika (2012). *Modals and Conditionals*. Oxford Studies in Theoretical Linguistics. Oxford: Oxford University Press.
- Krause, Maxi (1997). 'Zur Modalisierung bei Otfrid'. In: *Semantik der syntaktischen Beziehungen. Akten des Pariser Kolloquiums zur Erforschung des Althochdeutschen 1994*. Ed. by Yvon Desportes. Vol. 3. Germanistische Bibliothek. Heidelberg: Winter, pp. 92–106.
- Krifka, Manfred (2007). 'Basic notions of information structure'. In: *Interdisciplinary studies of information structure*. Ed. by Caroline Fery and Manfred Krifka. Vol. 6. Potsdam.
- Kurrelmeyer, Wilhelm (1910). 'Über die Entstehung der Konstruktion 'Ich habe sagen hören''. In: *Zeitschrift für deutsche Wortforschung* 12, pp. 157–173.
- Kürschner, Wilfried (1983). *Studien zur Negation im Deutschen*. Studien zur deutschen Grammatik 12. Tübingen: Narr.
- Lang, Ewald (1979). 'Zum Status der Satzadverbiale'. In: *Slovo a Slovesnost* 40, pp. 200–213.
- Langer, Nils (2001). *Linguistic Purism in Action. How auxiliary 'tun' was stigmatized in Early New High German*. Berlin: de Gruyter.
- Laserson, Peter (2005). 'Context dependence, disagreement and predicates of personal taste'. In: *Linguistics and Philosophy* 28, pp. 643–686.

- Lassiter, Daniel (2011). 'Measurement and modality: the scalar basis of modal semantics'. PhD thesis. New York University.
- Lechner, Winfried (2006). 'An Interpretive effect of head movement'. In: *Phases of Interpretation*. Ed. by Mara Frascarelli. Berlin: Mouton de Gruyter.
- Leech, Geoffrey N. (1971). *Meaning and the English verb*. London: Longman.
- Lehmann, Christian (1995). *Thoughts on Grammaticalization. Revised and expanded version*. Vol. 1. LINCOS Studies in Theoretical Linguistics. Lincom Europa.
- Leiss, Elisabeth (2002). 'Explizite und implizite Kodierung von Deontizität und Epistemizität'. In: *Jezykoslovlje* 3, pp. 69–98.
- Lenz, Barbara (1996). 'Wie 'brauchen' ins deutsche Modalverb-System geriet und welche Rolle es darin spielt.' In: *Beiträge zur Geschichte der deutschen Sprache und Literatur* 118, pp. 393–422.
- Letnes, Ole (2002). "'Wollen' zwischen Referat und Verstellung'. In: *Modus, Modalverben, Modalpartikel*. Ed. by Cathrine Fabricius-Hansen, Oddleif Leirbukt and Ole Letnes. Linguistisch-Philologische Studien 25. Trier: Wissenschaftlicher Verlag Trier, pp. 101–120.
- Levinson, Stephen (1983). *Pragmatics*. Cambridge textbooks in linguistics. Cambridge: Cambridge University Press.
- Levinson, Stephen C. (2000). *Presumptive meanings*. Cambridge, Mass.: MIT Press.
- Lewis, David (1979). 'Scorekeeping in a language game'. In: *Semantics from different points of view*. Ed. by Rainer Bäuerle, Urs Egli and Arnim von Stechow. Berlin: Springer, pp. 172–187.
- Leys, Odo (1991). 'Skizze einer kognitiv-semantischen Typologie der deutschen 'um'-Infinitive'. In: *Leuvense Bijdragen* 80, pp. 167–203.
- Lightfoot, David (1979). *Principles of diachronic syntax*. Vol. 23. Cambridge studies in linguistics. Cambridge: Cambridge University Press.
- Lima, José Pinto de (2004). 'On the evidential verbs in German and Portuguese: the grammaticalization of 'scheinen' and 'parecer''. In: *Linguistic studies in the European Year of Languages. Proceedings of the 36th Linguistic Colloquium, Ljubljana 2001*. Ed. by Stojan Bračič et al. Frankfurt/Main: Peter Lang, pp. 415–424.
- Lima, José Pinto de (2005). 'Zur Grammatikalisierung von dt. 'drohen' und pg. 'ameaçar''.
- López, Luis and Susanne Winkler (2000). 'Focus and topic in VP-anaphora constructions'. In: *Linguistics* 38.4, pp. 623–664.
- Lötscher, Andreas (1991). 'Der Konjunktiv II bei Modalverben und die Semantik des Konjunktiv II'. In: *Sprachwissenschaft* 16, pp. 334–364.
- Lyons, John (1977). *Semantics*. Vol. 2. Cambridge: Cambridge University Press.
- Maché, Jakob (2008). 'The autopsy of a modal - insights from the historical development of German'. In: *Modality-Aspect Interfaces. Implications and Typological Solutions*. Ed. by Werner Abraham and Elisabeth Leiss. Vol. 79. Typological Studies in Language. Amsterdam: Benjamins, pp. 385–415.
- Maché, Jakob (2009). 'Das Wesen epistemischer Modalität'. In: *Modalität, Epistemik und Evidentialität bei Modalverb, Adverb, Modalpartikel und Modus*. Ed. by Werner Abraham and Elisabeth Leiss. Vol. 77. Studien zur deutschen Grammatik. Tübingen: Stauffenburg, pp. 25–55.
- Maché, Jakob (2012). 'Exploring the theory of mind interfaces'. In: *Theory of Mind Elements across Languages*. Ed. by Werner Abraham and Elisabeth Leiss. Trends in Linguistics 243. Berlin: de Gruyter, pp. 109–146.

- Maché, Jakob and Werner Abraham (2011). 'Infinitivkomplemente im Frühen Neuhochdeutsch - satzwertig oder nicht?' In: *Germanistische Linguistik*. 235–274 213–215, pp. 235–274.
- Maienborn, Claudia (1994). 'Kompakte Strukturen: Direktionale PPn und nicht-lokale Verben'. In: *Kognitive Linguistik. Repräsentationen und Prozesse*. Ed. by Sascha Felix, Christopher Habel and Gert Rickheit. Opladen: Westdeutscher Verlag, pp. 229–249.
- Maienborn, Claudia (2003). *Die logische Form von Kopulasätzen*. studia gramatica 56. Berlin: Akademie Verlag.
- Maienborn, Claudia (2004). 'A pragmatic explanation of the stage level / individual level contrast in combination with locatives'. In: *Proceedings of the WECOL*. Ed. by Brian Agbayabi, Vida Samiian and Benjamin Tucker. Vol. 15. Fresno: CSU, pp. 158–170.
- Maienborn, Claudia (2007). 'Das Zustandspassiv. Grammatische Einordnung - Bildungsbeschränkungen - Interpretationsspielraum (erscheint)'. In: *Zeitschrift für Germanistische Linguistik* 35, pp. 83–115.
- Máitz, Péter and Krisztián Tronka (2009). 'brauchen' - Phonologische Aspekte der Auxiliarisierung'. In: *Zeitschrift für Dialektologie und Linguistik* LXXVI.2, pp. 189–202.
- Martin, Fabienne (2011). 'Epistemic modals in the past'.
- McDowell, Joyce (1987). 'Assertion and Modality'. PhD thesis. University of Southern California.
- Meid, Wolfgang (1971). *Das germanische Präteritum. Indogermanische Grundlagen und Ausbreitung im Germanischen*. Vol. 3. Innsbrucker Beiträge zur Sprachwissenschaft. Innsbruck: Kowatsch.
- Menedéz-Benito, Paula (2010). 'On universal free choice items'. In: *Natural Language Semantics* 18, pp. 33–64.
- Merchant, Jason (2009). 'Ellipsis'. In: *Syntax: an international handbook*. Ed. by Artemis Alexiadou and Tibor Kiss. 2nd ed. Berlin: Mouton de Gruyter.
- Milan, Carlo (2001). *Modalverben und Modalität: eine kontrastive Untersuchung Deutsch - Italienisch*. Vol. 444. Linguistische Arbeiten. Niemeyer.
- Mortelmans, Tanja (2000). 'Konjunktiv II and epistemic modal verbs in German'. In: *Constructions in Cognitive Linguistics*. Ed. by Ad Foolen and Frederike van der Leek. Vol. 178. Current Issues in Linguistic Theory. Amsterdam: John Benjamins, pp. 191–215.
- Mortelmans, Tanja, Kasper Boye and Johan van der Auwera (2009). 'Modals in the Germanic languages'. In: *Modals in the languages of Europe*. Ed. by Björn Hansen and Ferdinand de Haan. Vol. 44. Empirical Approaches to Language Typology. Berlin: De Gruyter, pp. 11–69.
- Moscato, Vincenzo (2006). 'The scope of negation'. PhD thesis. Università di Siena.
- Moulton, Keir (2010). 'Small Clauses do reconstruct'. To be published in Proceedings of NELS 41.
- Müller, Reimar (2001). 'Modalität im Prosalanzelot'. In: *Modalität und Modalverben im Deutschen*. Ed. by Marga Reis and Reimar Müller. Hamburg: Buske, pp. 239–262.
- Müller, Stefan (2002). *Complex predicates: verbal complexes, resultative constructions and particle verbs in German*. Stanford, CA: CSLI.
- Müller, Stefan (2007). *Head-Driven Phrase Structure Grammar. Eine Einführung*. Vol. 17. Stauffenburg Einführungen. Tübingen: Stauffenburg.
- Müller, Stefan (2009). 'On predication'. In: *Proceedings of the HPSG09 Conference, University of Goettingen*. Ed. by Stefan Müller. Stanford: CSLI publications, pp. 213–233.
- Müller, Stefan (2013). 'On the Copula, Specificational Constructions and Type Shifting'.
- Murray, James A.H. (1933). *A new English dictionary on historical principles*. Vol. 7. Oxford: Clarendon.

- Neugeborn, Wolfgang (1976). 'Zur Analyse von Sätzen mit finiter Verbform + Infinitiv'. In: *Untersuchungen zur Verbvalenz*. Ed. by H. Schumacher, pp. 66–74.
- Newmeyer, Frederick J. (1970). 'The 'root modal': can it be transitive?' In: *Studies presented to Robert B. Lees by his students*. Ed. by Jerrold M. Sadock and Anthony Vanek. Vol. 1. Papers in linguistic monographs series. Edmonton: Linguistic Research, pp. 189–196.
- Nissenbaum, Jon (2005). 'Kissing Pedro Martinez: (existential) anankastic conditionals and rationale clauses'. In: *Proceedings of SALT XV*. Cornell University. Ithaca, NY, pp. 134–151.
- Nuyts, Jan (2001a). *Epistemic Modality, Language, and Conceptualization*. Amsterdam: John Benjamins.
- Nuyts, Jan (2001b). 'Subjectivity as an evidential dimension in epistemic modal expression'. In: *Journal of Pragmatics* 33.3, pp. 383–400.
- Öhlschläger, Günther (1989). *Zur Syntax und Semantik der Modalverben*. Vol. 144. Linguistische Arbeiten. Tübingen: Niemeyer.
- Ölinger, Albert (1574). *Vnderricht der Hoch Teutschen Sprach*. Straßburg.
- Ørnes, Bjarne (2007). 'Form und Funktion bei der Verwendung des Ersatzinfinitivs im Deutschen. Zum Gebrauch des Ersatzinfinitivs bei Fügung mit Modalverb und Direktionalergänzung'. In: *Acta Linguistica Hafniensia* 40, pp. 121–158.
- Pafel, Jürgen (1989). 'scheinen' + Infinitiv. eine oberflächengrammatische Analyse'. In: *Wissen, Wahrnehmung, Glauben: epistemische Ausdrücke und propositionale Einstellungen*. Ed. by G. Falkenberg. Vol. 202. Linguistische Arbeiten. GELESEN. Niemeyer, pp. 123–172.
- Palmer, Frank R. (1990). *Modality and the English modals*. 2nd ed. London: Longman.
- Palmer, Frank Robert (1986). *Mood and Modality*. Cambridge text books in linguistics. Cambridge: Cambridge University Press.
- Papafragou, Anna (2006). 'Epistemic modality and truth conditions'. In: *Lingua* 116, pp. 1688–1702.
- Paul, Hermann (1897). *Deutsches Wörterbuch*. Halle a.S.: Niemeyer.
- Paul, Hermann (1898). *Prinzipien der Sprachgeschichte*. 3rd ed. Halle a. d. Salle: Niemeyer.
- Paul, Hermann (1917). *Deutsche Grammatik*. Vol. 2. Halle: Niemeyer.
- Paul, Hermann (1920). *Deutsche Grammatik*. Vol. 4 Syntax II. Niemeyer.
- Perkins, Michael R. (1983). *Modal expressions in English*. Norwood, New Jersey: Ablex Publishing Corporation.
- Perlmutter, David (1970). 'The two verbs 'begin''. In: *Reading in English Transformational Grammar*. Ed. by Roderick Jacobs and Peter S. Rosenbaum. Boston: Ginn, pp. 107–119.
- Pfeffer, Alan J. (1973). 'Brauchen' als Vollverb, Hilfsverb und Modalverb'. In: *Wirkendes Wort* 23, pp. 86–92.
- Pietandrea, Paola (2005). *Epistemic modality: functional properties and the Italian system*. Studies in language companion series. Amsterdam: John Benjamins.
- Pillot, Jean (1550). *Gallicae Linguae institutio*. Paris.
- Pittner, Karin (2003). 'Kasuskonflikte bei freien Relativsätzen'. In: *Deutsche Sprache*, pp. 193–208.
- Pokorny, Julius (1959). *Indogermanisches etymologisches Wörterbuch*. Bern: Francke.
- Pollard, Carl and Ivan A. Sag (1994). *Head driven phrase structure grammar*. Studies in contemporary linguistics. Stanford: CSLI.
- Portner, Paul (2009). *Modality*. Oxford: Oxford University Press.
- Quirk, Randolph et al. (1985). *A Comprehensive Grammar of the English Language*. London: Longman.
- Raynaud, Franziska (1977). 'Noch einmal Modalverben!' In: *Deutsche Sprache* 1, pp. 1–30.

- Redder, Angelika (1984). *Modalverben im Unterrichtsdiskurs. Pragmatik der Modalverben am Beispiel eines institutionellen Diskurses*. Vol. 54. Reihe germanistische Linguistik. Tübingen: Niemeyer.
- Reis, Marga (1995). 'Über infinite Nominativkonstruktionen'. In: *Festvorträge anlässlich des 60. Geburtstags von Inger Rosengren*. Ed. by Olaf Önnersfors. Sprache und Pragmatik. Arbeitsberichte Sonderheft. Lund: University of Lund.
- Reis, Marga (2001). 'Bilden Modalverben im Deutschen eine syntaktische Klasse?' In: *Modalität und Modalverben im Deutschen*. Ed. by Marga Reis and Reimar Müller. Hamburg: Buske, pp. 239–262.
- Reis, Marga (2003). 'On the form of German wh-infinitives'. In: *Journal of Germanic Linguistics* 15, pp. 155–201.
- Reis, Marga (2005a). 'Wer 'brauchen' ohne 'zu' gebraucht: zu systemgerechten Verstößen im Gegenwartsdeutschen'. In: *Cahier d'Etudes Germaniques* 48.1, pp. 101–114.
- Reis, Marga (2005b). 'Zur Grammatik der sogenannten 'Halbmodale' 'drohen'/'versprechen' + Infinitiv'. In: *Deutsche Syntax: Empirie und Theorie, Symposium Göteborg 13-15 Mai 2004*. Ed. by Franz-Josef d'Avis. Vol. 46. Acta Universitatis Gothoburgensis, pp. 125–145.
- Reis, Marga (2007). 'Modals, so-called semi-modaly and grammaticalization in German'. In: *Interdisciplinary Journal for Germanic Linguistics and Semiotic Analysis* 12.1, pp. 1–58.
- Reis, Marga (2013). '„Weil-V2“-Sätze und (k)ein Ende? Anmerkungen zur Analyse von Antomo & Steinbach 2010'. In: *Zeitschrift für Sprachwissenschaft* 32.2, pp. 221–262.
- Reis, Marga and Angelika Wöllstein (2010). 'Zur Grammatik (vor allem) konditionaler V1-Gefüge im Deutschen'. In: *Zeitschrift für Sprachwissenschaft* 29, pp. 111–179.
- Remberger, Eva-Maria (2010). 'The evidential shift of WANT'. In: *Evidence from Evidentials*. Ed. by Tyler Peterson and Uli Sauerland. Vol. 25. UBC Working Papers in Linguistics. Vancouver: University of British Columbia, pp. 161–182.
- Richter, Frank and Manfred Sailer (2008). 'Simple Trees with Complex Semantics: On Epistemic Modals and Strong Quantifiers'. In: *Proceedings of the ESSLLI Workshop on "What Syntax feeds Semantics?"* Ed. by Maribel Romero. Hamburg.
- Riemsdijk, Henk van (2002). 'The unbearable lightness of going: the projection parameter as a pure parameter governing the distribution of elliptic motion verbs in Germanic'. In: *Journal of Comparative Germanic Linguistics* 5, pp. 143–196.
- Rix, Helmut (2001). *Lexikon der indogermanischen Verben*. 2nd ed. Wiesbaden: Reichert.
- Roberts, Ian and Anna Roussou (1999). 'A formal approach to 'grammaticalization''. In: *Linguistics* 37.6, pp. 1011–1041.
- Roberts, Ian G. (2003). *Synactic change: a minimalist approach to grammaticalization*. Vol. 100. Cambridge studies in linguistics. Cambridge: University Press.
- Rooth, Mats (1992). 'A theory of focus interpretation'. In: *Natural Language Semantics* 1, pp. 75–116.
- Rooth, Mats Edward (1985). 'Association with focus'. PhD thesis. Amherst: University of Massachusetts.
- Ross, John Robert (1969). 'Auxiliaries as main verbs'. In: *Studies in Philosophical Linguistics* 1, pp. 77–102.
- Rossmann, Bernhard (1908). *Zum Gebrauch der Modi und Modalverba in Adverbialsätzen im Frühmittelenglischen*. Kiel: Fiencke.
- Ruoff, Arno (1981). *Häufigkeitwörterbuch gesprochener Sprache*. Tübingen: Niemeyer.
- Sanders, Daniel (1908). *Wörterbuch der Hauptschwierigkeiten in der deutschen Sprache*. 38th ed. Berlin/ Schöneberg: Langenscheidt.

- Scaffidi-Abbate, August (1973). 'Brauchen' mit folgendem Infinitiv'. In: *Muttersprache* 83, pp. 1–45.
- Schachter, Paul (1984). 'A note on syntactic categories and coordination in GPSG'. In: *Natural Language and Linguistic Theory* 2, pp. 269–281.
- Schallert, Oliver (2014a). 'IPP–constructions in Alemannic and Bavarian in comparison'. In: *Bavarian*. Ed. by Günther Grewendorf and Helmut Weiß. Vol. 220. *Linguistik Aktuell/Linguistics Today*. Amsterdam: Benjamins.
- Schallert, Oliver (2014b). *Zur Syntax der Ersatzinfinitivkonstruktion: Typologie und Variation*. Studien zur deutschen Grammatik 87. Tübingen: Narr.
- Schenner, Matthias (2009). 'Semantic of evidentials'. In: *Proceedings of ConSOLE XVI 2008*. Ed. by Sylvia Blaho, Camelia Constantinescu and Bert Le Bruyn. Leiden: Universiteit Leiden, pp. 179–198.
- Scheutz, Hannes (1999). 'weil'-Sätze im gesprochenen Deutsch'. In: *Beiträge zur Oberdeutschen Dialektologie*. Ed. by Claus Jürgen Hutterer and Gertrude Pauritsch. Göppingen: Kümmerle, pp. 85–112.
- Schmid, Tanja (2000). 'Die Ersatzinfinitivkonstruktion im Deutschen'. In: *Linguistische Berichte* 183, pp. 325–351.
- Schoetensack, Heinrich August (1856). *Grammatik der neuhochdeutschen Sprache*. Erlangen: Ferdinand Enke.
- Scholz, Ulrike (1991). *Wunschsätze im Deutschen – formale und funktionale Beschreibung*. Vol. 265. *Linguistische Arbeiten*. Tübingen: Niemeyer.
- Scholz-Stubenrecht, Werner (2000). *Duden – Die deutsche Rechtschreibung*. 22nd ed. Mannheim: Duden Verlag.
- Schottel, Justus Georg (1663). *Ausführliche Arbeit von der Teutschen HauptSprache: worin enthalten Gemelter dieser Hauptsprache Urankunft, Uralterthum, Reinlichkeit, Eigenschaft, Vermögen, Unvergleichlichkeit, Grundrichtigkeit*. Braunschweig: Ziliger.
- Schwabe, Kerstin (1994). *Syntax und Semantik situativer Ellipsen*. Vol. 48. *Studien zur deutschen Grammatik*. Tübingen: Narr.
- Selkirk, Lisa O. (1984). *Phonology and syntax. The relation between sound and structure*. Vol. 10. *Current studies in linguistics*. Cambridge, Mass: MIT Press.
- Shopen, Tim (1973). In: *Foundations of Language* 10.
- Speyer, Augustin (2011). 'Zur Integriertheit kausaler (Neben-)Sätze im Fruehneuhochdeutschen'. In: *Sprachwissenschaft* 36.1, pp. 53–84.
- Stalnaker, Robert (1978). 'Assertion'. In: *Syntax and semantics 9: Pragmatics*. New York: Academic Press.
- Stechow, Arnim von (2003). 'Schritte zur Satzsemantik.'
- Stechow, Arnim von and Wolfgang Sternefeld (1988). *Bausteine syntaktischen Wissens: ein Lehrbuch der generativen Grammatik*. Opladen: Westdeutscher Verlag.
- Steinitz, Renate (1999). 'Die Kopula 'werden' und die Situationstypen'. In: *Zeitschrift für Sprachwissenschaft* 18.1, pp. 121–151.
- Stephenson, Tamina (2007). 'Judge Dependence, Epistemic Modals and Predicates of Personal Taste'. In: *Linguistics and Philosophy* 30, pp. 487–525.
- Sütterlin (1910). *Die deutsche Sprache der Gegenwart*. 3rd ed. Leipzig: Voigtländer.
- Sweet, Henry (1891). *New English Grammar. Logical and Historical. Volume I. Introduction, phonology and accidence*. Oxford: Clarendon Press.
- Sweetser, Eve (1990). *From etymology to pragmatics. Metaphorical and cultural aspects of semantic structure*. Vol. 54. *Cambridge studies in linguistics*. Cambridge: University Press.

- Sweetser, Eve and Barbara Dancygier (2005). *Mental spaces in grammar: conditional constructions*. Cambridge: Cambridge University Press.
- Szumlakowski, Irene (2010). "Dann brauche ich nicht mehr zum Rathaus' Eine weitere Modalverbeigenschaft des Verbs 'brauchen". In: *Deutsche Sprache* 38.1, pp. 70–80.
- Szumlakowski-Morodo, Irene (2006). "Ich will weg, wohin musst du' Modalverben mit Richtungsbestimmung und ohne Infinitiv". In: *Muttersprache* 116, pp. 322–347.
- Takahaši, Terukazu (1984). "Über den subjektiven Gebrauch des Modalverbs 'brauchen". In: *Sprachwissenschaft* 9, pp. 21–22.
- Tancredi, Christopher (2007). *A Multi-Model Modal Theory of I-Semantics. Part I: Modals*. Ms. University of Tokyo.
- Thráinsson, Höskuldur and Sten Vikner (1995). 'Modals and double modals in the Scandinavian Languages'. In: *Working Papers in Scandinavian Syntax* 55, pp. 51–88.
- Traugott, Elizabeth Closs (1985). 'Conditional markers'. In: *Iconicity in syntax*. Ed. by John Haiman. Amsterdam: John Benjamins, pp. 289–307.
- Traugott, Elizabeth Closs (1989). 'On the rise of epistemic meanings in English: an example of subjectification in semantic change.' In: *Language* 65.1, pp. 31–55.
- Traugott, Elizabeth Closs (1997). 'Subjectification and the development of epistemic meaning: The case of 'promise' and 'threaten'.' In: *Modality in Germanic Languages*. Ed. by Toril Swan and Olaf Jansen Westvik. Berlin: de Gruyter, pp. 185–210.
- Tregidgo, Philip (1982). "'Must' and 'may': demand and permission". In: *Lingua* 56.1, pp. 75–92.
- Truckenbrodt, Hubert (2006). 'On the semantic motivation of syntactic verb movement to C in German'. In: *Theoretical Linguistics* 32.3, pp. 257–306.
- Uhmann, Susanne (1998). 'Verbstellung in 'weil'-Sätzen: Lexikalische Differenzierungen mit grammatischen Folgen'. In: *Zeitschrift für Sprachwissenschaft* 1.17, pp. 92–139.
- Vainikka, Anne and Martha Young-Scholten (1994). 'Direct Access to X'-Theory: evidence from Turkish and Korean adults learning German'. In: *Language Acquisition Studies in Generative Grammar*. Ed. by Bonnie D. Schwartz and Teun Hoekstra. Benjamins, pp. 256–316.
- Vater, Heinz (1975). "'werden' als Modalverb". In: *Aspekte der Modalität*. Ed. by Heinz Vater and Joseph Calbert. Studien zur deutschen Grammatik 1. Narr, pp. 71–148.
- Vater, Heinz (2001). "'Sollen' und 'wollen' – zwei ungleiche Brüder". In: *Modalität und mehr*. Ed. by Heinz Vater and Ole Letnes. Vol. 23. Fokus. Trier: Wissenschaftlicher Verlag, pp. 81–100.
- Vater, Heinz (2004). 'Zur Syntax und Semantik der Modalverben'. In: *Modalität und Übersetzung*. Ed. by Ole Letnes and Heinz Vater. Trier: Wissenschaftlicher Verlag, pp. 9–31.
- Vater, Heinz (2010). "'Möchten' als Modalverb". In: *Modalität / Temporalität aus kontrastiver und typologischer Sicht*. Ed. by Andrzej Kątny and Anna Socka. Vol. 30. Danziger Beiträge zur Germanistik. Peter Lang, pp. 99–112.
- Vernaleken, Theodor (1861). *Deutsche Syntax*. Vol. 1. Wien.
- Vogel, Petra (2005). 'Neue Überlegungen zu den Fügungen des Typs 'sie kamen gelaufen''. In: *Zeitschrift für Germanistische Linguistik* 33, pp. 57–77.
- Watts, Richard J. (1984). 'An analysis of epistemic possibility and probability'. In: *English Studies* 65.2, pp. 129–140.
- Wegener, Heide (1993). 'weil - das hat schon seinen Grund. Zur Verbstellung in Kausalsätzen mit 'weil' im Gegenwärtigen Deutsch'. In: *Deutsche Sprache* 21, pp. 289–305.
- Weinrich, Harald (1993). *Textgrammatik der Deutschen Sprache*. Mannheim: Dudenverlag.

- Welke, Klaus (1965). *Untersuchungen zum System der Modalverben in der deutschen Sprache der Gegenwart*. Vol. 10. Schriften zur Phonetik, Sprachwissenschaft und Kommunikationsforschung. Berlin: Akademie Verlag.
- Westmoreland, Robert R. (1998). 'Information and intonation in natural language modality'. PhD thesis. Michigan: University of Michigan.
- Wilder, Chris (2008). 'The PP-'with'-DP construction'. In: *Elements of Slavic and Germanic grammars: a comparative view*. Ed. by Jacek Witkos and Gisbert Fanselow. Frankfurt/Main: Peter Lang, pp. 235–253.
- Williams, Edwin (1983). 'Against small clauses'. In: *Linguistic Inquiry* 14, pp. 287–308.
- Wilmanns, Wilhelm (1906). *Deutsche Grammatik Gotisch, Alt-, Mittel- und Neuhochdeutsch*. Vol. 3.1. Strassburg: Trübner.
- Winkler, Susanne (2006). 'Ellipsis'. In: *The Encyclopedia of Language and Linguistics*. Ed. by Keith Brown. 2nd ed. Oxford: Elsevier.
- Wurmbrand, Susi (1999). 'Modalverbs must be raising verbs'. In: *Proceedings of the 18th West Coast Conference on Formal Linguistics*. Ed. by Sonya Bird et al. Somerville, Mass: Cascadia Press, pp. 599–612.
- Wurmbrand, Susi (2001). *Infinitives. Restructuring and Clause Structure*. Vol. 55. Studies in Generative Grammar. Berlin: Mouton de Gruyter.
- Wurzel, Wolfgang Ullrich (1984). *Flexionsmorphologie und Natürlichkeit: ein Beitrag zur morphologischen Theoriebildung*. Vol. 21. Studia grammatica. Berlin: Akademie Verlag.
- Wustmann, Gustav (1896). *Allerhand Sprachdummheiten*. 2nd ed. S. 334 anti FVG. Leipzig: Grunow.
- Wustmann, Gustav (1908). *Allerhand Sprachdummheiten*. 4th ed. Leipzig: Grunow.
- Zaefferer, Dietmar (1987). 'Satztypen, Satzarten, Satzmodi – was Konditionale (auch) mit Interrogativen zu tun haben'. In: *Satzmodus zwischen Grammatik und Pragmatik*. Ed. by Jörg Meibauer. Tübingen: Niemeyer, pp. 259–285.
- Ziegeler, Debra (2006). 'Omnitemporal 'will''. In: *Language Sciences* 28, pp. 76–119.
- Zifonun, Gisela (1997). *Grammatik der deutschen Sprache*. Berlin: de Gruyter.
- Zimmermann, Malte (2004). 'Zum Wohl: Diskurspartikel als Satztypmodifikatoren'. In: *Linguistische Berichte* 199, pp. 253–286.

Author index

- Abraham, Werner 1, 7, 14, 16, 17, 21, 32, 43, 48, 54, 77, 99, 108, 131, 210, 236, 255, 280, 323, 335, 338, 340, 342, 522, 523, 542, 546, 551
- Adéwólé, Fẹ́mi O. 327, 328
- Adelung, Johann Christoph 19, 43, 181, 186, 189, 217, 218, 259, 393
- Aijmer, Karin 380, 395, 398, 406, 410, 415, 416, 426, 433, 441–443
- Alban, Doctor 14
- Aldenhoff, Jules 17, 18, 192, 195, 198
- Allard, Francis X. 102, 155, 159, 165, 372, 400, 456
- Ammann, Andreas 288, 328
- Anand, Pranav 415
- Antomo, Mailin 294, 296, 416, 546
- Asbach-Schnitker, Brigitte 424, 438, 444
- Askedal, John Ole 21, 22, 32, 57, 177, 184, 195, 206, 210, 211, 214, 215, 229–233, 235, 237–239, 242, 244, 245, 247, 248, 338, 342, 361, 373, 503, 504, 517, 538
- Axel, Katrin 1, 33, 45, 47, 48, 77, 99, 165, 170, 348, 389, 396, 405, 541, 542
- Bödiker, Johann 14, 19, 258, 273
- Bühler, Karl 32, 336, 522
- Barbiers, Sjeff 48, 54–56, 58, 59, 61, 62, 77, 121, 280, 285, 286, 330, 345, 360
- Bartsch, Renate 455
- Basler, Otto 267, 268, 271
- Bauer, Friedrich 8, 220, 226, 263, 267–269, 275
- Bauer, Heinrich 262
- Bech, Gunnar 8, 9, 22, 27, 30, 31, 59, 62, 95, 99, 100, 104, 108, 109, 115, 116, 118, 119, 123, 129, 131, 133, 137, 138, 142, 146, 147, 152, 154, 155, 165, 177, 184, 204, 238, 242, 269–272, 275, 286, 372, 393, 450, 456, 496, 523
- Becker, Karl Ferdinand 17, 29, 30, 44, 76, 98, 99, 108, 118, 124, 129, 137, 142, 147, 148, 155, 178, 184, 190, 260–265, 269, 270, 273, 276, 496
- Behaghel, Otto 57, 267, 308
- Beringer, Nicole 17
- Bhatt, Rajesh 431
- Bildhauer, Felix 532
- Birkmann, Thomas 10, 11, 17, 23, 24, 33, 34, 43, 116, 193
- Blühdorn, Hardarik 50, 134, 374
- Blatz, Friedrich 264, 269, 273, 275
- Bloch, Oscar 183
- Bolkestein, Machtelt A. 325, 326, 542
- Boye, Kasper 1, 70, 177, 178, 323, 340, 360, 455, 485
- Brünner, Gisela 218, 272
- Braune, Wilhelm 10, 11, 266, 273, 276
- Brennan, Virginia 38, 45, 47, 48, 52, 54, 72, 77, 81, 208, 220, 224, 226, 228, 287, 288, 323, 329, 378, 385, 386, 394, 453, 472, 476, 523
- Bres, Jacques 220
- Brinkmann, Hennig 100, 176, 177
- Buscha, Joachim 8, 9, 12, 26, 40, 104, 123, 172, 342
- Butler, Jonny 323, 328, 378, 473, 538
- Butt, Miriam 256
- Bybee, Joan 1, 541
- Calbert, Joseph P 100
- Carlson, Gregory N. 38, 52, 81, 208, 288, 549
- Carpenter, Bob 80, 118, 132, 206
- Chomsky, Noam 233
- Cinque, Guglielmo 6, 341, 380, 389, 394, 455, 492, 535, 537
- Clément, Danièle 307, 455
- Claius, Johannes 10, 19, 20, 257
- Coates, Jennifer 64, 72, 287, 348, 355, 357, 372–375, 380, 472, 481
- Cohen, Ariel 335, 467
- Colomo, Katarina 109, 141, 235, 238, 239, 241, 242, 244, 248, 249, 286, 333, 341, 348, 504, 514, 526, 527, 535

<https://doi.org/10.1515/9783110411027-011>

- Comrie, Bernard 227
 Condoravdi, Cleo 355
 Coniglio, Marco 414, 434, 436, 438, 441, 444
 Copley, Bridget 71, 75, 144, 145
 Cornillie, Bert 239, 323, 326
 Curme, George O. 8, 9, 11, 31, 108, 124, 137, 165, 265, 266, 269, 275, 287, 393, 394, 486
- Dal, Ingerid 270
 Dancygier, Barbara 289
 De Haan, Ferdinand 327, 328
 Declerck, Renaat 429, 432
 Demirdache, Hamida 323, 345
 Demske, Ulrike 23, 24
 Denison, David 55, 130, 219, 542, 543
 Depraetere, Ilse 386, 524
 Diesing, Molly 549
 Dietrich, Rainer 387
 Diewald, Gabriele 1, 3, 8, 9, 23, 24, 27, 31, 33, 34, 37, 44, 46, 48, 54, 62, 99, 102, 119, 128, 146, 147, 152, 154, 155, 159, 165, 166, 170, 229, 230, 232, 233, 235, 244, 245, 247, 250, 253, 255, 275, 323, 348, 372, 373, 389, 400, 402, 403, 405, 406, 456, 464, 466–471, 475, 476, 523, 524, 527, 541, 543
 Dik, Simon C. 332
 Doherty, Monika 386, 485, 496
 Doitchinov, Serge 73, 74, 542
 Dougherty, Ray C. 97, 137
 Dowty, David 111
 Drosdowski, Günther 199, 242, 271, 272
 Drubig, Hans Bernhard 72, 288, 328, 335, 361, 373, 378, 380, 389, 426, 444, 472, 481
 Duden, Konrad 267, 268
- Ebert, Robert Peter 13, 14, 16, 46, 167, 229, 233, 235
 Ehlich, Konrad 33, 211
 Ehrich, Veronika 100, 104, 109, 133, 141, 174, 503, 526
- Eide, Kristin Melum 6, 63, 142, 178, 323, 335, 338, 341, 345, 360, 361, 368, 481, 485, 488, 492, 535
 Eisenberg, Peter 8, 11, 19, 22, 95, 98, 147, 167, 168, 176, 220, 223, 272, 277, 299, 304, 306, 307, 314, 342, 343, 355, 429, 432–434, 466, 488, 501
 Enç, Mürvet 32, 220, 224, 226, 228, 286, 401, 453
 Engel, Ulrich 8, 22, 31, 32, 35, 176, 226, 250, 275, 364
 Erb, Marie Christine 19, 31, 32, 34, 41, 44–48, 54, 56, 60, 76, 77, 95, 98, 99, 110, 111, 170, 223–228, 323, 335, 338, 339, 342, 343, 348–350, 360, 368, 371, 481, 524, 537–539
 Eroms, Hans-Werner 294
- Fabricius-Hansen, Cathrine 151, 227, 228, 292, 293, 429, 430, 432, 440, 466
 Fagan, Sarah M. B. 342, 490, 504
 Faller, Martina 109, 141, 526, 527, 529
 Feldman, Fred 48, 54
 Fillmore, Charles J. 31, 336, 522
 Fintel, Kai von 31, 62, 354, 355, 378, 389, 408, 444–447, 452, 458, 473, 477, 524, 535
 Fleischer, Jürg 16
 Folsom, Marvin H. 176, 177, 184, 193, 198, 204, 206, 210, 211, 275
 Fourquet, Jean 271, 323
 Freywald, Ulrike 302
 Fritz, Gerd 1, 2, 27, 33, 34, 43, 52, 55, 64, 67, 70, 93, 95, 98, 115, 121, 128, 131, 133, 142, 147, 154, 155, 160, 164, 165, 226, 228, 287, 372, 373, 393, 394, 456, 464, 466, 541, 543
- Gamon, David 468
 Gazdar, Gerald 97, 137
 Geilfuß, Jochen 48, 77
 Gelhaus, Hermann 199
 Gergel, Remus 25, 48, 103, 104, 111
 Geuder, Wilhelm 332
 Gillies, Anthony S. 31, 62, 354, 355, 378, 408, 477, 524, 535

- Ginzburg, Jonathan 318
 Girth, Heiko 17, 190, 192, 193
 Glas, Reinhold 131, 142, 432
 Götzke, Alfred 199, 201, 202, 267
 Grebe, Paul 193, 242, 270, 271
 Grice, Paul 238
 Gries, Stefan Th. 42
 Griesbach, Heinz 8, 9, 21, 31, 270, 272, 275, 342
 Grimm, Jacob 9, 11, 14, 15, 17, 18, 35, 178, 181, 182, 184, 186, 190, 195, 217, 218, 259, 260, 277
 Grimm, Wilhelm 181, 182, 186, 217, 218
 Grosz, Patrick 50, 488, 535
 Gunlogson, Christine 319
 Günthner, Susanne 298–302, 416
- Hacquard, Valentine 280, 288, 323, 337, 345, 349, 354, 383, 394, 411, 415, 432, 452, 482, 484, 523
 Haegeman, Liliane 289–294, 301, 302, 414, 428, 429, 432–434, 441, 443, 466
 Haider, Hubert 37, 249
 Hansen, Björn 327
 Hartmann, Jutta 25, 48, 103, 104, 111
 Heim, Irene 446
 Heine, Bernd 212, 225, 349
 Heinrich, Gertraud 8
 Helbig, Agnes 310
 Helbig, Gerhard 8, 9, 12, 26, 40, 104, 123, 172, 310, 342
 Hengeveld, Kees 348, 373, 380, 426, 468
 Hetland, Jorunn 20, 43, 54, 55, 58, 60, 142
 Heyse, Johann Christian August 18, 38, 54, 260, 261
 Hill, Virginia 326
 Hinterhölzl, Roland 12, 13
 Hinterwimmer, Stefan 99, 131, 138, 145
 Hofmann, Thomas Ronald 72, 287, 378, 472
 Höhle, Tilman N. 37, 48, 77, 99, 131, 369, 235, 369, 371
 Holler, Anke 189
 Homer, Vincent 349, 354, 378, 473
 Hornstein, Norbert 46
- Huitink, Janneke 126, 127, 163, 335, 374, 406, 410, 411, 415, 426, 446–449, 453–456, 467, 470, 471, 473, 475, 477
- latridou, Sabine 378, 389, 444–447, 452, 458, 473
- Jäger, Agnes 233
 Jäger, Gerhard 331
 Jäger, Siegfried 185, 198
 Jackendoff, Ray 46, 48, 54, 77, 97, 137, 323, 380, 386, 389
 Jacobs, Joachim 369, 370, 374, 532, 533
 Jędrzejowski, Łukasz 344, 354
 Jellinek, Max Hermann 257, 260
 Jespersen, Otto 55, 267
 Johnen, Thomas 27, 260
- Kaeding, Friedrich Wilhelm 37
 Kaiaty, Mohamed 151, 152
 Kaita, Kousuke 219
 Kasper, Walter 66, 90, 342, 345, 355
 Kiaulehn, Walther 193
 Kiefer, Ferenc 335, 368, 373, 380, 402, 469
 Kirchner, Gustav 269
 Kiss, Tibor 33, 37, 46, 48, 77, 99, 100, 128, 165, 170, 238
 Kissine, Mikhail 224
 Klein, Wolfgang 348
 Klindt, Saskia 288, 328
 Kluempers, John David 182, 202, 211, 218, 219
 Kluge, Friedrich 179
 Kolb, Hermann 176, 177, 179, 184, 190–192, 194, 195, 204, 217, 218, 271, 275
 König, Ekkehard 307, 545
 Kotin, Michail L. 124, 160, 327
 Krämer, Sabine 3, 31, 223, 225–228, 335, 337, 405, 406, 415, 442, 524
 Kramer, Matthias 189
 Kratzer, Angelika 7, 27–29, 31, 34, 62, 113, 118, 119, 123, 124, 158, 224, 228, 272, 286, 289, 290, 313, 317, 323, 328, 329, 331, 333, 371, 377,

- 384, 428, 433, 441, 456, 471, 495,
523, 524, 531, 537, 542, 549
- Krause, Maxi 542, 543
- Krifka, Manfred 370
- Kurrelmeyer, Wilhelm 13, 16, 268
- Kürschner, Wilfried 204, 210, 211
- Labeau, Emanuelle 220
- Lang, Ewald 424
- Langer, Nils 21, 198
- Lasersohn, Peter 386, 402, 520, 524
- Lassiter, Daniel 28, 29, 289, 312, 323,
531, 532
- Lechner, Winfried 455, 456
- Leech, Geoffrey N. 158, 287, 372, 380,
386, 430, 444
- Lehmann, Christian 253, 255, 541
- Leiss, Elisabeth 7, 280, 542, 546, 551
- Lenz, Barbara 135, 177, 204, 364
- Letnes, Ole 487
- Levinson, Stephen 31, 336, 522
- Levinson, Stephen C. 118, 124, 125, 160,
161
- Lewis, David 495, 537, 542, 549
- Leys, Odo 305–307
- Lightfoot, David 12, 550
- Lima, José Pinto de 230, 238, 239
- López, Luis 39, 361
- Lötscher, Andreas 63, 64, 66, 67, 85, 123,
148, 165, 450
- Lyons, John 6, 26, 38, 62, 323, 334, 368,
369, 371–373, 375, 378, 380, 385,
389, 398, 402, 406, 409, 412, 415,
425, 427, 429, 432, 446, 457, 459,
461–473, 479, 481, 533
- Maché, Jakob 14, 16, 17, 21, 210, 236,
286, 297, 322, 329, 539, 546
- Maienborn, Claudia 7, 42, 220, 286, 289,
313, 317, 328, 331, 333, 549
- Maitz, Péter 177, 193
- Martin, Fabienne 31, 62, 72, 349, 525
- McDowell, Joyce 380, 389, 450, 532
- Meid, Wolfgang 9
- Menedéz-Benito, Paula 457, 458, 546
- Merchant, Jason 39
- Milan, Carlo 323
- Mitka, Walther 199, 201, 202, 267
- Mortelmans, Tanja 1, 67, 68, 70, 88, 93,
177, 178, 340, 355, 360, 455, 485
- Moscato, Vincenzo 378, 473
- Moulton, Keir 455
- Müller, Reimar 2, 543
- Müller, Stefan 37, 45, 220, 221, 223, 242,
243
- Murray, James A.H. 193, 218, 219
- Neugeborn, Wolfgang 237
- Newmeyer, Frederick J. 46, 48
- Nissenbaum, Jon 488, 535
- Nuyts, Jan 323, 380, 411, 412, 416,
424–426, 447, 454, 467–470, 475,
477, 478
- Öhlschläger, Günther 1, 25, 31–33, 38,
39, 44, 46, 48, 52, 57, 72, 73, 77, 95,
96, 98–100, 102, 108–110, 116,
118, 119, 121, 123, 128, 131–134,
141, 142, 147, 152, 155, 158, 165,
166, 169, 170, 173, 174, 176, 177,
211, 220, 250, 260, 275, 323, 368,
369, 371–374, 376, 377, 384, 385,
398–402, 405, 411, 416, 426, 431,
453, 456, 459, 460, 467–469,
471–473, 475, 483, 485, 501, 503,
527
- Ölinger, Albert 19, 257
- Ørsnes, Bjarne 54, 56, 60, 192
- Pafel, Jürgen 229, 230, 232, 235, 237
- Pagliuca, William 1, 541
- Palmer, Frank Robert 26, 45, 48, 62, 77,
109, 142, 285, 323
- Pancheva, Roumyana 431
- Papafragou, Anna 31, 124, 160, 335, 337,
378, 380, 398, 402, 406, 409–415,
419, 426, 432, 460, 467, 470, 473,
477, 483
- Paul, Hermann 43, 54, 56, 57, 177, 179,
181, 184, 203, 217, 266, 541
- Perkins, Michael R. 131, 468, 469
- Perkins, Revere Dale 1, 541
- Perlmutter, David 45
- Pfeffer, Alan J. 184, 185, 202, 204

- Pietandrea, Paola 323
 Pillot, Jean 257
 Pittner, Karin 306
 Pokorný, Julius 10
 Pollard, Carl 45, 46, 97, 137, 220
 Portner, Paul 26, 54
- Quirk, Randolph 299
- Raynaud, Franziska 95, 98, 99, 123, 131,
 168, 169, 211, 212, 285, 286, 339
 Redder, Angelika 9, 260, 272
 Reed, Susan 429, 432
 Rehbein, Jochen 33, 211
 Reiffenstein, Ingo 10, 11
 Reis, Marga 5, 31, 32, 35, 46–48, 51, 54,
 59, 77, 98–100, 108, 110, 128, 141,
 165, 166, 169, 170, 177, 184, 214,
 215, 217, 220, 238, 239, 241–245,
 248–250, 253, 275, 277, 279, 294,
 296, 305, 308, 316, 323, 337, 339,
 340, 343, 344, 348, 362, 431, 432,
 485, 489, 495, 496, 501, 504, 508,
 513, 514, 517, 536
 Remberger, Eva-Maria 100
 Richter, Frank 455
 Riemsdijk, Henk van 55–57, 361
 Rix, Helmut 10
 Roberts, Ian G. 323, 538, 550
 Rooth, Mats Edward 370
 Ross, John Robert 48, 77, 116, 323, 361,
 363
 Rossmann, Bernhard 269, 275
 Roussou, Anna 550
 Ruoff, Arno 35, 36, 147, 212
- Sag, Ivan A. 45, 46, 97, 137, 220
 Sailer, Manfred 455
 Sanders, Daniel 14, 18, 19, 178, 184,
 187, 195, 197, 198, 202, 266
 Scaffidi-Abbate, August 177–179, 183,
 184, 189–194, 202, 203, 217, 218,
 275
 Schachter, Paul 97, 137
 Schallert, Oliver 16
 Schenner, Matthias 109, 415, 499
 Scheutz, Hannes 296, 319
- Schmid, Tanja 17, 18, 194, 198
 Schoetensack, Heinrich August 18, 59,
 102, 108, 109, 124, 137, 155, 190,
 262, 263, 269
 Scholz, Ulrike 142, 396–398, 492
 Scholze-Stubenrecht, Werner 193
 Schottel, Justus Georg 257, 258
 Schulz, Dora 8, 9, 21, 31, 270, 272, 275,
 342
 Schwabe, Kerstin 39
 Selkirk, Lisa O. 369, 374
 Shopen, Tim 57
 Smirnova, Elena 244, 245, 247
 Speyer, Augustin 296
 Stalnaker, Robert 533
 Stechow, Arnim von 46–48, 50, 54, 79,
 100, 116
 Stefanowitsch, Anatol 42
 Steinbach, Markus 294, 296, 416, 546
 Steinitz, Renate 220
 Stephenson, Tamina 68, 401, 461, 520,
 524
 Sternefeld, Wolfgang 47, 48, 54, 100
 Sütterlin 266
 Sweet, Henry 18, 193, 265
 Sweetser, Eve 1, 72, 228, 229, 287, 289,
 290, 294, 296, 322, 323, 373, 378,
 384, 416, 427, 428, 472, 541
 Szumlakowski, Irene 176, 177, 210
 Szumlakowski-Morodo, Irene 54, 55, 60,
 98, 121, 170, 171
 Sæbø, Kjell Johan 292, 293, 429, 430,
 432, 440, 466
- Takahaši, Terukazu 32, 177, 184, 211,
 215
 Tancredi, Christopher 446–448, 454–456,
 458, 467–469, 471, 473
 Thümmel, Wolfgang 455
 Thráinsson, Höskuldur 110, 323, 338,
 368
 Traugott, Elizabeth Closs 1, 239, 431, 541
 Tregidgo, Philip 322
 Tronka, Krisztián 177, 193
 Truckenbrodt, Hubert 109, 138, 319, 485

- Uhmann, Susanne 294–296, 298, 302, 416, 419
- Uribe-Etxebarria, Myriam 323, 345
- Vainikka, Anne 204
- van der Auwera 1, 70, 177, 178, 288, 307, 328, 340, 360, 455, 485, 545
- Vater, Heinz 20, 32, 34, 43, 54, 55, 58, 60, 98, 124, 128, 142, 166, 169, 173, 175, 211, 220, 223, 224, 226, 228, 275, 360, 368, 401
- Verhulst, An 386, 524
- Vernaleken, Theodor 8, 31, 263, 265, 269, 275, 489
- Vikner, Sten 110, 323, 338, 368
- Vogel, Petra 59
- Wartburg, Walther von 183
- Watts, Richard J. 380, 402, 468, 469, 471, 472
- Wegener, Heide 289, 294–296, 301, 416, 417
- Weinrich, Harald 123, 152, 155, 176
- Welke, Klaus 19, 21, 22, 26, 27, 33, 37, 40, 47, 48, 77, 82, 98–100, 102, 116, 121, 123, 131, 138, 152, 154, 155, 159, 160, 166, 169, 176, 210, 218, 226, 270, 271, 275, 286, 372, 450, 456, 486, 487
- Wellwood, Alexis 288, 337, 383, 394, 411, 415, 432, 452, 482, 484
- Westmoreland, Robert R. 31, 62, 379, 474, 523, 525
- Wilder, Chris 55, 56
- Williams, Edwin 455
- Wilmanns, Wilhelm 266
- Winkler, Susanne 39, 361
- Wöllstein, Angelika 305, 308, 316, 431, 501
- Wurmbrand, Susi 25, 32–34, 41, 45, 47, 48, 50, 77, 79, 99, 100, 121, 128, 132, 165, 170, 171, 229, 237–239, 242, 247, 248, 275, 323, 335, 338, 342, 481, 503, 504, 517, 537–539
- Wurzel, Wolfgang Ullrich 17, 24, 34, 193
- Wustmann, Gustav 187, 195, 197, 198, 218
- Young-Scholten, Martha 204
- Zaefferer, Dietmar 431
- Ziegeler, Debra 31, 62, 150, 228, 286, 474, 524
- Zifonun, Gisela 8, 20, 22, 35, 41, 42, 54, 70, 95, 123, 133, 160, 175, 211, 224, 228, 272, 286, 298, 338, 342, 348, 357, 359
- Zimmermann, Malte 62, 289, 310, 335, 337, 387, 388, 392, 395, 398, 404, 409, 423, 433, 444, 484, 520
- Zoch, Irene 8

Subject index

- accommodation (rule of) 495, 537, 542
- adjective 26, 28, 42, 71, 191, 220, 230, 231, 424, 425, 469, 470, 532
- adverb 26, 50, 88, 102, 104, 107, 118, 143, 160, 164, 169, 171, 181, 224, 228, 246, 280, 289, 298, 309–316, 321, 333, 373, 380, 389, 398, 402, 403, 414, 416, 424, 425, 429, 433, 450, 455, 457, 458, 468–470, 472, 475, 480, 532
- adverbial 5, 6, 22, 63, 68, 151, 181, 280, 289, 294, 295, 298, 300, 303–312, 316–322, 333, 335, 337, 341, 371, 386–389, 402, 418, 421, 422, 425, 429, 430, 433–438, 446, 457, 469, 474, 479, 481–488, 502, 518, 532, 534–536, 539, 553
- adverbial clause 151, 289, 294, 295, 300, 303–306, 309, 316, 337, 371, 418, 421, 422, 425, 429, 430, 433–436, 438, 474, 479, 482, 484
- auxiliary 6, 12, 13, 16–23, 26–30, 34–37, 42, 55, 57, 70, 71, 89, 176–178, 181, 184, 190, 198, 212, 218–224, 237, 242, 257–277, 290, 323–326, 338–343, 345, 348, 350, 354, 355, 372, 378, 380, 389, 395, 400, 401, 419, 433, 442, 445, 446, 453, 461, 481, 486, 489, 502, 503, 508, 517, 518, 535–539, 547, 553
- future 6, 21, 220, 223, 224, 339, 341, 400, 401, 453
- modal 13, 21, 23, 26–29, 34, 37, 71, 177, 218, 219, 223, 224, 257, 262–269, 273–277, 290, 342, 348, 372, 378, 380, 389, 395, 419, 433, 442, 445, 446
- passive 42, 55, 181, 220–223, 257
- past 70, 89
- causal clause 280, 294–298, 322, 333, 416–419, 430, 482
- epistemic 297, 298, 416
- event-related 294–298, 322, 416–419, 430, 434, 482, 503
- circumstantial (modal[ity]) 1, 3, 5–7, 28, 32, 37, 48, 49, 52–58, 62, 63, 77, 84, 109, 113, 116, 119–122, 131–138, 142, 143, 146, 147, 150, 154–156, 159, 177, 178, 197, 206, 214, 220, 224, 226, 238, 250–252, 255, 256, 280, 284–290, 293, 299, 315, 321–335, 340–342, 346, 355, 361, 363, 368, 369, 372, 379, 380, 396, 397, 430, 457, 477, 479, 481, 483, 485, 492, 502, 518, 523, 535–542, 546–554
- CoDeC (condition on deictic centres) 32, 33, 35, 62, 72, 84, 109, 123, 141, 144, 146, 158, 212, 238, 250, 252, 256, 288, 341, 379, 385, 450, 518, 524–526, 530, 534, 536
- concessive epistemic modality 102, 112, 113, 141, 157–159, 165, 353, 545
- conditional 26, 66, 67, 69, 89, 90, 94, 144, 145, 152, 180, 265, 280, 289–293, 299, 321, 326, 333–337, 343, 357, 386, 396, 398, 419, 425–434, 440, 441, 463, 466, 474, 475, 481–486, 500–503, 511–513, 517, 518, 530, 534–536, 545
- conditional clause
- echoic 292, 293
- epistemic 66, 67, 290–293, 428, 501
- event-related 290–293, 335, 419, 425, 428–433, 441, 466, 481, 482, 486, 500–503, 511–513, 517, 518, 535, 536
- irrelevance 427, 433
- context shift 279, 320, 336, 340–343, 348–353, 384, 386–389, 395, 402, 405, 415, 419, 425, 436, 476, 486, 492, 495, 499–501, 514, 518, 520
- control (predicate/verb) 25, 33, 37, 38, 45–49, 54, 60, 61, 74–77, 99, 100, 110–113, 116, 133, 147, 170, 174, 184, 206, 207, 239, 241, 253, 254,

<https://doi.org/10.1515/9783110411027-012>

- 304, 307, 332, 333, 368, 489, 507,
537, 538, 541, 550
- counterfactual 63, 64–68, 70, 71, 75,
88–91, 94, 144, 145, 148, 150, 165,
235, 238, 342, 343, 345, 355, 357
- de dicto*, 45, 46, 50, 76, 116, 132, 206,
445, 452, 455
- de re*, 46, 50, 144, 386, 445, 446, 452,
455
- deictic centre 6, 31, 32, 62, 68, 72, 84,
91, 143, 158, 250, 279, 320, 321,
336, 337, 340–345, 348, 349–353,
363, 384–386, 388, 389, 394, 395,
401, 402, 405, 408–412, 414–419,
422–425, 430–433, 435–441, 444,
469, 476–478, 480–486, 491–496,
499–502, 511–513, 518, 521–526,
530, 533–539, 540, 553, 554
- directional phrase 5, 37, 38, 54–63,
75–77, 83, 100, 107, 121, 136, 137,
154, 155, 170, 171, 177, 178, 210,
220, 230, 278, 335, 360, 361, 480,
483, 518, 534, 553
- verbless 5, 38, 55–63, 75–77, 83, 100,
107, 121, 136, 137, 154, 155, 170,
171, 177, 178, 210, 278, 360, 361,
480, 483, 518, 534, 537, 553
- English V 1, 11, 12, 17, 28, 29, 39, 42,
52, 55, 64, 71, 72, 81, 130, 131, 140,
144, 158, 165, 177, 179, 193,
218–220, 224–228, 231, 239,
265–267, 276, 287–291, 294, 296,
301, 316, 323, 326, 327, 330, 340,
348, 354, 355, 361, 369, 372, 374,
378–380, 383, 389, 394, 395, 398,
402, 406, 410, 411, 415, 419, 426,
433, 434, 437, 441–448, 453,
456–458, 464, 468, 469, 482, 484,
508, 538, 542, 543, 547
- epistemic 1–7, 22, 25, 28–40, 45, 48, 50,
55, 59, 62–75, 84–95, 102,
108–113, 119–126, 128–131, 138,
141–147, 155–167, 175–179, 184,
211–220, 223–226, 228–231,
235–239, 245–256, 261, 265,
271–280, 284–299, 302, 308–363,
368–389, 392–496, 499–504,
511–526, 530–554
- epistemic modal
- objective 62, 345, 369, 371–373,
385–389, 411, 423, 426, 429, 432,
463, 464, 467, 471, 474, 480, 553
- subjective 334, 368, 369, 371, 372,
374, 375, 411, 426, 461, 463, 473
- event 5, 7, 9, 10, 14, 22, 26, 37, 45, 48,
54, 62, 75–77, 83, 84, 99–101, 107,
108, 116, 121, 122, 130, 136, 138,
142, 152–156, 159, 170–173, 184,
210, 212, 223, 226, 228, 241–253,
272, 280, 284–318, 321–338, 341,
345, 349, 351–355, 358, 362, 368,
401, 405, 416, 417–436, 440, 441,
466, 470, 477, 481–486, 492–495,
500–505, 511–518, 522, 531, 535,
536, 539, 541, 545, 546, 548–554
- argument 7, 286, 290, 294, 298, 306,
310, 313, 315, 317, 321, 327–333,
483, 549
- modifier 5, 7, 280, 286–288, 293, 304,
305, 317, 321, 324, 327–333, 368,
548–550, 553, 554
- evidential 6, 27, 62, 126, 228, 229, 377,
386, 455, 459, 467, 470, 485, 503
- focus 125, 134, 169, 225, 228, 235, 319,
320, 337, 362, 369–379, 383, 409,
450, 452, 531, 532
- contrastive 134, 169, 320, 362,
372–375, 377, 383
- verum 125, 134, 225, 228, 235, 337,
370, 371, 379
- French 130, 140, 182, 183, 216–219,
220, 257, 259, 290, 317, 322–324,
327, 345, 354, 378
- grammaticalisation 7, 34, 173, 184, 218,
247, 253, 255, 276, 464, 541, 548,
550, 551, 554
- Hierarchy of Saliency 533, 534, 540, 585
- individual level predicates (ILP) 22, 26,
73, 317, 330–332, 585

- infinitive 5, 6, 8, 10–26, 33–48, 54–63,
 70, 75–77, 80, 83, 84, 89, 95–103,
 107–116, 130, 131, 135, 137, 142,
 147, 151–155, 166–206, 209–214,
 217, 218, 220–230, 233–265,
 270–273, 276–278, 286, 306–309,
 316, 321, 322, 326, 327, 335–341,
 349, 350, 354, 364, 368, 370, 389,
 390, 396, 427, 475, 480–483,
 486–489, 502, 507, 516, 518,
 534–539, 541, 553
- infinitive complement 5, 13–25, 34, 35,
 38–44, 56–60, 63, 80, 96–98,
 110–116, 130, 135, 137, 151–155,
 168, 170, 177, 178, 180, 184, 185,
 189–204, 210, 211, 214, 217–223,
 226, 229, 230, 233, 235–241,
 245–255, 261, 262, 265, 270–273,
 277, 286, 326, 338–341, 349, 350,
 354, 364, 368, 370, 389, 480, 483,
 487, 488, 507, 516, 518, 534, 536,
 537, 541, 553
- infinitivus pro participio (IPP) 8, 9, 12–19,
 29, 33, 35, 56, 176–180, 184,
 190–200, 217, 218, 223, 236, 258,
 262, 265–268, 271, 274, 277, 278,
 342, 345, 346, 489, 508, 547
- Kimean State Predicates 7, 546, 549
- locative adverbial 280, 333
- manner adverb 280, 333
- modal base 28, 30, 118, 145, 146, 158,
 272, 345, 371, 375, 380, 384, 523
- modal force 28, 33, 77, 113, 115, 118,
 123–128, 160, 164, 219, 224, 228,
 272, 370, 371, 374, 375, 377–380,
 384, 388, 452, 456, 457, 460, 461,
 483, 523
- modal particle 50, 362, 398, 441, 444
- modal source 78, 95, 99, 121, 129, 131,
 270, 272, 340, 386, 430, 431, 522,
 523
- modal verb 1–9, 11–48, 54–58, 61–68,
 71–77, 81–88, 91–95, 99, 100, 103,
 106–110, 113, 116, 118–151, 154,
 155, 158–167, 172–179, 184, 190,
 193, 194, 198, 203, 206, 212–220,
 224–229, 235–239, 245–280,
 285–294, 298, 299, 305, 308, 310,
 313–317, 320–342, 345–355,
 357–364, 368–380, 384–389,
 392–400, 402, 405–426, 430–496,
 499–504, 511–530, 533–543,
 546–554
- traditional 4, 9, 12, 13, 16–27, 31–35,
 38, 42–45, 48, 57, 61, 118, 130,
 148, 164, 176, 177, 184, 190, 193,
 194, 198, 203, 206, 220, 226, 228,
 248, 250, 256, 257, 259–268, 277,
 279, 338, 342, 503, 541, 552
- motion verb 57, 59, 61
- necessity 4, 24, 26–31, 62, 75–86,
 91–95, 99, 100, 104, 106, 124, 128,
 130, 135, 136, 160, 164, 172, 177,
 178, 215, 219, 220, 224–228, 251,
 261–264, 270, 273, 278, 323–327,
 336, 341, 358, 369, 370, 377–379,
 383, 386, 388, 393, 394, 400, 412,
 452, 453, 456, 457, 462, 464, 466,
 471, 474, 478, 480, 482, 496, 499,
 500, 511, 513, 523, 524, 539, 542
- negation 15, 50, 65–72, 75, 81, 82, 85,
 86, 94, 102, 115, 125, 129,
 133–136, 149–154, 174, 204, 206,
 208, 212–215, 218, 219, 228, 265,
 288, 335–338, 349, 350, 359, 364,
 371–380, 383, 386, 388, 402, 448,
 454, 462, 472–475, 479, 482–484,
 503
- Norwegian 6, 55, 58, 63, 120, 142, 178,
 323, 338, 345, 361, 368, 481, 485,
 488
- noun phrase (NP) 38–43, 53, 76, 77,
 79–83, 95–97, 100, 103, 110–117,
 121, 126, 129, 147, 162, 164, 168,
 174, 178–183, 191, 206, 217–223,
 229, 231–242, 254, 285, 288, 329,
 330, 360, 364, 401, 444, 447, 449,
 452, 454–458, 489, 513, 516, 517,
 538, 541

- ordering source 28, 100, 118, 158, 523
- polyfunctional 251–253, 256, 542
- possibility 4, 7, 26–30, 33, 38, 40, 45, 46, 49–54, 60–64, 67, 70–72, 75, 81–86, 94, 95, 104, 113, 116–119, 124–126, 128, 147, 154, 158–165, 172, 175, 176, 219, 224, 250, 251, 261, 263, 264, 267, 270, 273, 278, 287, 288, 323, 326–328, 336, 338, 355, 369, 370, 374, 375–379, 383, 385, 388, 393, 394, 397, 400, 412, 447, 450, 452, 453, 456–458, 461–464, 466, 469, 471–478, 480, 482, 546, 547, 550
- prepositional phrase (PP) 22, 55, 180, 181, 239
- preterite present 8–16, 19, 20, 23, 24, 33, 34, 124, 184, 189, 190–194, 203, 219, 251, 260–268, 271, 276, 277, 395, 552
- probability 29, 30, 93, 113, 123–128, 160, 220, 224, 228, 261, 456, 531
- prohibition on vacuous quantification 358, 359, 462
- quantificational modal 54, 83
- question 31, 39, 72, 97, 110, 129, 130, 141, 189, 204, 228, 248, 291, 296, 303, 311, 314, 316–320, 334–337, 380–389, 392–396, 412, 414, 431, 462, 463, 472–476, 479, 480–486, 496–502, 518–522, 526, 533, 534
- polarity 311, 380, 383, 384, 387–389, 394, 395, 472, 482, 496
- *wh*, 39, 130, 204, 311, 319, 336, 337, 385, 389, 392, 394, 395, 482, 496, 497, 533
- raising (predicate/verb) 15–18, 21–25, 37, 38, 45, 48, 49, 52, 54, 60, 61, 75–81, 100–104, 106, 107, 110–113, 116, 118, 122, 132, 135, 136, 141, 147, 154, 155, 158, 171–173, 177, 178, 183, 184, 191, 203, 206, 207, 210, 211, 217, 220, 222, 229, 230, 235–239, 242–249, 252–255, 258, 276–278, 341, 368, 371, 424, 454–456, 459, 503, 504, 507, 508, 511–514, 517, 537–539, 541
- reportative modal(ity) 35, 140, 142, 174, 251, 284, 499, 528, 529, 533, 540
- rule of accommodation 495, 537, 542
- semantic role 46, 80, 99, 111, 118, 133, 368
- Spanish 216, 239, 323, 327, 345, 348, 373, 426, 504, 505
- stage-level predicate (SLP) 317, 331, 332
- subjunctive 11, 21, 33, 63–71, 75, 85, 86–95, 113, 119, 122, 128, 129, 140–150, 164–166, 176, 180, 189–193, 218, 219, 251, 253, 260, 262, 266, 270, 273, 275, 287, 326, 339, 342, 343, 345, 355, 357, 378, 432, 448, 449, 483, 489, 503, 504, 508, 525, 543, 546, 547, 550
- tense 10–13, 19, 26, 35, 56, 140, 176, 180, 190, 193, 212, 220, 223, 224, 248, 257–264, 277, 317, 321, 324, 342, 345, 348, 349, 353–355, 370, 481, 486, 489–492, 495, 502–504, 507, 508, 514–518, 547, 553
- future 220, 223, 257, 263, 264
- past 11, 12, 180, 190, 248, 277, 317, 321, 348, 349, 353, 355, 486, 495, 502, 503, 514–518
- Time of Evaluation 238, 348–351, 354, 419, 435–441, 492
- Time of Situation 348
- Time of Utterance 150, 226, 238, 286, 294, 311, 312, 321, 327, 348–351, 354, 419, 434, 436, 492, 515, 516
- Topic Time 302, 311, 348, 349, 351, 353, 419, 429, 433–441, 493
- traditional modal verb 4, 9, 12, 13, 16, 17, 19–27, 31–35, 38, 42–45, 48, 57, 61, 118, 130, 148, 164, 176, 177, 184, 190, 193, 194, 198, 203, 206, 220, 226, 228, 248, 250, 256–268, 277, 279, 338, 342, 503, 541, 552
- verb cluster 199, 202