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Modality and Diachronic Construction Grammar

edited by
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Modality in Diachronic Construction Grammar

Long-standing questions, new perspectives

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1. Introduction

This volume explores how Diachronic Construction Grammar can shed new light on changes in a central and well-researched domain of grammar, namely modality. Its main goal is to show how constructional analyses can help us address some of the long-standing questions that have informed discussions of modal expressions and their development, and to illustrate the processes that are involved in these developments on the basis of data from languages such as English, Finnish, French, Galician, German, and Japanese.

In the past decade, Diachronic Construction Grammar has established itself as a fruitful research enterprise that has been applied to a wide range of phenomena in language change (Bergs and Diewald 2008, De Smet 2013, Hilpert 2013, Traugott and Trousdale 2013, Barðdal et al. 2015, Smirnova and Sommerer 2020). The growing appeal of Construction Grammar in historical linguistics can be partly motivated by the fact that it provides an analytical framework for phenomena that fall outside the purview of established research traditions. For example, changes in word formation patterns combine aspects of grammaticalization and lexicalization (Brinton and Traugott 2005), but neither of the two provides a natural explanatory framework on its own. Diachronic Construction Grammar fills that gap. It is also attractive because it invites a re-conceptualization of linguistic changes that have already been the subject of intensive study. Modality is such a case. Grammatical expressions of modality have received considerable attention in linguistic work that is broadly compatible with a constructional perspective (Plank 1984, Bybee and Fleischman 1995, Fischer 2007, Bybee 2010). Many insights from that body of work are highly relevant for Diachronic Construction Grammar, including, for example, the observation of cross-linguistic regularities in the way markers of modality grammaticalize (Traugott 1989). It has further been investigated how modal expressions develop new meanings that co-exist with older ones in synchronic usage

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(van der Auwera and Plungian 1998). Other work has addressed how grammatical markers of modality organize themselves into paradigms (Nørgård-Sørensen et al. 2011), and how new forms integrate themselves into established paradigms (Krug 2000). Research on subjectivity and intersubjectivity has further brought to light how modal expressions acquire and maintain functions that manage speaker attitudes and speaker-hearer relations (Narrog 2012). Analyses that adopt a constructional perspective on modality can build on these results and thus have a broad empirical and theoretical foundation that invites further research.

The studies in this volume are organized around three interrelated topics. The first of these concerns the organization of modal constructions in a network. Modal auxiliaries in languages such as English or German are prime examples of constructions that are organized in a tight paradigmatic structure (Diewald and Smirnova 2012). How paradigmatically related structures are adequately modeled in a constructionist framework has been a topic of considerable recent interest. Cappelle (2006) has proposed the concept of 'allostructions', and there is evidence that speakers form generalizations across paradigmatically related constructions (Perek 2015). It is thus possible to conceive of paradigms as meta-constructions that are represented in speakers' knowledge of language, as for instance proposed by Diewald (2020). In the context of this on-going discussion, the diachrony of modal constructions is an ideal test bed for hypotheses about the network organization of constructions. In this volume, the contribution by Daugs addresses paradigmatic relations between English modal auxiliaries and their contracted variants on the basis of corpus data. Whereas the equivalence of full and contracted forms is often taken for granted, Daugs argues for a more nuanced view in which the variants are constructions in their own right that are mutually connected. Another perspective on paradigmatic relations between constructions is presented by Smirnova, who investigates reported directive clauses in German. She argues for the recognition of two different types of connections. On the one hand, there are connections between close variants, such as the ones studied by Daugs. On the other, there are connections between constructions that encode semantic oppositions. Both instantiate horizontal links in the constructional network, and both are relevant for the organization of modal expressions. Links between constructions also play a significant role in Yuasa's study of the Japanese *koto*-imperative construction. Yuasa argues that central characteristics of the *koto*-imperative arise as a matter of an inheritance relation with the Japanese modal raising-to-subject construction. Yet another type of link in the constructional network is relevant in the contribution by Diewald, Dekalo, and Czicza, who turn to the methodological tool of collostructional analysis (Stefanowitsch and Gries 2003) to analyze typical collocates of the German verb *verdienen* 'earn, deserve'. Associative links between constructions and the lexical items that appear within them constitute an important part of the constructional

network, and semantic differences between a lexical source construction and its grammaticalized counterpart tend to be reflected in patterns of association with different sets of lexical items. The discussion of how links structure the constructional network is an ongoing one (Diessel 2019, Sommerer and Smirnova 2020), and the contributions in this volume highlight some of the multiple aspects that are at stake.

A second focus area of the studies in this volume concerns the developmental pathways that modal constructions follow diachronically with regard to their forms and meanings. Work in typology and grammaticalization has produced far-reaching insights into the historical changes and possible paths of development that can be observed with modal constructions (Traugott 1989, Van der Auwera and Plungian 1998). A particular strength of that work is that it has brought forth predictions that can be tested against empirical data. In this volume, Míguez engages with one such prediction, namely the hypothesis of unidirectionality in grammatical semantic change, specifically as applied to the emergence of epistemic and intersubjective meanings (Traugott and Dasher 2002). Míguez presents data from Galician that do not fit established semantic pathways and thus necessitate a new perspective on the development of intersubjectivity. The contribution by Peltola illustrates the usefulness of cross-linguistic comparisons for the analysis of semantic pathways. Peltola focuses on French *pouvoir* 'can' and Finnish *pitää* 'should', two modal verbs that have acquired meanings that express the subjectified meaning of unexpectedness. While their respective source meanings are different, Peltola identifies the contexts of usage that have permitted them to converge on similar post-modal meanings. Semantic and syntactic variation lies at the center of Dekalo's contribution, which studies two German verbs that are compared with regard to their relative degrees of grammaticalization. By integrating different formal and functional measures, the analysis shows that progressive grammaticalization does not always involve parallel developments in all relevant measures. The studies in this volume that address semantic pathways show that constructional research is eager to take up and test hypotheses from grammaticalization theory. At the same time, a recurring result seems to be that proposed generalizations need to be reconsidered in the light of cases that do not follow the general trend. The focus on individual constructions and their idiosyncrasies naturally favors a perspective in which the differences appear more important than the commonalities.

The third topic that ties the contributions of this volume together is the contrast between constructionalization and constructional change. This distinction is made by Traugott and Trousdale (2013), who present a thorough re-conceptualization of language change in terms of developments that can happen in a network of constructions. In particular, they distinguish the emergence of new nodes (constructionalization) from alterations in existing nodes (constructional change), and they differentiate between the constructionalization of elements with contentful

and procedural meanings. The perspective that Traugott and Trousdale (2013) provide is applied by Míguez, who views the development of the Galician adverbs *certamente* 'certainly' and *seguramente* 'surely' as a sequence of several processes of constructionalization and constructional change that involve a decrease in compositionality and result in the formation of nodes with procedural meaning. The notion of constructionalization is also a central element in Yuasa's study of the Japanese *koto*-imperative, which instantiates a combination of a new meaning with a new form. Yuasa works out how pragmatic strengthening and syntactic inheritance come together in this process. Diewald, Dekalo and Czicza discuss Traugott and Trousdale's term of constructionalization critically and argue that its definition ought to center on the presence of a new connection between a form and meaning. The focus on previously unattested connections is crucial for their analysis of German *verdienen* and its diachronic development. What the studies show collectively is that Traugott and Trousdale's (2013) terms continue to inspire applications, discussions, and criticism. Prompted by Traugott and Trousdale's suggestions, Diachronic Construction Grammar as a framework is evolving. The following section highlights the central points of each contribution to this volume.

2. The contributions in this volume

Robert Daugs focuses on an under-investigated aspect of the English modal auxiliaries, namely their contractions, which are often assumed to be mere equivalents of the full forms. Corpus analyses of the three contracted modals *can't, won't* and *'d* show that these forms are sufficiently different from their non-contracted counterparts, which in turn supports the view that they need to be recognized as constructions in their own right. Daugs offers three types of evidence that motivates this conclusion. First, there are distributional differences. For example, *can't* and *cannot* differ in their ability to be used question-initially (*Can't you see?* / **Cannot you see?*). Second, diachronic data from the COHA shows that the contracted forms have gained in relative frequency. Third, full and contracted forms show diverging collocational preferences that become more pronounced as time goes on. For example, Daugs observes a widening asymmetry between *won't* and *will not*, the latter of which increasingly gravitates towards verbs of permission or refusal, as in *will not allow, will not tolerate*, and *will not deny*. Conversely, *won't* increases its preference for verbs such as *mind* or *bother*, which indicates mental dispositions towards a state of affairs. Daugs discusses what these observations imply for constructional network models of the English modal auxiliaries. Given the idiosyncrasies of individual modal forms, it is in fact problematic to conduct analyses in which a given

modal auxiliary is studied on the basis of aggregated data from several different forms. Naturally, this makes the task of the analyst much more complex.

Volodymyr Dekalo addresses the important question of how degrees of grammaticalization can be measured on the basis of historical corpus data (cf. Correia Saavedra 2019). He observes that many studies in Diachronic Construction Grammar have utilized the notion of host-class expansion, which Himmelmann (2004: 32) defines as an increase in the range of contexts in which a construction can be used. In corpus-based research, progressive host-class expansion has been operationalized in terms of growing type frequencies. For example, lexical verbs that undergo grammaticalization can be shown to occur with larger and semantically more diverse sets of lexical verbs (Coussé 2014, Neels 2015). Dekalo critically examines the idea that host-class expansion is a reliable indicator of increasing degrees of grammaticalization, and he shows that this is not always the case. His empirical case study focuses on the two German verbs *wissen* 'know' and *verstehen* 'understand'. Both of these verbs have grammaticalized into markers of dynamic modality, so that they function as auxiliaries that encode the meaning of 'being able to do something'. Corpus data show that the two auxiliaries do not differ substantially in terms of their type frequency. Both occur with large sets of lexical verbs. Other structural and functional criteria do, however, distinguish between the two. Dekalo examines three factors, namely subject animacy, the relative position of the auxiliary and its lexical verbal complement, and the use of the auxiliaries with morphological or periphrastic tense markers. A quantitative analysis of these features shows that *wissen* has grammaticalized to a stronger degree than *verstehen*. Based on these observations, Dekalo cautions against the assumption that increasing degrees of grammaticalization will always be reflected by host-class expansion.

Gabriele Diewald, Volodymyr Dekalo and Dániel Czicza take a look at the synchronic variation in the lexical and grammatical environments of the German lexical verb *verdienen* 'earn', 'deserve', which they argue is being grammaticalized into an auxiliary of deontic modality. From a large corpus of twentieth-century German, the authors extract four constructions with this verb. In two constructions, which they consider lexical, *verdienen* co-occurs with an object noun phrase whose head is either concrete (e.g. *Geld* 'money'), in which case *verdienen* means 'earn', or, more commonly, abstract (e.g. *Beachtung* 'attention'), with *verdienen* then glossed as 'deserve' (cf. *This book deserves wide attention* in English). In two further constructions that are far less frequent and that Diewald, Dekalo and Czicza call grammatical, *verdienen* is followed by a passive infinitive (similarly to English *Two facts deserve to be highlighted*) or, even more rarely, an active infinitive (similarly to English *Their music deserves to live on for generations*). For each construction, the authors run collostructional analyses to find the most strongly attracted lexical items – the nouns and verbs

governed by *verdienen* in its lexical and grammatical patterns, respectively – and they group them into semantic classes, in order to get a clearer idea of the central tendency in usage behavior of *verdienen* in each construction. Diewald, Dekalo and Czicza further assume that these four synchronically available constructions are stages in a grammaticalization process that can be viewed in terms of host-class expansion (cf. Himmelmann 2004), whereby the collexemes of *verdienen* (its hosts) expand their semantic class from concrete to abstract and their morpho-syntactic class from nominal to infinitival complement and subsequently from passive to active. In this respect, the authors' study embraces the claim that synchronic distribution can serve as a window on diachronic development (Kuteva 2001: 9). Diewald, Dekalo and Czicza point out that *verdienen*'s proposed direction of change, from lexical verb to deontic auxiliary, is not unique: a similar development has been noted in the literature for other Germanic verbs whose original lexical meanings involve ideas of 'getting' 'obtaining', 'owing someone' or 'belonging to'.

Vitor Míguez presents a diachronic corpus study of the two Galician adverbs *certamente* 'certainly' and *seguramente* 'surely'. The analysis applies Traugott and Trousdale's (2013) framework of constructionalization to the development of these adverbs, as it unfolded from medieval times to the present day. The semantic trajectories of the two adverbs involve notions of manner, epistemic modality, and intersubjective meanings. Míguez studies the two adverbs on the basis of three corpora, the *Tesouro Medieval Informatizado da Lingua Galega* (TMILG) for medieval data, the *Tesouro Informatizado da Lingua Galega* (TILG) for early contemporary data, and the *Corpus de Referencia do Galego Actual* (CORGA) for present-day data. Contextualized examples of the adverbs are extracted from the corpora and categorized semantically into uses that express manner (e.g. *andar seguramente* 'walk safely'), epistemic modality (e.g. *Seguramente era unha pedra votiva* 'It most probably was a votive stone'), emphasis (e.g. *Segurament, ben pareçía caualleyro* 'Surely, he looked like a knight'), and confirmation requests (e.g. *¿E seguramente irá hoxe ao baile?* 'And surely he will go to the ball today?'). Interestingly, the diachronic developments of *certamente* and *seguramente* call into question a strict unidirectional cline from non-subjective to subjective and intersubjective meanings (Traugott and Dasher 2002). Míguez presents evidence that suggests that *certamente* and *seguramente* exhibited intersubjective meanings before they were used with epistemic modal meanings. Furthermore, *seguramente* shows a semantic trajectory that can be described as a case of de-intersubjectification, as its pragmatic uses give way to the expression of probability. Míguez calls for further research that investigates when and why epistemic and evidential markers evolve through stages that do not reflect the standard pathways of subjectification and intersubjectification.

Rea Peltola's chapter is a detailed investigation of the grammaticalization paths taken by two modal auxiliaries, French *pouvoir* 'can' and Finnish *pitää* 'should'.

These verbs have developed bleached, no-longer-modal uses (called 'postmodal' functions, cf. van der Auwera and Plungian 1998) in complement clauses after expressions of cognition or stance, similarly to *should* in *It's funny you should say that*. For both French and Finnish, Peltola describes the meaning of the whole construction – matrix clause and complement clause – as denoting a mismatch between what could have been expected and what actually happens. She argues, however, that this unexpectedness is construed differently by *pouvoir* and *pitää*. Thus, while *pouvoir* and *pitää* both end up in constructions expressing (typically unpleasant) surprise, they do so coming from different pasts, which remain reflected in the contexts in which we find the verbs' postmodal uses. Given that *pouvoir* is essentially a modal of possibility, its postmodal use focuses on the procedural meaning of mentally 'allowing' for the reality of an event whose non-occurrence would have been more likely. Corpus evidence shows that the matrix clause often includes a marker of epistemicity and/or negation, as in *C'est incroyable que la guerre puisse être finie* 'It's incredible that the war should be over.' Postmodal *pitää* is argued to bring another aspect to the fore. Being originally a modal of necessity, it portrays the event of the complement clause as one that is inevitably and uniquely selected among a range of alternative scenarios, as when the matrix contains an expression of fatality, such as *kova onni* 'hard luck', or the complement clause an expression of coincidence, such as *sattua* 'happen to.' Using Finnish data from internet discussions, dialect recordings and literature, Peltola finds that matrix clauses contain fewer epistemic and negative markers than in the French data and more axiological expressions, relating to the transgression of what is considered acceptable. Peltola thereby stresses the importance of looking at the critical contexts (cf. Diewald 2006, Hilpert 2016) that are cross-linguistically attested triggers for grammaticalization into postmodal markers. She also shows that with the fading of the possibility/necessity meanings, the modals contribute to semantic cohesion between the matrix and the complement clause. The use of the subjunctive in the complement clause in French is a manifestation of this tightened link.

Elena Smirnova's contribution focuses on horizontal links between constructions. How sets of constructions are interconnected is a matter of considerable current interest (Diessel 2019, Smirnova and Sommerer 2020, Zehentner and Traugott 2020), and it is of particular significance in the grammatical domain of modality, which is characterized by tight paradigmatic organization. Smirnova's paper addresses this topic in the context of reported directive clauses in German. She investigates the recent history of these constructions against the background of their overarching paradigm. The concept of horizontal links is central to this approach. Smirnova notes that the concept has been defined in two diverging ways. On the one hand, researchers have used it to come to terms with functionally equivalent forms that serve as mutual alternatives or so-called allostructions. One such

example is the English particle verb construction, which shows variation in the placement of the particle (Cappelle 2006). On the other hand, horizontal links have been posited as connections between forms that encode paradigmatic distinctions, such as singular and plural. These constructions are not functionally equivalent, but rather they distinguish between semantic oppositions. On the basis of corpus data, Smirnova shows that both types of horizontal links are at work in reported directive clauses in German. Whereas reported directive clauses can take a variety of morphosyntactic shapes, evidence from usage shows that one type, namely non-finite clauses with the infinitive marker *zu*, has been on the rise. This reflects a change in the network of allostructions. With regard to paradigmatic links, Smirnova shows that the same type of complement clause may be interpreted either as a reported directive or as a reported utterance, depending on the matrix verb that is used. The two constructions are identical in their syntactic structures, but the different matrix verbs serve as markers of a paradigmatic opposition. Smirnova argues that these different types of horizontal links need to be recognized in order to develop adequate models of constructional networks. While both are crucially involved in the emergence of higher-order schemata (Hilpert 2019), they differ in the way they motivate these generalizations.

Etsuyo Yuasa analyses *koto*-imperatives in Japanese and explains their path of development in terms of constructionalization. *Koto*-imperatives have been argued to have developed from imperatives with explicit verbs of command whereby the complementizer *koto* (followed by the accusative marker *-o*) was pragmatically strengthened into a sentence-final particle that encodes command (Okamoto 1995). Yuasa shows that this process involved structural change through which the *koto*-imperative inherited the syntactic structure of the raising-to-subject modal construction. She argues that *koto*-imperatives, while sharing fundamental properties with canonical imperatives, constitute a subclass that is semantically different from imperatives with explicit verbs of command. First, the contexts of use of *koto*-imperatives are typically rules and regulations (rather than court decisions and laws, the explicitly authoritative contexts of use of imperatives with explicit verbs of command). Also, unlike regular imperatives, which can communicate non-imperative meanings, such as a wish, a condemnation or a permission in specific contexts, *koto*-imperatives always express commands. Because of the raising-to-subject structural neo-analysis (in the sense of Traugott and Trousdale 2013) and the conventionalization of the meaning of command, *koto*-imperatives are considered a case of constructionalization. In the final part of the chapter, Yuasa broadens the scope and argues that *koto*-imperatives are not unlike the 'inference-intensive' readings found in suspended clauses, various types of reduced clauses that have developed from complex source structures and that often get new

modal meanings. Suspended clauses have been argued to devices that mitigate face-threatening acts: in order to avoid threatening the hearer's face, a speaker may choose not to use a main clause that makes the face-threatening speech act explicit, and to use a suspended clause instead, which requires more extensive inferencing. *Koto*-imperatives can be considered as a member of this category of suspended clauses, and the latter are hypothesized to likewise result from a process of constructionalization in the same way as *koto*-imperatives do. In this way, the final observations in Yuasa's chapter link constructionalization with the broader phenomenon of suspended clauses.

3. Concluding remarks

We believe that the studies in this collection can stand on their own merits, but we also hope that the context of this volume underscores their relevance for other current work in Diachronic Construction Grammar. Their mutual focus on modality in diachrony from a constructional perspective will be useful to readers for at least two reasons. First, the contributions reveal what new insights a constructional perspective can offer to a field of inquiry that is already well-established. Construction Grammar, as a matter of its intellectual heritage, has underscored the importance of phenomena at the periphery of grammar. Modality, by contrast, is typically considered a central grammatical domain. As the studies in this volume show, that centrality is in no way detrimental to the usefulness of constructional approaches. On the contrary, notions such as constructionalization and constructional change serve to capture important aspects of how modal expressions develop and change over time. Second, by showing that Diachronic Construction Grammar can make a meaningful contribution to the study of modality in historical linguistics, we hope to stimulate further growth in this area of research. The studies in this book address topics of general interest and document empirical phenomena that are relevant beyond the confines of a constructional analysis. We are therefore convinced that the contributions in this volume will appeal even to researchers who are working in other theoretical frameworks.

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Contractions, constructions and constructional change

Investigating the constructionhood of English modal contractions from a diachronic perspective

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In this paper, I argue that construction grammarians may have to consider integrating modal contractions into the English modal system as distinct constructions rather than variants of their uncontracted forms. Based on data from COHA, it can be shown that the contractions investigated here have emancipated themselves from the full forms both in terms of relative usage frequency as well as function over the past two centuries, thus yielding a series of constructional changes. From a usage-based, constructionist perspective, these results contribute to modelling the modal network as possibly represented in the minds of speakers, but they also support the understanding that this network appears to be much more heterogeneous than perhaps desired (by some linguists).

Keywords: modal contractions, Construction Grammar, constructional change, COHA

1. Introduction

The English core modals (e.g. *will, can, may*) represent a rather well-defined verbal category with distinct morphosyntactic properties (Huddleston, 1980; Quirk et al., 1985, pp. 135–137), of which their ability to have contracted forms (e.g. *'ll, can't*) serves as the starting point for the present paper. It is firmly established in the literature that these contractions are an exemplary case of later stage grammaticalization (Givón, 1979; Heine, 1993; Hopper & Traugott, 2003), having emerged through an increase in overall usage frequency of their full forms that eventually led to automatization and reduction (Bybee, 2006, 2010). Unlike the full modals, which have received considerable attention from numerous perspectives, their contractions

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are hardly ever discussed as anything more than mere eroded colloquial variants. By contrast, only a handful of corpus-based studies have recognized differences between the contraction *'ll* and its corresponding full forms *will* and *shall* that go beyond purely formal criteria, relating to distributional changes (e.g. Axelsson, 1998; Berglund, 2005) and meaning (e.g. Nesselhauf, 2010, 2014). As will be shown, *'ll* is not an isolated case, but its conspicuous behavior seems to be mirrored by other modal contractions and, what is more, it can be explained quite naturally from a constructionist perspective.

Over the last 20 years or so, Construction Grammar (CxG) has been engaging in various linguistic domains outside its traditional syntactic comfort zone (for an overview, see e.g. Hoffmann & Trousdale, 2013), establishing itself as a fruitful approach to language as a whole.[1] Modality, on the other hand, despite having been studied from many different theoretical perspectives for decades, is still relatively underexplored within this framework. The modal system's underlying heterogeneity (both synchronic and diachronic) remains a challenge for constructionist approaches, as it is yet to be agreed upon how modal meanings can be adequately described and how modal constructions and their meanings emerge and change over time. These issues are inherently tied to an understanding of what actually constitutes a modal construction and, accordingly, how many modal constructions can be identified. Especially the latter question will be addressed in this paper, as it has not yet been made explicit in the CxG literature how exactly the contracted forms of the modals fit in the modal network. In line with the principles of usage-based CxG (Croft, 2001; Goldberg, 2006), it will be argued that modal contractions may be viewed as constructions (cxns) in their own right, that is, as entrenched form-meaning pairings (Croft & Cruse, 2004; Langacker, 2005; *inter alia*) that exhibit structural as well as functional idiosyncrasies and also occur with sufficient frequency (Goldberg, 1995; Goldberg, 2006).[2] Based on data obtained from the *Corpus of Historical American English* (COHA; Davies, 2010), two main properties of three contracted English modals, namely *can't, won't* and *'d*, are investigated to underscore their status as cxns independent of their historically related full forms *cannot, will not* and *would*. The first property relates to the relative frequency distribution of contracted to uncontracted forms. There is a general consensus that the English modals continue to be in a phase of long-lasting change (Biber, 2004;

1. This term is somewhat misleading, as it suggests a single unified theory of Construction Grammar, which does not exist as such.

2. Note that neither Croft's nor Goldberg's versions of CxG are actually termed 'usage-based Construction Grammar', but 'Radical Construction Grammar' and 'Cognitive Construction Grammar' respectively. However, since both adhere strongly to the principles of usage-based linguistics (for a detailed discussion, see Diessel, 2015), this term will be used instead.

Daugs, 2017; Hilpert, 2008, 2012; Leech, 2013; Mair, 2015; Millar, 2009). A closer look at developmental trends of contracted modals clearly indicates an increase in their relative usage frequency over the past 200 years up to the point where they either have already surpassed or are on the verge of surpassing their respective full forms, which suggests noteworthy changes in the constructional network (Hilpert, 2013a, p. 17, 2013b, pp. 461–463). This increase can be linked to a second property, which concerns the functional idiosyncrasies they appear to have developed since the early 19th century. Next to a preference for accompanying monosyllabic verb infinitives, the contractions have shifted towards specifically attracting cognitive and emotive verbs (e.g. *mind, like, believe*). Finally, a close semantic analysis reveals that each contraction, relative to its full form, has a distinctive preference for its own functional context (i.e. the type of modality expressed). In combination, the increase in relative frequency, the changes in the collostructional behavior as well as their function and the obvious formal differences between contracted and uncontracted forms underscore their status as cxns.

The paper is structured as follows. Section 2 provides a concise summary of how modal contractions have been dealt with in textbooks, grammars and corpus studies thus far. The claim that modal contractions are distinct cxns will then be fleshed out in Section 3 by focusing on their formal properties, distributional changes and collocational/functional preferences. I will also briefly outline the methods employed for my investigation and justify the choice of corpus and genre used. Finally, in Section 4, the results from the corpus analyses are incorporated into a discussion on modal contractions and constructional changes. In sum, the findings are expected to contribute to modelling the complex network of modal expressions.

2. English modal verb contractions across textbooks, grammars and corpus-based studies

This section briefly rehearses the tenor in the literature regarding the relationship between modal verbs and their reduced forms before turning to the studies that specifically analyzed the distributional and functional behavior of selected modal contractions. Particular attention will be paid to Bergs (2008) and Nesselhauf (2014), who investigated *shan't* and *'ll* respectively from a constructionist perspective.

Academic textbooks on (modal) verbs or clitics typically treat English modal contractions as colloquial variants (Leech, 2004, pp. 51, 80) that, "[i]n terms of their function and meaning, […] are essentially the same thing [as their respective full form]" (Spencer & Luís, 2012, p. 1). This is also picked up in pedagogical grammars and usage guides, but with a more prescriptive tone that stresses the importance of limiting the use of contractions to speech or informal writing (see e.g. Foley &

Hall, 2012, p. 90; Swan, 2005, p. 143). Descriptive grammars obviously dispense with imposing any such usage norms, but the corpus data presented in, for example, Biber et al. (1999, pp. 1129–1132) clearly confirm a general preference for the use of (negative) verb contractions in conversation and fictional writing. Furthermore, these contractions need to be distinguished from phonological reductions that are not institutionalized in either speech or writing, such as vowel weakening in online speech production (Quirk et al., 1985, p. 123). In both Biber et al.'s and Quirk et al.'s grammars, the reduced forms of the modals, regardless of whether negative or non-negative, are recognized as enclitics with corresponding full forms. A different stance is taken by Zwicky & Pullum (1983) and Huddleston & Pullum (2002, p. 91), who consider the form *n't* a negative inflection rather than a clitic, thus suggesting that, for example, *won't* is a word-form of WILL and not the contracted form of *will not*.[3] The arguments made are that *won't* cannot be replaced by *will not* in inversion and that the phonological relationship cannot be predicted by general rule.[4] Both of these points will be discussed in more detail in Section 3.1.

Many corpus-based studies that provide data on modal verbs follow the notion that contracted and full forms are functional equivalents and thus aggregate their frequency counts (Coates, 1983; Collins, 2009; Leech, 2013; Leech et al., 2009; Smith, 2005; to name but a few). From a methodological standpoint, this procedure is plausible, as all possible variants of a linguistic variable must be captured to avoid violating the principle of (total) accountability (Labov, 1969; Leech, 1992). The present paper acknowledges this method but proposes that the frequencies of these forms should not be combined because they do not simply represent different pronunciation variants of the same variable – to put it differently, it will be argued that the choice between *will not* and *won't* (and other corresponding pairs) is lexical rather than purely morphophonological in present-day English (PDE).

The few comprehensive studies that deliberately treat (negative) verb contractions individually report, among other things, on their general preference for co-occurring subject pronouns, particularly in the first and second person (Kjellmer, 1997) and a noticeable increase in their use in the second half of the 20th century (Axelsson, 1998; Millar, 2009). In addition, Szmrecsanyi (2003) observes syntactic stratification showing that *won't* and *'ll* appear to be disfavored in syntactic dependent contexts compared to the full forms. Berglund (2005) also pays closer attention to the differences between *will* and *'ll* and further discovers slightly varying collocational patterns with regard to their most frequent infinitival collocates

3. Palmer (1990, p. 29) makes a similar suggestion, but also includes *would* and *wouldn't* in the paradigm of WILL.

4. Conversely, Huddleston & Pullum (2002) treat enclitics, such as *'ll* and *'d*, as genuine contractions.

(based on raw frequencies). However, none of the studies mentioned above suggest any meaning differences between contracted and uncontracted forms. Nesselhauf (2010), on the other hand, explicitly advises some caution stating that "it is by no means clear whether *'ll* can be regarded merely as a contracted form of *will* or whether and to what degree it leads a life of its own" (Nesselhauf, 2010, p. 170). This is followed up in Nesselhauf (2012), where she provides a close semantic analysis of *'ll* in comparison to *will* from a long-term diachronic perspective and argues that the contraction differs from its full form not only in terms of its distribution, but also its function. Based on two temporal data points selected from the British component in *ARCHER 3.1* (i.e. 1750–1799 and 1950–1999), she shows that *will* has become more specialized in expressing what she labels 'pure prediction', whereas *'ll* has developed into having two equally dominant senses in the second half of the 20th century, namely 'pure prediction' and 'intention' (Nesselhauf, 2012, pp. 95–97).

To my knowledge, there are only two studies that have thus far investigated modal verb contractions within a CxG framework. Bergs (2008) discusses the demise of *shall* and its related form *shan't* through functional condensation and suggests that both forms represent distinct, yet related cxns. Crucial to his argument are co-textual and contextual factors as part of the information stored in a cxn, that is, speakers' knowledge of *shall* and *shan't* includes knowledge of the syntactic environment and the register(s) they are commonly used or disfavored in. While *shall* only survives in legal and religious texts, interrogatives, ellipses (e.g. *Let's have a look, shall we?*) and in idioms with discourse-like function (e.g. *shall we say*), *shan't* is virtually non-existent in PDE, as it faces the dilemma of unifying two cxns with contrasting contextual information, namely the *shall* cxn, which is typically associated with formal styles, and the colloquial *n't* cxn (Bergs, 2008, p. 134).[5] The present paper agrees that both *shall* and *shan't* represent separate cxns, but it refrains from positing a *n't* cxn, since the contracted negative particle, similar to bound morphemes and enclitics, does not occur in isolation (i.e. it is not independent) and can thus not constitute a holistic form-meaning pairing on its own (Booij, 2010, p. 15). This, however, does not diminish Bergs' otherwise convincing argument regarding the functional tight spot of *shan't*, as one could postulate a cxn in the form of a semi-schematic template in which the *n't* particle is inextricably linked to an open (modal) auxiliary slot: [AUX-*n't*]. This cxn would contain the information 'informal', among other things, and, depending on which (modal) auxiliary occupies the open slot, it would either be readily acceptable and fairly frequent (e.g. *shouldn't, couldn't*) or functionally dubious and (therefore) severely marginalized (*shan't*, perhaps also *mayn't*). A shortcoming of this proposal

5. See also Hilpert (2013b) for the use of *shall* as a text-structuring device.

is that *shall* would have to undergo a change in form to instantiate the [AUX-*n't*] cxn – from /ʃæl/ (or /ʃəl/) to /ʃæ/ (or /ʃɑː/ in BrE) – a process for which there appears to be no motivation, as the discussion in Section 3.1 will demonstrate. Rather than assuming an active unification of two cxns, it seems more likely that *shan't* is simply recognized as a distinct cxn and the functional dilemma proposed by Bergs arises through *shall* and a [X-*n't*]$_{AUX}$ cxn being activated simultaneously with *shan't* during retrieval, given their morphological and semantic relatedness (cf. e.g. Bertram et al., 2000; De Jong et al., 2000).

Finally, in her (2014) paper, Nesselhauf integrates her previous findings on *'ll* into a constructionist framework and argues that, due its distribution and function different from *will*, the reduced form may be regarded as a cxn. It is doubtful that *'ll* by itself instantiates a cxn (any more than *n't* does); rather, it represents the substantive element of a variable pattern that prototypically includes two schematic slots as well, one for a subject host and one for a following bare infinitive. Yet, this is more of a theoretical issue. In practice, the semantic analyses on which her conclusions rest clearly include the wider co-text of both *will* and *'ll*, as this a necessary prerequisite for being able to identify their specific meanings in the first place. Thereby, she identifies the sense 'spontaneous decision' in her data, which appears to be much more commonly expressed by the cxn with *'ll* than *will* in present-day British English (Nesselhauf, 2014, pp. 85–86). Also, the reduced form has not only increased in its usage frequency in general since the Late Modern English period (LModE) but has spread from the speech-based register of drama to other more formal registers (Nesselhauf, 2014, pp. 80–82), a trend that is not idiosyncratic to *'ll*, but seems to hold true to some degree for other contracted modals, too (see Sections 3 and 4).

3. The constructionhood of modal contractions: Three case studies

CxGs are rather consistent when it comes to one specific defining aspect of a cxn, namely that it exhibits some kind of idiosyncratic behavior, that is, it cannot be predicted by general rule and must therefore be learned. This may either concern its form pole (e.g. the atypical combination of a preposition, a coordinator, and an adjective in *by and large*) or its meaning pole (e.g. the non-compositionality of *bite the dust*). Usage-based approaches to CxG add 'sufficient frequency' as another diagnostic for identifying cxns (cf. Goldberg 2006). The notion of 'sufficient frequency' is highly controversial, not least because it is difficult to operationalize. Since this study focusses on the onomasiological competition between contractions and full forms, relative frequency will be used as a rough approximation – and also due

to its relevance to constructional change (Hilpert, 2013a, p. 12).[6] In the following sections, modal contractions are thus measured against these three criteria: (i) formal predictability (or constraints), (ii) functional predictability and (iii) relative frequency. To demonstrate this, three modal contractions that are arguably among the clearest cases of contracted modal cxns and that have not received as much attention in the literature as *'ll* or *shan't* have been singled out. These are listed in (1).[7]

(1) a. <[*can't* V] ↔ ['inability/refusal/impossibility']>
b. <[*won't* V] ↔ ['prediction/unwillingness']>
c. <[SUBJ*'d* V] ↔ ['hypothesis/prediction/willingness']>

Each cxn in (1) consists of the contracted modal and a following bare infinitival verb, thus constituting a complex, partly schematic symbol with a specific collocational profile (Hilpert, 2008, 2016). The cxn in (1c) is a special case. As already mentioned in Section 2, the enclitic alone may not be considered a cxn by itself, given its host dependency. As a consequence, this cxn includes an additional open host slot typically occupied by a pronominal subject.

3.1 Formal properties of contracted modal cxns

The form pole of a cxn contains information about its phonological properties, its morphology and its syntactic distribution (Croft, 2001, p. 18). Accordingly, the status of cxn may be postulated if any of these formal properties cannot be explained by a more general pattern from which they inherit their behavior. With regard to the contracted modals listed in (1), this boils down to the question whether their pivotal part, namely the contraction itself, is recognized as a distinct lexical entry.[8]

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6. The relative frequencies reported here conflate changes pertaining to specific instances of a variable pattern (or schema) and changes pertaining to that pattern as a whole and must therefore be treated with some caution (cf. Stefanowitsch & Flach 2017).

7. Cxns are indicated here by using a formalism similar to the ones proposed by Booij (2010, p. 6) and Traugott & Trousdale (2013, p. 8), namely <[F] ↔ [M]>, where F represents the form pole, M the meaning (or function) pole and the symbol ↔ the correspondence link between the poles.

8. The idea that contracted modal expressions are (becoming) autonomous is not a new one and has been investigated on the basis of emerging modals, such as *gonna, wanna* and *gotta*, by Krug (2000), Boas (2004), Schmidtke (2009) and, more recently, Lorenz (2013a, 2013b, 2013c).

3.1.1 *The negative contractions* can't *and* won't

As shown in (2), both *can't* and *won't* represent cases of coalescence, which is understood here as univerbation with substance loss.

(2) a. *cannot* | /CVCVC/ > *can't* | /CVCC/
b. *will not* | /CVC‿CVC/ > *won't* | /CVCC/

The process has eventually left the contractions as monosyllabic units that exhibit diminished morphological salience, that is, the source forms are arguably no longer as clearly recognizable. Further support for this claim comes from the observed suppletion, that is, the degree of formal unrelatedness between the stems of contracted and uncontracted forms as a result of the coalescence; compare the examples in (3).

(3) a. *cannot* | /kænɑːt/ (or /kənɑːt/) > *can't* | /kæhnt/ (or /keənt/)
b. *will not* | /wɪl‿nɑːt/ > *won't* | /woʊnt/

The difference in the quality of the vowel between the respective contraction and its uncontracted form is decidedly more noticeable in the case of *won't*, where the vowel /oʊ/ is a closing diphthong, as opposed to the KIT-vowel /ɪ/ in *will*.[9] The pair *can't – cannot* represents a weaker case of suppletion. The TRAP/BATH-split, a feature typically associated with several British English dialects (and others), results in the unequivocal distinction between *can* /kæn/ and *can't* /kɑːnt/. A similar but more subtle *a*-configuration can also be found in some North American English dialects[10] (Labov et al., 2006, pp. 173–181), manifesting in a lax /æ/ in *can*(*not*) and tense /æh/ (or /eə/) in *can't*, which preserves the contrast between the two forms (Labov, 2010, pp. 316–317). Also, while the vowel in both the base and the uncontracted negative form can be reduced to schwa (/kænɑːt/ > /kənɑːt/), the contraction does not have a weak form (*/kənt/).

Formally unpredictable patterns of this kind raise the question how these contractions and their uncontracted forms are interconnected in the construct-i-con. Where both the formal and semantic relatedness is robust, language users may consider a concatenative relationship, that is, a linear arrangement of morphemes; compare the examples in (4).

(4)

does	*does not*	*does-n't*
need + V	*need not*	*need-n't*
could	*could not*	*could-n't*
might	*might not*	*might-n't*

9. Historically, the form *won't* seems to have emerged from ME *wynnot* (later *wonnot*) (*OED*: s.v. WILL, v.1).

10. New York City and the Mid-Atlantic region dialects are typically associated with having a split short-*a* system.

Such a syntagmatic process, however, would be unlikely for *won't* and *can't*, given the non-existence of individual lexical items in the form of **wo* or **ca*. An analysis that views *won't* and *can't* as truly bimorphemic (*wo-n't, ca-n't*) would require a rule that would not only have to explain the loss of form, but also the different degrees of irregular phonology. To avoid having to posit such a rule, Booij (2010, pp. 31–36, 2013, p. 264) proposes an alternative by arguing that there are paradigmatic links between conventionalized units. Accordingly, *can't* and *won't* could be stored and interconnected through subpart links with other expressions ending in *-n't*, namely the examples from the third column in (4) which, in turn, would be connected via subpart links to the examples from the second (and first) column on the basis of their respective morphologically salient stems. This network of subpart links allows speakers to form generalizations across these groups of expressions, as illustrated in Figure 1.

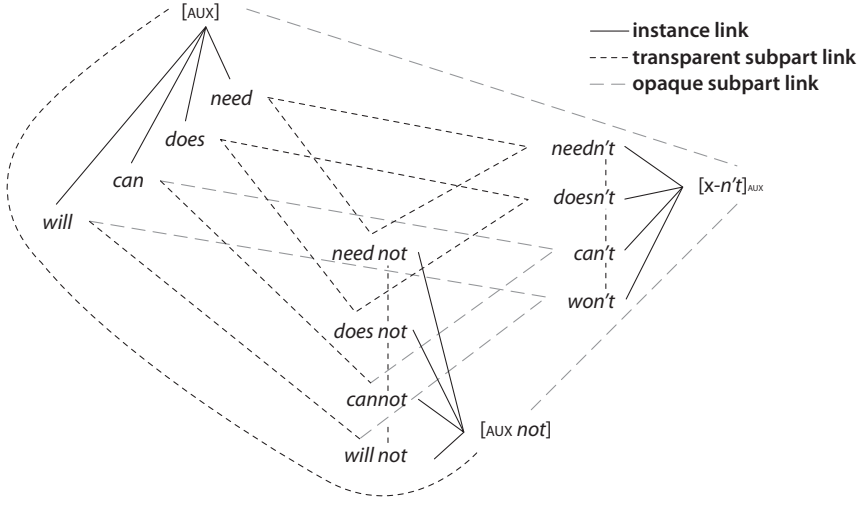

Figure 1. Simplified partial network of negative contractions and their related forms

The network shows that both *can't* and *won't* and their related forms *can, cannot* and *will, will not* respectively belong to the same group as *need, need not* and *needn't* or *does, does not* and *doesn't*. On a more schematic level, this relationship could be formalized as follows: [AUX] ≈ [AUX *not*] ≈ [X-*n't*]$_{AUX}$.[11] A distinction is made here between transparent subpart links (----) which allow speakers to parse out salient components from complex forms, for example, *need* from *needn't*, and rather

11. The symbol ≈ represents a paradigmatic link. For the sake of brevity, only the form pole of a cxn will be displayed henceforth. Note that it is debatable whether speakers actually form an abstraction in the form of [AUX]. Here, it is used as an analytical tool to describe the paradigmatic relationship.

opaque subpart links (– – –) that may restrict active parsing and leave forms such as *can't* and *won't* (also *don't, ain't, shan't*) to be processed as less complex units; see Hilpert & Diessel (2017, pp. 61–62) for a similar argument on the *let alone* cxn. As such, *can't* and *won't* are not tied as strongly to their respective full forms and may thus develop idiosyncratic preferences (whether they are formally or functionally related) more readily. This will be addressed in Sections 3.4 and 3.5.

Finally, let us consider the differences between the negative contractions and the uncontracted forms regarding their syntactic distribution. To clarify this point, compare the fabricated examples in (5).

(5) a. *Can you not annoy me, please?*
a′. *Can't you annoy me, please?*
b. *Will they not help him?*
b′. *Won't they help him?*
c. *He can obviously not help you.*
c′. *He obviously can't help you.*

It is generally the case that negative contractions remain intact in subject-auxiliary-inversion (SAI), that is, they are not split up by the subject, as can be seen in (5a′) and (5b′). This has two consequences: (i) the contractions themselves cannot be replaced here by their full form (e.g. **Will not they help him?*) (Huddleston & Pullum, 2002, p. 91); and (ii), because of this word order constraint, it is difficult to imagine a motivated process in which a sequence such as *Will they not* is chunked and eventually reduced to *Won't they*, thus providing further evidence that these contracted forms are most likely stored and retrieved holistically without recourse to the full forms. Their unit status can also be illustrated by the example in (5c′), as *can't* retains its integrity when combined with an adverb, whereas *cannot* in (5c) allows for adverb insertion. The examples in (5a) and (5a′) further demonstrate the functional consequences that may arise from using negative contractions instead of full forms in inversion, as the two sentences illustrate contradicting requests; assuming that 'not being annoyed' is the desired outcome, only (5a) would potentially achieve that. Admittedly, this contrast seems to be limited to *can't* in combination with a number of verbs that typically occur in contexts of wide scope negation (i.e. context in which the proposition rather than the modality is negated), namely transitive psych verbs (e.g. *interrupt, annoy, disappoint*), but it provides at least some evidence against the claim that modal contractions and their related full forms are identical in meaning and thus generally interchangeable.

3.1.2 *The enclitic* 'd

In contrast to the negative contractions, the enclitic *'d* is prosodically and syntactically severely restricted. The process of coalescence eventually resulted in a syllable merger between the contraction and its host. This dependency entails that *'d* itself can neither be used emphatically, nor can it occur in verb phrase ellipsis or clause-initial position, that is, function as an operator in SAI (Quirk et al., 1985, p. 123); compare the examples in (6).[12]

(6) a. *She* WOULD *make it.* | /ʃiː ˈwʊd/
a′. **She'D make it.* | */ʃiːˈd/
b. *No, but he would.*
b′. **No, but he'd.*
c. *Would they even help us?*
c′. **'D they even help us?*

These prosodic and syntactic limitations confirm that the enclitic *'d* is most likely processed as the pivotal element of a larger schema, namely [SUBJ*'d* V], whereas *would* may very well receive its own lexical entry. Next to *would*, the only other modal that has a cliticized form is *will*. As already pointed out in Section 2 and in analogy to the analyses presented for *'d*, the enclitic *'ll* also needs to be considered the fixed element of a variable pattern in the form of [SUBJ*'ll* V]. An attempt to model a partial network these cxns would belong to is presented in Figure 2.

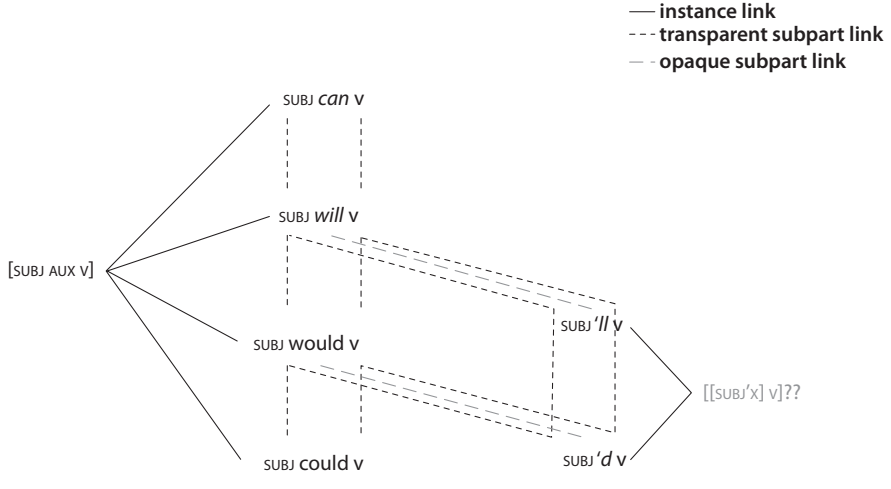

Figure 2. Simplified partial network of enclitic cxns and their related forms

12. It is possible for a sequence such as *would you do it* to be reduced to *d'you do it* | /d(ʒ)juːˈduːɪt/; but this reduction is not institutionalized, and its use would be limited to rapid speech.

The enclitics are in all likelihood connected to their full form on semantic (or functional) grounds, but they are not assumed to be actively derived from them during retrieval due to the lack of a corresponding productive deletion pattern. It is also questionable that speakers will be able to abstract a higher-level cxn in the form of [[SUBJ'X] V] from two types only.

To sum up, the contractions investigated in this study are institutionalized and not just online variations in spontaneous, rapidly produced spoken language. For the negative contractions, there seem to be no productive morphological patterns that can explain the coalescence in (2) along with either the *a*-tensing in (3a) or the diphthongization in (3b), which is why it is fair to assume that each form is generally stored and processed holistically by contemporary speakers. The deletion of /w/ and /ʊ/ in the case of *'d* renders the contraction inseparable from its host and therefore diminishes its syntactic freedom. Unlike *can't* and *won't, 'd* would not likely receive its own lexical entry, given that both its host and a following infinitival verb are required.

Despite these idiosyncrasies, it would be misleading to assume that speakers do not recognize any similarities between contracted and uncontracted forms, that is, the formal attributes discussed above are not likely to impede recognition of relatedness but may point to separate nodes in the construct-i-con (cf. Booij, 2010, pp. 250–254). If this is indeed the case, then the question arises whether the formal differences between contracted and uncontracted forms are accompanied by differences in their respective functions. This will be tested empirically in the following sections.

3.2 Corpus selection and outline for data exploration

Up to now, COHA remains the only sizable historical corpus of AmE with a total of roughly 400 million words spread over a time span that ranges from 1810 to 2009.[13] For several reasons, this paper draws mainly on data from COHA's fiction section (FIC). First, and most importantly, contractions are a spoken phenomenon to begin with, which means that we are more likely to find sufficient empirical evidence of their use in writing in less conservative, spoken-like registers. Secondly, it is expected that any form of stigmatization regarding the use of contractions in writing will have a lesser, if any, effect on fictional texts, thus yielding a more accurate picture of the actual use of modal contractions. Thirdly, much distortion in the data can be avoided ex ante by not lumping together the different genres for which COHA provides texts. And fourthly, since fictional texts are available for all

13. Note that the 1810s and 1820s are excluded from the present investigation.

data points in COHA (unlike newspaper prose), the development of contractions can be traced back further historically. Eventually, the other sections in COHA, namely newspaper prose (NEWS), popular magazines (MAG) and non-fictional books (NF), will receive some attention in light of the discussion on constructional change in Section 4. Furthermore, to do some justice to at least two issues that are often raised in contemporary corpus linguistics, namely rigor and replicability, the present paper approaches modal contractions in a more data-driven way than the studies mentioned in Section 2 above and makes use of some of the currently available corpus-linguistic methods to diachronic data. While the methodological details will be provided in the following sections alongside the respective results, a brief outline of how the data were explored is in order.

The first step involved the exhaustive data retrieval of all instantiations of the three modal cxns [*can't* V], [*won't* V] and [SUBJ*'d* V] and their corresponding uncontracted forms from COHA's online interface using the following queries: ca.[vm] n't [v?i], can.[vm] not [v?i], wo.[vm] n't [v?i], will.[vm] not [v?i], [p*] 'd.[vm] [v?i] and [p*] would.[vm] [v?i].[14] As mentioned above, it is specifically their relative frequency that is important here. It was also used as input for the variability-based neighbor clustering analysis (VNC) (Gries & Hilpert, 2008) that was carried out in step two. VNC does not only help detecting quantitative structure in diachronic corpus data (Hilpert & Gries, 2009), but it was explicitly utilized here to identify the periods for which a series of distinctive collexeme analyses (DCA) (Gries & Stefanowitsch, 2004) were conducted in the third step. As an exploratory method, DCA can be seen as an approximation towards identifying potential meaning differences between contracted and uncontracted forms, as it identifies the collexemes that best distinguish between these alternations. Based on these collexemes, random samples were drawn and manually annotated for different variables (e.g. TYPE OF MODALITY, TIME) that might affect a speaker's choice between contractions and full forms. Finally, the influence of these variables was assessed by fitting generalized linear mixed-effects models (GLMM's) (Baayen, 2008; Faraway, 2016) to the samples.

3.3 Relative frequency distribution across time

The previous section has already alluded to the importance of relative frequency for constructional change. The term 'relative frequency' refers to the probability {0,1} of encountering a linguistic unit in comparison to another in contexts where

14. The queries obviously exclude uses of contractions and their full forms in different syntactic configurations, such as inversion, adverb insertion and ellipsis. However, focusing only on the most basic (and arguably most prototypical) pattern ensures that they are at least theoretically fully interchangeable (see discussion in 3.1).

both are at least theoretically interchangeable given their functional overlap. From a constructionist perspective, shifts in relative frequency distributions possibly reflect a reorganization of the mental representations speakers have abstracted from the memorized instances of these forms and bring about a constructional change (Hilpert, 2013a, p. 17). The respective developments in the relative frequencies of the three contracted modal cxns investigated here are presented in Figure 2.

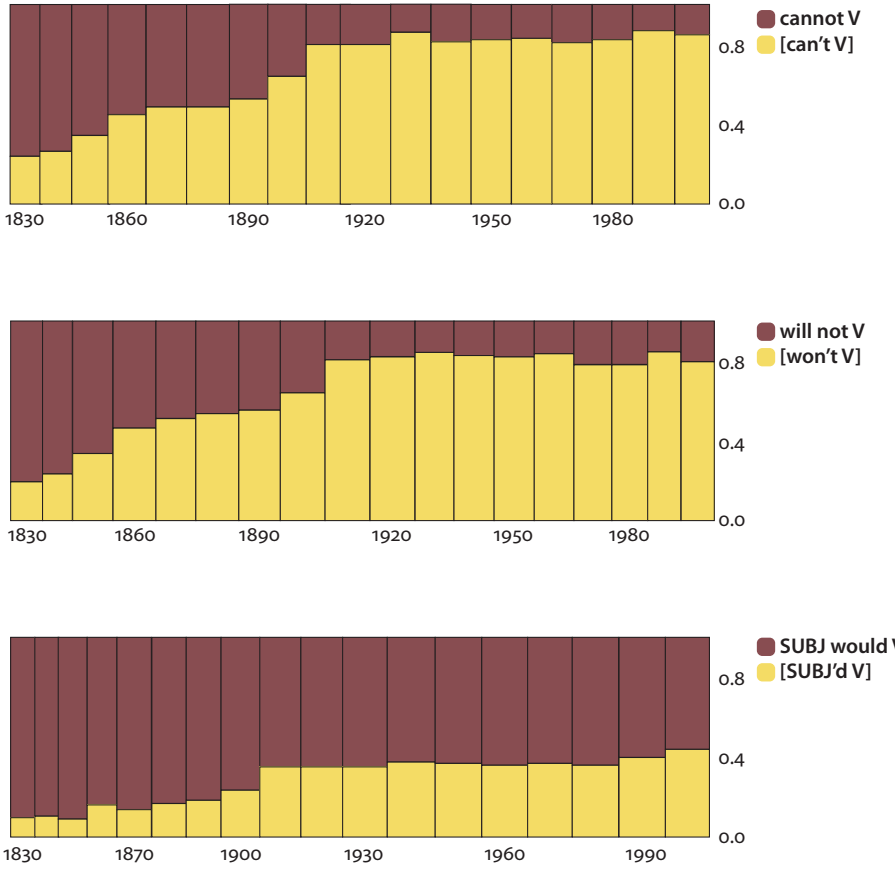

Figure 3. Changes in the frequencies of [*can't* V], [*won't* V] and [SUBJ*'d* V] relative to their full forms; COHA_FIC

From the spine plots, it is obvious that the negative contractions surpassed their full forms in usage frequency by the end of the 19th century and maintain a relative frequency of about .8 (i.e. a probability of occurrence of ca. 80%) throughout most of the 20th century. [SUBJ*'d* V] lags behind in this regard, falling just short of being at par with its full form by the 2000s. Additionally, the bar widths provide

information on the combined normalized token frequency for each pair in each decade. An increase in the relative frequency of a contraction (yellow area within a bar) coupled with an increase in bar width is thus indicative of a rearrangement of its percentage shares brought about by an actual increase in token frequency of that contraction; compare, for example, [SUBJ*'d* V] in the 1830s and 1910s. The apparent upwards trends for all three contractions are confirmed by the correlation statistics in Table 1.

Table 1. Trends in the relative development of [*can' t* V], [*won't* V] and [SUBJ*'d* V] between 1830 and 2009; COHA_FIC

	[*can't* V]	[*won't* V]	[SUBJ*'d* V]
r_τ	.84	.69	.83
$p_{\text{two-tailed}}$	<.0001	<.0001	<.0001

In order to detect frequency trends in diachronic corpus data, Hilpert & Gries (2009) recommend using Kendall's Tau (r_τ), a non-parametric rank-order correlation measure. For all three cases, the r_τ-value is larger than .50, suggesting a strong positive correlation between the variables TIME and RELATIVE FREQUENCY. What may not become obvious from simply looking at the slopes is that we actually find the weakest correlation in the case of [*won't* V], despite the relative development of the cxn being nearly congruent with that of [*can't* V] for which the correlation is the strongest. Conversely, the correlation coefficient for [SUBJ*'d* V] is almost as large as it is for [*can't* V]. In any case, the observed trends are highly significant at $p < .0001$, which provides evidence for constructional changes.

Going beyond the overall trend, the relative frequency distributions can be used as input for the VNCs in order to objectively identify the different stages of the constructional changes at hand, while reducing information complexity at the same time.[15] Thus, rather than having the time periods predetermined by the corpus (namely annual or decadal data points in COHA) or through any subjective observation on the part of the researcher (e.g. a division of the corpus into LModE and PDE components), VNC allows the researcher to partition diachronic data in a bottom-up, data-driven fashion. Figure 4 shows the respective VNC dendrogram and the corresponding scree plot for each contracted modal cxn.

15. VNCs were carried out by using the function vnc.individual() from Gries & Hilpert's (2012) R workspace {vnc.individual.RData}.

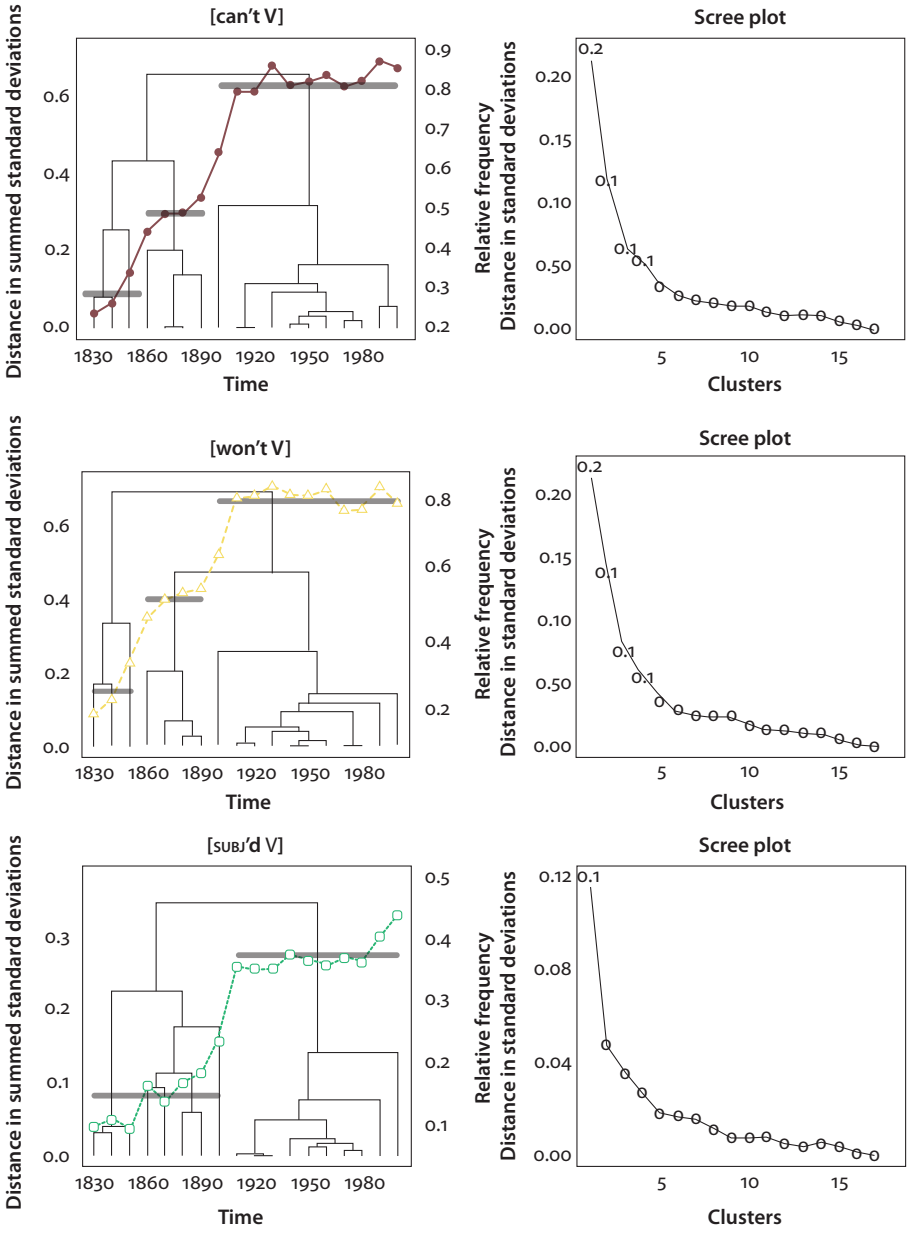

Figure 4. VNC dendrograms and corresponding scree plots over relative frequencies of [*can't* V], [*won't* V] and [SUBJ*'d* V]; grey horizontal lines indicate the developmental stages

The left-hand side depicts the different amalgamations detected by the VNCs for each case along with the respective line plots for the relative frequency distribution superimposed to the dendrograms. Here, the hierarchical clustering algorithm uses the standard deviation as similarity measure to determine in which adjacent periods the relative frequencies are similar enough for these periods to be merged into larger clusters. The accompanying scree plots next to each dendrogram help determining the 'right' number of clusters (or different stages) to be assumed within a diachronic development, that is, which clustering solution represents the best trade-off between information density and interpretability or generalizability of the results (Hilpert, 2013a, pp. 33–34). The first point of inflexion (i.e. where the scree plot shows a noticeable bend) can be used as an indicator. In the cases of [*can't* v] and [*won't* v], a three-cluster solution seems preferable; for [SUBJ*'d* v], two clusters may be assumed. The respective solutions are visualized by means of grey horizontal lines which represent the mean relative frequencies of the different diachronic stages in each VNC dendrogram in Figure 4. What becomes immediately clear is that the periodization determined by the VNC does not result in clusters that are equidistant; for example, there are three stages in the development of [*can't* v] – the first stage consists of a cluster of 30 years (1830–1859), the second of 40 years (1860–1899), and the final cluster of 110 years (1900–2009). The same clustering is proposed for [*won't* v], while the development of [SUBJ*'d* v] consist of two stages only, an 80-year cluster (1830–1909), and a 100-year cluster (1910–2009). In all three cases, much of the overall increase happened in the 19th century. From the beginning of the 20th century onwards, the relative frequencies stabilize as indicated by the long (100-plus years) final stages in the diachronic developments. The fact that the contractions have not fully ousted the full forms and that the relative frequencies stay rather constant throughout the respective final periods may point to a functional split between contracted and uncontracted forms, that is, each form occupies its own niche (cf. Hilpert, 2013b, p. 464). Whether this is actually the case will be part of the investigation presented in the following sections.

3.4 Changes in the collostructional behavior of the alternations

This section starts from the premise that changes in the (relative) frequency of a cxn can either facilitate or may be facilitated by changes in its collostructional behavior (quantitatively and possibly qualitatively) and, by extension, its meaning. To investigate this for the individual cases, a series of synchronic DCAs were performed based on the respective periodization determined by the VNCs.

In a nutshell, DCA measures the attraction (or repulsion) between a lexical item (collexeme) and a specific cxn over another functionally similar one; for example,

it can be used to detect, which infinitival verbs are more strongly associated with [*won't* v] relative to *will not* v. Although originally developed for synchronic data, Hilpert (2006) proposes the most popular diachronic adaptation of DCA in which he applies this method to a single cxn across different historical stages. The diachronic adaptation of DCA employed in this study differs from Hilpert's approach in that it focusses on the direct comparison of competing cxns through time. In other words, the distinctive collexemes of coexisting contracted and uncontracted forms for each VNC period will be compared using the original, synchronic variant of DCA.[16] The interpretation of the results therefore remains rather straightforward, with one caveat. Although the algorithm will identify which slot fillers best distinguish between the contracted modal cxns and their corresponding full forms in the respective VNC periods, the periods themselves are essentially treated as internally static. It is clear that this does not mirror actual language use accurately because the probabilistic evaluation speakers are assumed to perform over their input is a continuous, reiterating process (Stefanowitsch, 2006, p. 261). As a consequence, there is no reason to assume that collostructional preferences remain completely fixed for any period regardless of its size. While this would carry less weight with smaller clusters, some extend over the average life expectancy of a speaker, which means that it is difficult to maintain any claims to psychological plausibility here. This problem could potentially be reduced by keeping the periods as small as possible (in COHA, annual data points), but then the input needed for the DCA may in fact become too sparse to yield significant results and the overall picture would perhaps become too fragmented to be readily interpretable. Conducting VNC-based DCAs therefore represents a data-driven compromise.

The first step to carrying out the DCAs involved extracting all types of each contraction and their full form along with their respective token frequencies from COHA. Secondly, the data were cleaned up manually to account for spelling variations and scanning errors. Finally, the data were submitted to the corresponding functions from Flach's (2017) R package {collostructions}. For the negative contractions and their full forms, the negative log10-tranformed *p*-values of a Fisher-Yates exact test (FYE) were used as an association measure to calculate the collostructional strength (or 'distinctiveness'). In the case of [SUBJ*'d* V] and its uncontracted counterpart, the G^2 statistic of the log-likelihood ratio test (G^2) was employed instead, given that FYE returned infinite values for some collexemes. The output from the DCAs was then investigated for potential clusters the respective collexemes might be sorted into. The results are listed in Tables 2–4.

16. Johannsen & Flach (2015) use a similar adaptation to investigate the obligatoriness of progressive over simple verb forms in BrE from a long-term diachronic perspective. Their analysis, however, is not based on a VNC-determined periodization but fixed 70-year intervals.

Table 2. Changes in the 25 most distinctive collexemes in *cannot* v and [*can't* v]

	cannot v				[*can't* v]			
	Collex	**FYE**	**Collex**	**FYE**	**Collex**	**FYE**	**Collex**	**FYE**
1830–1859	be	27.64	brook*	2.63	**get**	49.48	**begin**	3.53
	fail	14.01	**enter***	2.63	stand	23.38	teach	3.53
	doubt	6.84	refrain*	2.49	**help**	22.49	**stop**	3.49
	know	4.61	hope	2.47	**do**	15.62	seem	3.41
	escape	4.38	suffer	2.36	**make**	10.78	have	3.41
	avoid*	4.25	forbear*	2.34	see	6.81	read	3.39
	comprehend	3.95	exist*	2.19	find	5.8	**run**	3.38
	die	3.93	**fly***	2.19	wait	5.38	attend*	3.26
	consent*	3.51	remain	1.97	afford	4.46	hurt	3.05
	love	3.34	weep*	1.90	sell	4.23	depend	3.03
	describe	3.06	forget	1.76	say	4.07	**shoot**	3.03
	choose	2.84	conceal*	1.76	tell	3.95	pay	2.93
	speak	2.69			**go**	3.72		
	cannot v				[*can't* v]			
	Collex	**FYE**	**Collex**	**FYE**	**Collex**	**FYE**	**Collex**	**FYE**
1860–1899	be	41.03	fathom*	4.66	**get**	41.73	afford	4.70
	fail	25.43	**enter**	4.65	**do**	37.43	seem	4.55
	comprehend	11.76	know	4.35	**help**	21.16	**eat**	4.53
	doubt	11.59	avoid	4.30	stand	19.32	let	4.13
	forget	7.28	love	4.15	**make**	12.05	**catch**	3.70
	accept	5.92	exist	3.98	**stop**	11.17	**talk**	3.59
	answer	5.72	**leave**	3.89	**go**	9.65	**put**	3.52
	die	5.57	hide	3.80	fool	8.72	**play**	3.40
	endure	5.46	share	3.79	have	5.70	hurt	3.23
	hope	5.40	remain	3.66	**begin**	5.46	find	3.03
	give	5.34	describe	3.43	**run**	5.44	imagine	3.00
	conceive	5.03	**follow**	3.29	keep	5.18	want	2.88
	speak	4.97			think	5.00		
	cannot v				[*can't* v]			
	Collex	**FYE**	**Collex**	**FYE**	**Collex**	**FYE**	**Collex**	**FYE**
1900–2009	be	121.81	**enter**	10.72	**get**	96.08	**take**	8.44
	permit	24.31	understand	9.67	**do**	60.85	**stop**	7.47
	fail	23.82	recall	9.51	stand	35.27	keep	6.73
	escape	18.06	die	8.99	wait	19.41	fool	6.62
	endure	16.37	alter	8.79	**help**	16.03	**beat**	6.13
	speak	15.18	choose	8.43	**talk**	15.61	have	6.01
	conceive	13.33	bear	8.42	**go**	14.67	**stay**	5.85
	know	12.31	allow	7.88	figure	13.17	blame	5.55
	remain	12.00	doubt	7.49	believe	10.73	remember	5.36
	exist	12.00	describe	7.47	let	10.60	miss	5.16
	comprehend	11.83	hope	7.22	seem	8.90	afford	4.95
	accept	11.43	live	7.13	**make**	8.80	**start**	4.70
	harm	10.72			**handle**	8.69		

verb	emotional/mental state or activity	verb	permission/approval/refusal
verb	dynamic action	*	verb not shared

Table 2 shows changes in the 25 most distinctive collexemes for the cxn [*can't* v] and its full form from the first to the final VNC cluster. As could have been expected, the increase in the relative frequency distribution of the contraction reflects an increasing acceptance that allows for more verbs to enter the cxn. While eight of the 25 distinctive collexemes for *cannot* in the first VNC period do not occur in [*can't* v] yet, all verbs listed in the final period are shared by both expressions. Regarding the semantic similarities of the respective distinctive collexemes, a first observation that can be made is that [*can't* v] has become increasingly distinctive with regard to cognitive verbs encoding an emotional/mental state or activity (e.g. *remember, believe, miss*). Thereby, the contraction seems to become more like its full form which has already been used with verbs from the same domain. At the same time, there is a strong tendency for high dynamicity action verbs to co-occur with the contraction rather than the full form. Unfortunately, neither verb type allows for a confident prediction as to what kind of functional preferences the contraction may have or has developed. For example, the function 'ability' is not generally tied to action verbs of any specific degree of dynamicity, but only to inherent properties on part of an animate subject with agentive function (Coates, 1983, pp. 89–93) – something that the DCAs do not show. Lastly, *cannot* has started to attract verbs such as *permit* and *allow*. In contrast to cognitive or action verbs, these can be expected in permissive contexts rather than situations that relate to any intrinsic abilities (or rather lack thereof) on part of the subject referent.

A somewhat similar picture is presented by [*won't* v], see Table 3. Again, relative to the full form, it is the cognitive or emotion verbs that the contraction increasingly attracts beyond chance level; see Biber et al. (1999, pp. 174–175) for a similar observation on negative contractions in general. By contrast, these verbs, apart from *wish*, are absent from the list of the top 25 distinctive collexemes of the full form in the last VNC period. Instead, *will not* has developed a strong distinctive preference for verbs that would conform well with its 'unwillingness' reading (e.g. *accept, obey, permit*). Given that these verbs are typically used in contexts where the subject referent tries to convey seriousness and determination to the interlocutor, it is plausible that the preferred choice is the potentially more emphatic, longer, more formal, uncontracted form, as illustrated by the examples in (7)–(9).

(7) I do not have to seek another; I do not intend to do so for a long time – perhaps never. I will not accept any suggestions in that direction. Do I make myself clear? [COHA, FinalPlanet, 1987]

(8) We will not do as the Romans do. We will not obey the Roman law. [COHA, Spartacus, 1958]

(9) I will not permit you to occupy Orison, making us little more than a hostage population. I do not call that an alliance. [COHA, CaptiveBride, 1987]

Table 3. Changes in the 25 most distinctive collexemes in *will not* v and [*won't* v]

	will not v				[*won't* v]			
	Collex	**FYE**	**Collex**	**FYE**	**Collex**	**FYE**	**Collex**	**FYE**
1830–1859	fail*	10.49	shrink*	2.01	do	51.1	like	2.66
	attempt*	6.84	venture*	2.01	have	14.28	take	2.57
	suffer	5.57	remain*	1.87	get	13.85	spoil	2.22
	be	3.87	repeat*	1.87	hurt	10.96	come	2.18
	permit	3.40	doubt*	1.74	let	8.74	hold	1.99
	refuse	3.23	hesitate*	1.74	want	5.56	run	1.99
	deny	3.20	dwell*	1.61	go	5.35	touch	1.77
	harm	2.82	enter*	1.61	stand	4.80	miss	1.71
	betray	2.73	fear*	1.61	pay	4.24	make	1.64
	seek*	2.54	prove*	1.61	tell	3.59	eat	1.61
	wonder*	2.54	leave	1.60	work	3.25	drink	1.46
	follow	2.11	offend	1.53	mind	3.07	believe	1.39
	yield	2.07			help	2.89		
	will not v				[*won't* v]			
	Collex	**FYE**	**Collex**	**FYE**	**Collex**	**FYE**	**Collex**	**FYE**
1860–1899	fail	14.08	dwell*	3.85	do	57.25	take	4.00
	refuse	10.15	betray	3.69	have	17.84	work	3.08
	permit	8.94	forsake	3.57	hurt	16.44	keep	2.80
	leave	8.31	speak	3.41	get	14.40	help	2.54
	return	7.80	shrink	3.28	stand	12.01	count*	2.54
	allow	5.26	detain	3.09	tell	8.35	know	2.28
	suffer	5.24	tolerate	2.99	mind	7.75	blow*	2.26
	attempt	4.54	wonder	2.92	go	6.43	bother	2.22
	accept	4.31	fear	2.70	catch	5.42	make	2.20
	desert*	4.17	serve	2.66	charge	4.62	shoot	2.19
	be	4.08	rest	2.63	want	4.46	wash*	1.98
	remain	4.02	injure*	2.57	let	4.30	play	1.84
	yield	3.96			like	4.04		
	will not v				[*won't* v]			
	Collex	**FYE**	**Collex**	**FYE**	**Collex**	**FYE**	**Collex**	**FYE**
1900–2009	permit	22.90	fight	7.80	get	46.04	take	5.06
	return	21.02	accept	7.66	have	24.18	find	4.59
	allow	18.55	betray	7.49	mind	23.05	say	4.40
	cease*	18.06	obey	6.98	do	21.19	last	4.33
	fail	16.57	die	6.72	hurt	20.51	talk	4.13
	suffer	13.15	desert	6.66	tell	17.26	matter	3.24
	tolerate	12.70	spare	6.65	let	17.04	feel	3.02
	harm	10.89	abide*	6.25	work	9.42	stand	2.93
	speak	10.09	receive	5.94	bother	9.21	make	2.44
	attempt	9.52	endure	5.82	need	6.21	start	2.41
	refuse	8.76	wish	5.82	like	5.95	shoot	2.18
	remain	8.26	deny	5.69	bite	5.77	want	2.04
	pass	7.82			know	5.36		

verb — emotional/mental state or activity

verb — permission/approval/refusal

* verb not shared

Overall, the data in this case illustrate an arguably more noticeable collexemic demarcation than could be observed for [*can't* v]. Taking both the development in the relative frequency distribution and the collostructional changes into consideration, [*won't* v] and its uncontracted form may thus qualify as a clearer case of division of labor. Also, the observation lends weight to Goldberg's (1995, p. 67) 'Principle of No Synonymy', as the distinctiveness in form (see the discussion in Section 3.1.1) correlates here positively with a (potential) distinctiveness in function.

Finally, consider the cxn [SUBJ*'d* v] in Table 4. The data from the first VNC period already suggest a potential functional split between the contraction and its full form, as the most distinctive collexemes show little semantic overlap. Falling in line with the previous observations on contractions, the enclitic also exhibits a relative preference for mental/emotive verbs (e.g. *know, love*). Moving to the second period, this observation is corroborated, given the noticeable increase in the number verbs from that domain among the contraction's top distinctive collexemes. The full form, on the other hand, remains quite stable regarding its distinctive collexemes; 18 of the 25 collexemes listed in the first period are also among the top ones in the second period. Most strikingly, the very top of the list is dominated by the same relational state verbs (e.g. *be, seem, appear*) in both periods.

A shortcoming of DCA is that it only highlights differences between alternations and provides no information on their similarities, which means that no definitive information on the cxns' actual collexemic profiles (i.e. which collexemes are most strongly attracted/repelled considering their overall occurrence in the sub-corpus) can be obtained on the basis of distinctive collexemes only. This could be overcome by performing simple collexeme analyses (SCA) (Stefanowitsch & Gries 2003) for each alternation in each VNC period followed by a pairwise comparison.[17] The reason SCAs were not carried-out here is twofold: (i) it was simply deemed too labor-intensive to retrieve the overall occurrences of the collexemes in question from COHA's online interface, given that it is not possible to obtain this information without having to conduct an unfeasible number of queries. And (ii), even if SCAs would reveal more than a few similarities between the contractions and their full forms regarding their most strongly attracted collexemes, something that would not be too surprising given the high degree of relatedness of these alternations, the purpose of this paper is to uncover the subtle differences for which DCA is sufficiently suitable.

Obviously, the results from the DCAs do not automatically translate into the type of modality expressed by each form, but the differences reported here suggest

17. As was suggested by an anonymous reviewer.

Table 4. Changes in the 25 most distinctive collexemes in SUBJ *would* V and [SUBJ*'d* V]

	SUBJ *would* V				[SUBJ*'d* V]			
	Collex	G^2	**Collex**	G^2	**Collex**	G^2	**Collex**	G^2
1830–1909	have	857.99	speak	17.17	like	3004.09	love	37.08
	be	833.28	seek	17.01	get	158.21	cut	35.87
	seem	270.5	enter*	16.78	let	158.07	lick	34.09
	appear	59.32	sound*	16.78	give	151.53	feel	33.29
	return	51.67	suppose	15.79	hate	125.27	fetch	31.53
	remain	35.52	cost	14.31	want	109.08	sell	30.62
	require	34.03	please	13.84	come	88.55	swear	30.23
	become	28.92	consent	13.50	bet	71.12	stay	29.36
	afford*	25.01	burst	13.38	put	66.93	set	28.17
	receive	24.10	escape	13.12	run	59.65	hit	26.46
	prove	21.67	pass	13.12	go	42.96	think	25.43
	suit	18.74	attempt*	13.01	know	41.35	tell	25.29
	suffer	17.76			try	38.40		
	SUBJ *would* V				[SUBJ*'d* V]			
	Collex	G^2	**Collex**	G^2	**Collex**	G^2	**Collex**	G^2
1910–2009	have	2722.10	wish	96.27	like	5265.82	've	152.93
	be	1262.98	receive	95.32	get	1109.39	run	149.88
	seem	1117.12	prove	81.26	love	807.57	call	131.27
	appear	205.30	allow	79.43	want	578.08	read	126.44
	speak	165.48	consent	77.70	come	560.76	quit	124.91
	require	164.76	yield	75.69	hate	522.94	need	118.45
	return	156.36	bear	72.66	say	506.29	tell	117.07
	remain	119.64	serve	72.29	think	351.86	guess	110.27
	suppose	114.74	make	67.01	put	340.01	start	99.01
	save	113.63	cost	64.19	let	224.49	feel	87.49
	seek	107.49	suit	60.92	hit	189.92	expect	83.76
	afford*	99.55	suffer	58.60	appreciate	187.35	pick	82.95
	please	97.69			know	172.84		

verb emotional/mental state or activity verb relational state

* verb not shared

that it is worth pursuing the idea that each expression may have distinctive functional preferences. But before turning to a closer semantic analysis, there is another collexemic property the DCA has revealed that is worth mentioning. Beyond the semantic clusters discussed above, the verbs that occur in the contracted modal cxns are also structurally different from the ones occurring with the full forms. More specifically, the collexemes that are most distinctive for the contractions (at $p < .05$) in the final VNC periods are on average .6 syllables shorter than the full forms ($M_{contr} = 1.25$, $SD_{contr} = .54$, $M_{full} = 1.85$, $SD_{full} = .68$, Welch's $t(790) = -16.767$,

$p < .0001$).[18] In a recent study, Levshina identified a correlation between slot filler informativeness and formal length of near-synonymous cxns (e.g. *want to* v vs *wanna* v), proposing that the less informative (or less surprising, i.e. more probable) a slot filler is for a given cxn, the more likely that filler is to occur with the less coded variant (Levshina, 2019, pp. 171–172). While the present study does not intend to equate informativeness of a slot filler with its length, it will still be assumed that construction length and slot filler length are somewhat connected and relevant on either prosodic and/or functional grounds, which is why slot filler length will be treated as a predictor for the analysis in Section 3.5.

3.5 Modelling speakers' choice between a contracted modal cxn and its full form

Following through with the data-driven approach implemented here thus far, the results from the DCAs inform the next methodological step. As already mentioned, DCA does not identify the different types of modality associated with each modal cxn. For example, [*can't* v] may be used to express either epistemic or non-epistemic meaning; which one it is can often not be inferred from simply looking at a bi-gram such as *can't get*, but requires more co(n)textual information, as illustrated in (10)–(12).

(10) I overslept this morning and now I can't get going.
[COHA, WhileMyPrettyOne, 1989]
'inability'/dynamic

(11) Didn't your consul general tell you what we both know? I can't get into the United States on a Nansen passport. [COHA, DangersPath, 1999]
'permission not granted'/ deontic

(12) "Well, it can't get any colder now, that's sure," Harold said.
[COHA, TownWithFunnyName, 1948]
'impossibility asserted'/epistemic

While some collexemes can reasonably be expected to occur more often in one functional context than in another, for example, *allow* in permissive/deontic or volitional/dynamic contexts and *seem* in epistemic contexts, the pervasiveness of polysemy with regard to modal expressions merits a semantic analysis beyond the differences identified by the DCAs. Nonetheless, it was deemed important

18. The numbers for the syllables were obtained using the function nsyllables() from Benoit et al.'s (2018) R package {quanteda}.

to retain the information about the lexical biases for each alternation, given that this information can be considered part of speakers' knowledge of these cxns. To this end, a sub-corpus was created consisting only of the contractions and the full forms with their respective most distinctive collexemes. From this corpus, twelve random samples with 400 example sentences each (= a total of 4,800 examples) were analyzed and annotated for TYPE OF MODALITY expressed in order to ascertain whether there are any context-dependent meaning differences and changes in the use of contracted modal cxns and their full forms when combined with the verbs for which they are maximally distinctive.[19] The different levels for the independent (or predictor) variable TYPE OF MODALITY are largely based on the tripartite distinction proposed by Huddleston & Pullum (2002, pp. 178–179), namely, deontic, dynamic and epistemic meaning. However, since such a rather coarse-grained approach will sometimes fail to adequately describe all the subtleties inherent in these functional categories, specifically the different meanings subsumed under non-epistemic modality (see e.g. Van der Auwera & Plungian, 1998; Depraetere & Reed, 2011), adjustments towards more detailed categories were made when necessary. For example, in the case of [*can't* V], dynamic modality was split further into 'ability' and 'non-deontic root possibility'. Previous corpus studies have identified these as the two most frequent meanings associated with the modal *can* in contemporary English (Coates, 1983, pp. 93, 101; Collins, 2009, pp. 98, 101). This sub-categorization may thus provide a more accurate picture of the functional differences. Other independent variables considered are TIME, SYLLABLE LENGTH OF COLLEXEME and SOURCE; for [SUBJ*'d* V] and SUBJ *would* V, additional variables concerning the properties of the subject, namely PERSON and ANIMACY, were taken into account, given the enclitic's host dependency. An excerpt from the data is shown in Figure 5; the different variables and their levels are summarized in Table 5.

19. An anonymous reviewer raised concerns regarding the validity of the results such a data selection produces compared to a random sample drawn from all instances. This concern is valid insofar that the results will be robust only for the distinctive collexemes. Yet, as discussed earlier, the aim here is to highlight the differences between contractions and full forms.

Year	Source	Context_1	Cxn	Collex	Context 2	VNC_period	Sense	Mod_ type	Syll_ collex	SUBJ_ pers	SUBJ_ animacy
1853	Ella Barnwell	I'm an old man, Simon Girty, "said Younker, in reply," and	can't	run	as I once could – so you needn't reckon on my gitting through alive.	1830-1859	inability	dyn abil	1	–	–
1852	Hatchie Guardian	You know him, do you? continued he. "" Well, no -I	can't	say	I do. """" But you have business with him?""	1830–1859	formulaic		1	–	–
1975	FiveGates Armageddon	No. I suppose it's just me being mummish. A few more hours	won't	make	any difference except to me, of course. But I expect	1900–2009	assertion	epist	1	–	–
1880	Bricks Without Straw	. "" ""But what about Red Wing?"" asked Hesden.""	I'd	like	ter see it once mo", ""said the broken-hearted man, while	1830–1909	wish/desire	dyn	1	1st	animate
2000	Courtship	I will lend you a treatise on it. Now, you	cannot	allow	Douglas -always to discipline you first.	1900–2009	permission not granted	deont	2	–	–
1953	Mov:Affair With Stranger	Excitedly she knocks on the window and calls. Her voice	cannot	be	heard, but her mouth is plainly calling, ""Bill.	1900–2009	circumst. impossibility	dyn poss	1	–	–
1921	Wild Justice Stories	"she burst out."" I'm his, Greg. I	will not	betray	my husband for any man. ""Again he besought her to go with him	1900–2009	unwillingness	dyn	2	–	–
1959	Eva	one announced, "We are now going on a journey. You	will not	speak	to anyone on the way, nor are you permitted to speak with us.	1900–2009	permission not granted	deont	1	–	–
2009	KillingWay	Arthur loved the old man like a father, and he	would	hesitate	to have him executed, hesitate until the people began to ponder whether he had	1910–2009	past prediction	epist	3	3rd	animate

Figure 5. Excerpt from the random samples with added annotation

Table 5. Summary of variable coding for random samples

VARIABLE	LEVELS
dependent	
CONSTRUCTION	contraction | full form
independent (random effect)	
SOURCE	<diverse authors/texts>
independent (fixed effects)	
TYPE OF MODALITY	epist | deont | dyn | dyn_abil | dyn_poss
SYLLABLE LENGTH OF COLLEX.	one | two | three | four
SUBJECT PERSON	1st | 2nd | 3rd
SUBJECT ANIMACY	animate | inanimate
TIME	first VNC period | final VNC period

Functionally ambiguous cases and formulaic expressions were ignored because including them would not contribute to understanding the variation between full forms and contractions. Also note that TIME only has two levels here. Since the results from the DCAs indicate a rather gradual change in the most distinctive collexemes, the 'middle' clusters for the negative contractions were excluded from further analyses. Focusing only on the first and final periods simply brings the changes that occurred more into prominence.[20]

To assess the weight or influence the different predictors have on the dependent (or response) variable CONSTRUCTION, GLMMs were fitted to the data.[21] Initially, it was determined whether assuming a random-effect structure was justified, that is, whether GLMMs with SOURCE as a random effect provide a significantly better fit for the data than fixed-effects binomial logistic regressions (GLMs). This was done by pairwise AIC (Akaike Information Criterion) comparisons of the baseline (or intercept only) GLMs and GLMMs for each case. Since the AIC-values for each GLMM were lower than for the GLMs in all three cases, the random effect was included. Following this, the final models were determined by employing a stepwise step-up procedure, that is, the predictors were added successively and retained if the fit for the updated models improved (cf. e.g. Schweinberger, 2019). This was also done for all two-way interactions of which none made it into the final models, either because their effect was not significant or including them led to multicollinearity

20. It should be noted that TIME is included here to explain the data rather than speakers' actual choice between alternations (cf. Stefanowitsch, 2006).

21. All regression models were fitted using Harrell's (2019) R package {rms}, Bates et al's (2019) R package {lme4} and several snippets from Schweinberger's (2014) script {meblr.summary.r} and (2018) script {AmpAus_Part4_20190520.R} which were kindly provided by the author.

between the predictors. The latter was tested using VIF (Variance Inflation Factor) values as an indicator; if VIF ≤ 3, collinearity was not considered an issue and the predictors in question were retained. Finally, all cases where a factor level led to complete separation of the data, that is, when a certain level of an independent variable does not occur with both levels of the dependent variable, had to be removed. The summaries for the three final minimal adequate models are listed in Tables 6–8.

Table 6. Results from the GLMM for [*can't* v]

Call

glmer	(cxn ~ mod_type + syll_coll + VNC_period + (1 | source), family = binomial, data = cant, glmerControl(optimizer = "nlminbwrap"))

Model statistics

C-Index	Somers' D_{xy}	AIC	BIC	logLik	deviance	*df*
.9725	.9450	1508.6	1550.6	−746.3	1492.6	1401

Scaled residuals:

Min	1Q	Median	3Q	Max
−6.4878	−.4304	−.1353	.3863	2.4744

Random effects

Groups	Name	Variance	*SD*	χ^2	*p*	
source	(Intercept)	4.154	2.038	117.31	<.0001	***
Number of observations:		1409				
groups:		809				

Fixed effects

	Estimate	*SE*	*Z*	*p*	
(Intercept)	1.6675	.2316	7.199	<.0001	***
mod_type=deont	−1.9015	.3225	−5.896	<.0001	***
mod_type=dyn_poss	−2.0189	.2485	−8.123	<.0001	***
mod_type=epist	−4.8057	.4955	−9.698	<.0001	***
syll_coll=three	−4.6318	.8162	−5.675	<.0001	***
syll_coll=two	−2.6531	.3376	−7.859	<.0001	***
VNC_period=1830–1859	−.7121	.2703	−2.635	.0084	**

In all three cases, the reference levels were set to the outcome that was expected to increase the odds for the respective contraction based on the DCA results and a preliminary observation of the data. For the first case this means that the intercept shows the log odds (1.6675) for [*can't* v] over *cannot* v with a monosyllabic slot filler in contexts expressing 'ability' in the period 1900–2009; see Table 6. The estimates for the remaining coefficients indicate that these factor levels decrease the odds for

the contraction significantly (other variables being controlled for). Perhaps unsurprising is the full form's clear preference for epistemic contexts, given that its most distinctive collexeme throughout every VNC period is the high frequency verb *be* which in combination with (negative) *can* typically conveys 'assertion' when used statively (Coates, 1983, pp. 44, 101).

Table 7. Results from the GLMM for [*won't* v]

Call

glmer (cxn ~ mod_type + syll_coll + VNC_period + (1 | source), family = binomial, data = wont, glmerControl(optimizer = "bobyqa"))

Model statistics

C-Index	Somers' D_{xy}	AIC	BIC	logLik	deviance	*df*
.9569	. 9139	1580.8	1612.6	−784.4	1568.8	1483

Scaled residuals:

Min	1Q	Median	3Q	Max
−4.1351	−.5287	.1876	.4285	5.7447

Random effects

Groups	Name	Variance	*SD*	χ^2	*p*	
source	(Intercept)	2.99	1.729	149.24	<.0001	***
Number of observations:		1489				
groups:		782				

Fixed effects

	Estimate	*SE*	*Z*	*p*	
(Intercept)	1.5799	.1907	8.286	<.0001	***
mod_type=deont	−1.3337	.6656	−2.004	.0451	*
mod_type=dyn	−.9119	.1753	−5.201	<.0001	***
syll_coll=two	−3.8684	.3448	−11.221	<.0001	***
VNC_period=1830–1859	−1.2393	.2501	−4.954	<.0001	***

As shown in Table 7, in the case of [*won't* v], we can also observe that monosyllabic slot fillers in the VNC period 1900–2009 increase the chances for the contraction (estimated log odds for the intercept: 1.5799); only this time, it is the contraction rather than the full form that favors epistemic contexts, while deontic and dynamic contexts significantly increase the chances for *will not* v. The model thus confirms an earlier assumption based on the DCA results from Table 3 that the increasing number of verbs conveying 'permission' or 'refusal' for which the full form has become more distinctive may be indicative of its relative preference to express '(un-)willingness'.

Finally, consider the GLMM results for [SUBJ*'d* V] and SUBJ *would* V in Table 8. Epistemic contexts, bi- and terasyllabic collexemes, inanimate and second as well as third person subjects increase the odds for the full form, which means, conversely, the contraction prefers dynamic contexts, monosyllabic collexemes and animate, first person subject hosts (estimated log odds for the intercept: 2.5871). Interestingly, there is no discernable effect of TIME, that is, neither the sense distribution nor any subject preferences have significantly changed over the two VNC periods. Again, this is somewhat in line with results from the DCAs (see Table 4), where it was specifically SUBJ *would* V that remained almost static regarding its most distinctive collexemes across time.

Table 8. Results from the GLMM for [SUBJ*'d* V]

Call

glmer	(cxn ~ mod_type + syll_coll + SUBJ_pers + SUBJ_animacy + (1 | source), family = binomial, data = SUBJ_d, glmerControl(optimizer = "bobyqa"))

Model statistics

C-Index	Somers' D_{xy}	AIC	BIC	logLik	deviance	*df*
.9411	.8822	1334.4	1382.4	−658.2	1316.4	1521

Scaled residuals:

Min	1Q	Median	3Q	Max
−6.3229	−.5115	−.0778	.3831	5.623

Random effects

Groups	Name	Variance	*SD*	χ^2	*p*	
source	(Intercept)	1.169	1.081	19.66	<.0001	***
Number of observations:		1530				
groups:		1044				

Fixed effects

	Estimate	*SE*	*Z*	*p*	
(Intercept)	2.5871	.2398	10.787	<.0001	***
mod_type=epist	−1.3973	.1961	−7.124	<.0001	***
syll_coll=four	−.5592	1.5490	−.361	.7181	ns
syll_coll=three	1.9785	.9236	2.142	.0322	*
syll_coll=two	−2.7063	.4903	−5.520	<.0001	***
SUBJ_pers=2nd	−.7290	.2529	−2.883	.0039	**
SUBJ_pers=3rd	−2.2856	.2544	−8.985	<.0001	***
SUBJ_animacy=inanimate	−3.4914	.4924	−7.091	<.0001	***

Essentially, all three GLMMs thus show, among other things, significant differences between contractions and full forms in terms of their modal functions. The model fits are very good, considering that the *C*-index of concordance is larger than .9 for each case, which indicates outstanding discrimination (Hosmer & Lemeshow, 2000, p. 162). Yet, it should be kept in mind that these results explain the choice of these contractions over their full forms in combination with their respective most distinctive collexemes, that is, they generalize across these specific combinations and highlight the differences. Admittedly, this provides a somewhat narrow view, as the results say nothing definitive about the constructional typicality of the contractions (or their full forms), namely whether, for example, [*won't* V] is epistemic in nature overall. Based on the present results, any claims regarding the functional (or other) preferences of these modal contractions can only be made relative to their respective competing forms. Nonetheless, the differences and changes observed here are still real and this approach models at least part of the knowledge speakers have of these cxns.

4. From contractions to constructions

Given the constructionist and diachronic treatment of the modal contractions presented here, the next logical step is to relate the previous findings from Section 3 to the discussion on constructional change which, according to Hilpert,

> selectively seizes a conventionalized form-meaning pair of a language, altering it in terms of its form, its function, any aspect of its frequency, its distribution in the linguistic community, or any combination of these. (Hilpert, 2013a, p. 16)

As already established in Section 3.1, all contractions are structurally idiosyncratic, that is, in terms of their morphology, they do not conform to any predictable pattern. However, according to the *OED*, the earliest written attestations of these contractions date back to the 17th century and thus lie clearly outside the scope of COHA. The coalescence, although it has certainly happened at some point, can therefore not be addressed empirically with the data at hand and must simply be taken as a given.

Functionally, each contraction favors a specific modal context relative to its full form; for example, [*won't* V] favors epistemic contexts in PDE, while its full forms can be associated rather with contexts signaling dynamic volition. Moreover, for both negative contractions, it was shown that their functional preferences have changed over time (relative to their full forms), which would clearly qualify as constructional change. In the case of [SUBJ'*d* V], such an effect was absent from the data. Here, the contraction already had and has maintained its distinctive functional preferences.

Arguably, the most notable changes observed here relate to the contractions' usage frequencies. Assuming that frequency is essential to linguistic knowledge (which is widely accepted in usage-based theories of language), then regardless of whether contractions are treated as cxns or not, the significant increases in their relative frequencies could reflect a re-arrangement of the mental representation(s) of these forms and can therefore in either case be considered instances of constructional change (cf. Hilpert, 2013a, p. 207). Similarly, the changes in the collocational behavior of the expressions investigated here indicate constructional changes related to frequency, whereby the mutual attraction between a contraction (or its full form) and its distinctive collexemes is altered over time. All three contractions exhibit clear differences in their collostructional behavior between the first and last VNC periods with a general tendency to increasingly attract cognitive and emotive verbs.

Furthermore, Hilpert proposes that constructional change may also manifest in a cxn's distributional changes in the linguistic community (Hilpert, 2013a, p. 17). Up to now, the present study has only focused on fictional texts, but a closer look at the other genres for which COHA provides material indicates that the contractions have become relatively more prominent in all of them, as illustrated in Figure 6. The trends in the respective developments in relative frequency are summarized in Table 9.

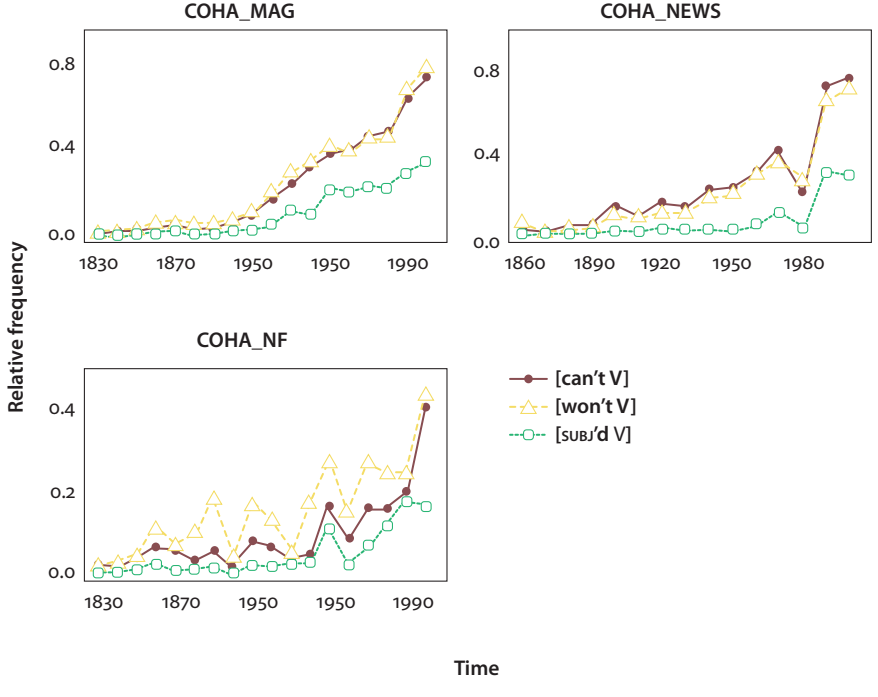

Figure 6. Changes in the usage frequency of [*can't* V], [*won't* V] and [SUBJ*'d* V] relative to their full forms in different written genres; COHA

Table 9. Trends in the relative development of [*can't* V], [*won't* V] and [SUBJ*'d* V] in different written genres; COHA

	[*can't* V]		[*won't* V]		[SUBJ*'d* V]	
	r_τ	$p_{\text{two-tailed}}$	r_τ	$p_{\text{two-tailed}}$	r_τ	$p_{\text{two-tailed}}$
MAG	.97	<.0001	.93	<.0001	.87	<.0001
NEWS	.87	<.0001	.87	<.0001	.85	<.0001
NF	.61	.0002	.65	<.0001	.74	<.0001

In all genres, the contractions exhibit strong, significant increases in their use relative to the full forms, thus providing further evidence of constructional changes. Over the course of the 19th and 20th century, the trends are most notable in magazines and newspapers (cf. Millar 2009, p. 211–212). Such developments have generally been associated with colloquialization (cf. e.g. Leech, 2003, p. 236; Leech et al., 2009, pp. 239–249) and/or loosening of editorial style conventions (e.g. Millar, 2009, p. 212).

Most importantly, Hilpert notes that constructional changes have to be distinguished from systemic changes, that is, changes that affect language on a global level, such as the Great Vowel Shift or the massive loss of English inflections since Old English as a result of language contact (Hilpert, 2013a, pp. 13–14, 205). The changes recorded in the present study are clearly not of that magnitude and, despite some similarities in the development of their distinctive collostructional behavior and their overall increase in relative usage frequency, each contraction has (developed) its own functional preferences, thus supporting a constructional treatment of the changes at hand.

Thus far, it has been proposed that the developments reported in this study constitute a series of constructional changes. The remaining questions are whether the data also support the idea that the contractions investigated here may in fact be regarded as cxns distinct from their respective full forms and whether it is possible to pinpoint the moment of constructionalization (Traugott & Trousdale, 2013, p. 1).

To answer the first question, all aspects mentioned up to this point need to be taken into consideration. From a PDE perspective, [*can't* V], [*won't* V] and [SUBJ*'d* V] all exhibit idiosyncratic formal properties, specific collocational and functional behavior that differs from their source forms and they are found across all written and spoken genres. Additionally, the contractions' emancipation appears to be in full progress as evidenced by their significant increases in (relative) usage frequency. In combination, these results lend weight to this paper's central claim that the contractions investigated here may be regarded as cxns. Moreover, these contractions also pave the way for other lexically more specified chunks (so-called prefabs) that take on new (possibly discourse-like) functions (cf. Bybee & Scheibman, 1999); for example, *I can't help (but)* VP, *Can't say I* VP, *That won't do* or *I'd say*.

The second question cannot be answered straightforwardly (if at all) on the basis of the data at hand. (Gradual) constructionalization is defined as the emergence of a new node in the construct-i-con, that is, when a new form combines with a new meaning, and it is typically preceded and followed by a succession of constructional changes (pre-constructionalization and post-constructionalization respectively) feeding into one another (Traugott & Trousdale, 2013, pp. 22–29). Although the definition is lucid, applying it to the present data raises a few issues. To illustrate, the first textual appearance of the contractions (at least according to the *OED*) predates their first COHA entry by at least 150 years, which means that the morphological change was already completed by that time. However, given the unavailability of corresponding corpus data, this time gap represents a kind of black box, meaning that it remains uncertain (for now) whether there were any meaning changes during that period. As a consequence, it is not possible to determine conclusively whether the data from COHA represent either the pre- or post-constructionalization stage of the contractions. This is complicated further by the fact that it is not clear at what point the label 'new meaning' is well deserved. In either case, it is proposed here that the contractions will have received their own lexical entry as soon as they survived their initial on-off use, that is, once the contractions stabilized, a network as depicted in Figures 1 and 2 may potentially be assumed. While these contractions may have initially been perceived as pure pronunciation variants with the same meanings as their source forms, it seems as if their unpredictable formal properties facilitated an increasing dissociation from them (hence the opaque subpart links in the network models), which essentially led to the functional divergences discussed in Sections 3.4 and 3.5.

Furthermore, Traugott & Trousdale exclude frequency as a factor from their analyses (Traugott & Trousdale, 2013, p. 11), which means that the bulk of the results from the present study can simply not be integrated into that discussion. However, recent studies on emerging modals, most notably Lorenz (2013a, 2013b, 2013c), have assigned a key role to usage frequency in the emancipation process of a contracted form. In his model, emancipation involves, among other things, a formal change (beyond online phonetic reduction and univerbation) and functional divergence (Lorenz, 2013c, pp. 36, 46). This is quite similar to Traugott & Trousdale's (2013) notion of constructionalization. By contrast, the driving forces behind emancipation are absolute and relative frequency; an increase in the absolute frequency of a contracted form initiates the process of emancipation and an increase in its relative frequency marks its progress (Lorenz, 2013a, pp. 33–37, 232–235). With this in mind, the constructionalization of the contractions investigated here is perhaps more likely to have happened within the time frame of COHA, more specifically in the 19th century. Until the 1910s, each contraction has more than tripled its relative frequency of use (cf. Figure 3), while the following decades

are marked by stagnation. The functional divergence is also evident in all three cases, with the negative contractions having changed their relative preferences from the beginning of the 19th to the 20th century. The enclitic differs in this regard; the functional distinctiveness already existed prior to its increase in relative usage frequency. However, Lorenz notes that the different stages of the emancipating process need not happen one after the other but may in fact overlap (Lorenz, 2013a, p. 235). Whether or not the constructionalization of the modal contractions did in fact take place in the 19th century (or before that) is still speculative, but perhaps it would be even more so if frequency was not taken into consideration.

5. Concluding remarks

In this study, I hope to have shown that, from a constructionist perspective, it might be worth entertaining the idea that (some) modal contractions, namely [*can't* V], [*won't* V] and [SUBJ*'d* V], represent distinct cxns rather than semantically identical, colloquial variants of their respective full forms. For each case presented here, a detailed account of their respective formal idiosyncrasies, collocational behavior, distinctive functional preferences and distributional changes has been provided. It was argued that the multi-facetted developments of [*can't* V], [*won't* V] and [SUBJ*'d* V] constitute a series of constructional changes. Moreover, when all aspects are considered in combination, they amount to the contractions' constructionalization; although, it remains not fully clear when this actually took place (at least the corpus data at hand cannot give too much indication of that, even if frequency is taken into consideration).

The constructionhood of the modal contractions was addressed empirically by means of different quantitative methods (e.g. VNC, DCA, GLMM). These helped identify structure and subtleties in the data that arguably could not have been detected using a more conservative, intuition-based approach. They also provided different perspectives on the data and facilitated an investigation of the different types of constructional change.

Apart from having focused on three case studies only, a potential shortcoming of this paper is perhaps that there is no experimental validation of the results. If speakers do in fact store and process these contractions holistically as cxns, this hypothesis should stand up to testing under laboratory-controlled environments. Although corpus-based studies do not in general necessitate the employment of complementing experiments, it seems that any study that either implicitly or explicitly investigates linguistic knowledge as represented in the minds of speakers should consider actually investigating the minds of speakers.

Finally, I would like to point out possible implications the findings of the present study have on future studies on the English modal system. If a linguist accepts the degree of granularity which results from treating (at least some) contracted variants as cxns in their own right, methodologically, it follows that aggregated frequency counts of, for example, *will, 'll, will not* and *won't* under one umbrella cxn WILL becomes problematic, as this would fail to adequately describe the underlying heterogeneity of this set of expressions. This also entails that we may eventually be confronted with what Wärnsby (2002, p. 7) has skeptically referred to as "a bewildering web of [modal] constructions", but perhaps this comes with the territory; as Trousdale (2016, p. 54) points out "the modals are a particularly messy category".

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Corpora, software, packages and scripts

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Exploring relative degrees of auxiliarization empirically in German modal constructions with *wissen* and *verstehen*

Does host class expansion provide enough evidence?

Volodymyr Dekalo

The present paper investigates which sort of information – item- or feature-based – is more sufficient to quantify relative degrees of auxiliarization. To understand this issue, the study utilizes two German near-synonymous semi-schematic modal constructions with *wissen* and *verstehen*. Sketching the notion of host class expansion, the paper shows that the evidence of host class expansion by gauging type frequency of co-occurring elements is often used to demonstrate the increasing grammaticalization of a construction within usage-based construction grammar. Applying a mixed-effects binary logistic regression, the study ascertains a difference in the relative degree of grammaticalization between the *wissen*- and *verstehen*-construction by means of such usage features as (a) the position of verbal complements, (b) the grammatical form of modal auxiliaries, and (c) the animacy of subject referents. Comparing these results with the counts of the co-occurring element types of each modal construction, the analysis reveals that they contradict each other. As a result, the usage feature-based behavior is considered to be more important for deciding the relative degree of grammaticalization of semi-schematic constructions than host class expansion.

Keywords: grammaticalization, auxiliarization, modal construction, host class expansion, mixed-effects binary logistic regression

1. Introduction

Usage-based construction grammar (Bybee & Beckner 2010; Goldberg 2006) provides beneficial conditions for studying grammaticalization phenomena. A growing interest in how lexical constructions come to express a grammatical function or less grammatical constructions increase their grammatical functionality has led

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to the formation of diachronic construction grammar (see, e.g., Bergs & Diewald 2008; Hilpert 2013a; Noël 2007; Traugott & Trousdale 2013). In addition, a quantitative turn within usage-based linguistics has resulted in some attempts to measure (increasing) grammaticalization of constructions empirically. These attempts have focused on the distributional behavior of constructions, in particular utilizing the notion of host class expansion (Himmelmann 2004). However, reliable measures of ongoing grammaticalization are still largely missing from empirical research (for some proposals, see Petré & van de Velde 2018; Correia Saavedra 2019). It will be argued in this paper that host-class expansion does not always provide sufficient evidence for grammaticalization.

In line with this claim, the present study will focus on quantifying relative degrees of grammaticalization of near-synonymous grammatical constructions. A case study of two semi-schematic constructions with the modal auxiliaries *verstehen* 'understand' and *wissen* 'know' in modern German will explore to what extent the two forms are auxiliarized. This will be examined through a statistical analysis that takes usage features as grammaticality criteria. The degree to which these constructions are grammaticalized will be operationalized in terms of three variables: (a) the position of verbal complements, (b) the grammatical form of modal auxiliaries, and (c) the animacy of subject referents. Additionally, the present investigation will compare two quantitative approaches towards gauging relative degrees of auxiliarization. The two modal constructions with *verstehen* and *wissen* will be analyzed in two different ways with regard to their schematic open slot. The first, item-based approach will measure host class expansion. The second, feature-based approach will incorporate usage attributes. Both approaches will be tested in a probabilistic model.

This paper is structured as follows. First, Section 2 will sketch the notion of host class expansion and how it is gauged quantitatively in usage-based construction grammar studies. In view of this, it will be argued that the host class expansion information is not sufficient to measure increasing grammaticalization. Section 3 presents the case study outlining the empirical basis, response and fixed-effect variables, the methodology, and random-effect variables. In Section 4, the results of the corpus study will be presented and their theoretical and methodological implications will be discussed. Section 5 wraps up the paper with a short conclusion.

2. Problem statement: Host class expansion in grammaticalization studies

This section delineates the notion of host class expansion used as a parameter of gauging constructional change in grammaticalization within the framework of usage-based construction grammar. In addition, it will be argued that the evidence of host class expansion is not always enough to demonstrate the increasing grammaticalization of a construction.

Himmelmann (2004, p. 32) defines grammaticalization as "a process of context expansion". Accordingly, he proposes three different kinds of context expansion: host class expansion, syntactic context expansion, and semantic-pragmatic context expansion. Host class expansion is viewed as a distributional extension within "the class of elements the gram is in construction with". In usage-based construction grammar, host class expansion is typically applied as an indication of increasing grammaticalization, particularly as pertaining to syntactic (semi-schematic) constructions. This means that these constructions contain an open slot that is mapped by a syntactic category and that can be filled by various lexical items. In view of this, novel lexemes occurring in such a construction extend the schematic slot semantically: They reduce their collocational or rather collostructional constraints gradually and increase the degree of grammatical functionality of that construction at the same time. Syntactic context expansion is connected with an extension of syntactic environments of a construction. Semantic-pragmatic context expansion is regarded either as an extension of a constructional meaning or as an extension of communication situations, in which a construction may be used.

Host class expansion as a clue that a syntactic construction has increased its degree of grammaticalization is utilized within usage-based construction grammar divergently (Coussé 2014; Dekalo 2019; Guardamagna 2018; Neels 2015; Patten 2010). Coussé (2014) explores shifts in collocational preferences of two perfect constructions with the auxiliaries *hebben* and *sijn* in the history of Dutch, as illustrated in (1) and (2). The empirical basis of this study is represented by legal texts dating from the middle of the 13th century until the end of the 18th century.

(1) *Marie* ***heeft*** *een appel* ***gegeten***.
'Mary has eaten an apple.'

(2) *Jan* ***is*** *naar huis* ***gegaan***. (Coussé 2014, p. 160)
'John has gone home.'

She demonstrates through quantitative corpus study utilizing distinctive collexeme analysis that both perfects have undergone collocational expansion over time. In the 13th and 14th centuries, the *hebben*-construction attracts primarily change-of-possession verbs (verbs of giving and getting, verbs of future having). In the 15th century, verbs of communication, possession and perception appear to be distinctive collexemes of the *hebben*-construction. In the 16th century, the *hebben*-perfect occurs with transitive activity verbs and intransitive telic *komen* 'come' in irrealis contexts. The *sijn*-perfect undergoes distributional changes in a way other than the *hebben*-perfect. In the 13th and 14th centuries, predominantly change-of-location and change-of-state verbs are strongly associated with the *sijn*-construction. In the 15th century, verbs of occurrence and verbs of continuation of pre-existing condition appear to be distinctive collexemes. In the 16th

century, the atelic existence-of-state verb *zijn* 'be' belongs to the distinctive collocational profile of the *sijn*-perfect. As a consequence, Coussé (2014) considers the host class expansion only as an extension through novel verbs representing a completely new semantic class. The novel verbal lexemes belonging to the semantic groups used in a construction before, for instance, verbs of giving and getting in the *hebben*-construction, are not discussed as a host class expansion.[1]

A similar interpretation of host class expansion is given by Neels (2015), who explores the evolution of *use(d) to* into a habitual aspect marker during the history of English, utilizing data from three corpora of Historical English (Parsed Corpus of Early English Correspondence, Corpus of English Dialogues, Corpus of Late Modern English Texts). This construction is exemplified in (3).

(3) *So what did you* ***used to*** *do of an evening down at home?* (Neels 2015, p. 178)

He utilizes the term of host class expansion for describing collocational extension both for the slot of non-finite lexical verbs and for the position of subject referents. Being originally combined only with dynamic verbs denoting activities and restricted to animate subjects, *use(d) to* was expanded to stative verbs and subjects designating inanimate things (Neels 2015, pp. 199–202). Similar to Coussé (2014), Neels (2015) does not consider the internal extension within a semantic category of collocates (e.g. within the group of dynamic verbs over time) as host class expansion. This can be due to the fact that Neels (2015, pp. 200–201) does not discuss specific exemplars of dynamic and stative verbs, showing merely the summarized results for these semantic classes.

Hilpert (2013b) offers an entirely different interpretation of host class expansion relating to the case study of the development of the English *it*-cleft construction in the Penn Parsed Corpora of Historical English (Patten 2010).[2] The English *it*-cleft contains a focal element followed by a relative clause representing presupposed information, as in (4–7).

(4) *It was* ***the therapist*** *that killed her.* (Patten 2010, p. 222)

(5) *It's* ***in December*** *that she's coming.* (Patten 2010, p. 222)

(6) *It was just* ***here*** *that we met.* (Patten 2010, p. 222)

1. Coussé (2014) does not qualify the lexical extension of the slot for past participle lexical verbs as host class expansion explicitly. Notwithstanding, Coussé (2018, pp. 93–118) considers the lexical extension in Coussé (2014) as host class expansion.

2. It is important to note that Patten (2010, pp. 221–243) does not label such an increase of syntactic category variability for focal components as host class expansion directly, but as "increasing schematicity".

(7) *It's* ***that he's so annoying*** *that bothers me.* (Patten 2010, p. 232)

Noun phrases appear as focal elements in the *it*-cleft throughout the history of English language and are used most frequently. Prepositional phrases come to occur as focal elements from the 14th century onwards. Adverbial and clausal elements as a focal component commence to be used since the Early Modern English period. In comparison to Coussé (2014) and Neels (2015), Hilpert (2013b) considers the host class expansion as an increase in variation of syntactic realization of focal complements formalized by divergent phrasal categories. Accordingly, the open slot for focal constituents of the *it*-cleft is defined semantically or rather functionally.

Notwithstanding, there is another approach for measuring host class expansion, namely one proposed by Guardamagna (2018). She explores the evolution of the Latin *secundum*+NP 'according to NP' construction, as illustrated in (8), utilizing the data from the Latin Library corpus. Guardamagna (2018, pp. 187–191) considers the increase in type frequency of NP-lexemes as well as the growth of the number of sematic groups of NP-lexeme types as quantitative parameters for host class expansion.

(8) *Conlaudav-i secundum… virtut-es* (Guardamagna 2018, p. 173)
'I praised [you] in accordance with your virtues…'

In comparison with the diachronic studies mentioned, Dekalo (2019) applies the concept of host class expansion to measure the relative degree of grammaticalization of near-synonymous modal constructions (with the semi-modals *wissen* and *verstehen*) expressing dynamic modality 'to be able to do sth.' in the DWDS Core Corpus of the 20th century (DWDS-Kernkorpus des 20. Jahrhunderts; Geyken 2007). These constructions represent a combination of a modal auxiliary (AUX) *wissen* or *verstehen* with a schematic slot for non-finite verbal complements (V_{INF}), exemplified in (9) and (10) respectively.

(9) *Diesen Umstand* ***wußte*** *der Agent auch sehr*
This circumstance-M.ACC know-PRET.3SG the agent-M.NOM also very
geschickt ***auszunutzen****.* (Dekalo 2019, p. 74)
cleverly to exploit-INF
'The agent was able to exploit this circumstance very cleverly.'

(10) *Menschliche Schwäche unterstellte er und*
Human weakness-F.ACC assume-PRET.3SG he-NOM and
verstand *er* ***auszunutzen****.* (Dekalo 2019, p. 57)
understand-PRET.3SG he-NOM to exploit-INF
'He assumed human weakness and was able to exploit it.'

The results of this exemplar-based corpus analysis reveal that the *wissen*-construction contains 878 types of V_{INF}-lexemes, whereas the *verstehen*-construction includes slightly more types of lexical verbs, namely 937. In addition, all instantiations with the 50 highly attracted verbal complements defined by simple collexeme analysis are grouped into semantic categories to identify semantic category variability of V_{INF}-slot fillers. For this purpose, Dekalo (2019, pp. 45–46) applies an external inventory of verbal semantic classes (GermaNet; Hamp & Feldweg 1997) to ensure the consistency of semantic categorization. This qualitative inspection suggests that the central verbal collexemes of the modal *wissen*-construction conceptualize nine semantic categories: social situation, communication, cognition, emotion, contact, change, competition, stative situation, and possession. In contrast, the *verstehen*-construction attracts verbal collexemes expressing the following twelve semantic domains: social situation, creation, location, communication, contact, cognition, change, possession, emotion, competition, body, and stative situation. As a result, the *verstehen*-construction possesses the higher degree of host class expansion entailing more types of V_{INF}-lexemes as well as more semantic categories than the *wissen*-construction. In line with this, Dekalo (2019) similarly to Guardamagna (2018) views a growing number of both lexical verb types and semantic categories conceptualized by the verbal collexemes as host class expansion. This approach to quantifying the host class expansion will be used in the present case study.

As we have seen, the concept of host class expansion is used in different ways. The most common interpretation of host class expansion refers to the occurrence of novel elements in a schematic slot of a construction conceptualizing a completely new, not previously existing, semantic domain or both a new as well as already existing conceptual categories. Furthermore, host class expansion is considered currently to be the most appropriate empirical cue for increasing grammaticalization of a semi-schematic construction by comparing collocational profiles of different historic stages (Coussé 2014; Guardamagna 2018; Neels 2015; Patten 2010). Similarly, the host class expansion can also be applied to gauge the grammaticality of near-synonymous syntactic constructions within one historic period, viz. synchronically (Dekalo 2019).

Despite all this, I aim to show in this study that host class expansion alone is not sufficient or rather not in all cases sufficient to conclude that a construction has become more grammatical. Conversely, such (syntactic and semantic) usage features as the position of verbal complements, the grammatical form of modal auxiliaries and the animacy of subject referents (which will be demonstrated later) play a greater role in reflecting an increasing degree of grammaticalization. This means that if a collocational profile or the semantic diversity of collocates of a construction increases, it is not necessarily the case that its degree

of grammaticalization increases as well. This statement is motivated by the fact that although the *verstehen*-construction has a greater number of V_{INF}-types than the *wissen*-construction (937 vs. 878), its token frequency is considerably lower than that of the *wissen*-construction, namely 2645 vs. 4804 (Dekalo 2019, p. 58). This evidence makes the concept of host class expansion not reliable enough, because an auxiliary verb construction becoming more grammatical ordinarily should occur in language usage more frequently, viz. showing gradually increasing token frequency (see, e.g., Hopper & Traugott 2003, pp. 126–130).

A further reason for not considering host class expansion as a parameter for increasing grammaticalization concerns the fact that a schematic slot of a lexical or an idiomatic construction can also be extended by novel items, increasing in such a way merely its productivity, but not the grammaticalization degree of the construction. For instance, Barðdal (2008) investigating argument structure constructions considers the extension of these constructions to new types or verbs just as syntactic productivity. She connects the high type frequency of constructions with the higher level of schematicity, not referring to the fact that they should possess the higher degree of grammaticalization. This is why I argue that the productivity of an open slot of an auxiliary verb construction, i.e. its type frequency, does not always correlate with the rising grammatical functionality of the construction, whereas the productivity of the whole auxiliarizing construction, i.e. its token frequency, should be positively correlated with the increase of its grammaticality degree.

3. Case study

In view of the fact that, in the construction grammar literature, the concept of host class expansion is commonly used as the main parameter of increasing degree of grammaticalization without taking into account functionality of syntactic features, the present study aims at providing an in-depth account of measuring the relative degree of auxiliarization (as a special case of grammaticalization), quantitatively considering primarily peculiarities of syntactic usage features. This will be compared with host class expansion through lexemes, viz. item-specific information, measured by type frequency.

First, I will describe two modal constructions with the auxiliary verbs *wissen* and *verstehen* in present-day German. Second, the corpus used will be presented. Third, I will sketch the response and the explanatory variables (viz. fixed-effect terms), quantifying the relative degree of auxiliarization. Fourth, the generalized linear mixed model and random-effect variables used in this study will be described. Last, I will map out the results obtained from the statistical modelling.

3.1 Constructions of dynamic modality with *wissen* and *verstehen*

In German, the verbs *wissen* and *verstehen*, which take non-finite lexical verbs as complements, constitute semi-schematic modal constructions. They instantiate the category of dynamic modality, allowing speakers to express the meaning of 'being able to do sth.', as illustrated above in (9) and (10). Accordingly, they operate within the modal constructions as grammatical markers that have been auxiliarized from their lexical equivalents. The verb *wissen* in its lexical interpretation means 'to know', as exemplified in (11), whereas the lexical verb *verstehen* means 'to understand', as in (12).

(11) *Wir* ***wissen,*** *was daraus geworden ist.*
We know-PRS.1PL what out of this become-PST.PTCP sein-AUX.PRF
'We know what has happened therewith.' (DWDS CC20)

(12) *Ich* ***verstehe,*** *wie Sie ihn lieben.* (DWDS CC20)
I understand-PRS.1SG how you him-ACC love-PRS.3PL
'I understand how you love him.'

Both lexical sources represent cognitive verbs denoting intellectual ability. They follow the development of the canonical German modal verb *können* into a grammatical marker of dynamic modality, as in (13). The modal verb *können* was auxiliarized from its lexical counterpart – a cognitive verb expressing mental ability as well – with a meaning 'to know' (Diewald 1999, pp. 344–350).

(13) *Allein ich* ***kann*** *es tragen!* (DWDS CC20)
But I can-PRS.1SG it-ACC bear-INF
'But I can bear it!'

Consequently, cognitive verbs, particularly with intellectual ability, are viewed as appropriate lexical sources in German from which grammatical form-meaning patterns of dynamic modality emerge. This corresponds clearly to the well attested grammaticalization (source-target) path "TO KNOW > ABILITY" (Heine & Kuteva 2004, p. 186).

This contribution aims at ascertaining empirically which of the two German near-synonymous modal constructions (with *wissen* or *verstehen*) is more auxiliarized. Accordingly, this study does not include the construction of dynamic modality with *können* as the most strongly auxiliarized marker. There are three main reasons for that. First, the *können*-construction exhibits a slightly different syntactic structure. In comparison with the *wissen*- and the *verstehen*-construction, it attracts verbal lexemes without the particle *zu*. Because of this, some of the explanatory variables discussed later could not be operationalized for the *können*-construction in a suitable manner. Second, the *können*-construction differs substantially in

terms of its grammaticality from the other two constructions. Lastly, involving the *können*-construction would render the statistical modelling more complex and less precise with regard to the contrast between *wissen* and *verstehen*.

3.2 Data

Because of the fact that the modal constructions with *wissen* and *verstehen* are typically used in written language, this study utilizes the DWDS Core Corpus for the 20th century (*DWDS-Kernkorpus des 20. Jahrhunderts*; Geyken 2007). It contains about 100 million words of written German and balancing texts from literary, scientific, journalistic and non-fiction writing. The data preparation for the present study proceeded as follows. First, all examples with the verbs *wissen* and *verstehen* occurring with non-finite verbal complements with the particle *zu* within a sentence have been extracted automatically by querying the DWDS Core Corpus. The retrieval of occurrences of *wissen* and *verstehen* with V_{INF}-lexemes has taken into account that non-finite lexical verbs in both modal constructions can appear after as well as before the verbs *wissen* and *verstehen* due to the peculiarities of German sentence structure. Next, all instances have been checked manually, because not all combinations of the verbs *wissen* and *verstehen* with V_{INF}-lexemes within a sentence truly constitute a modal construction. Accordingly, in complex sentences, non-finite verbal complements have operated frequently as parts of other constructions, whereas *wissen* and *verstehen* have occurred as lexical verbs. Such instantiations have been excluded from the data set. The final data set contains 4768 observations with the modal *wissen*-construction and 2607 observations with the modal *verstehen*-construction.[3]

3.3 Response and fixed-effect variables

Because of the fact that the present study focuses on two modal constructions, the response variable is a nominal variable labeled as `MODAL.CX` consisting of two levels: `wissen.cx` vs. `verstehen.cx`. In line with this, the logistic regression, i.e. a type of regression analysis with categorical dependent variable, will be applied in order to gauge differences in the relative degrees of grammaticalization of two

3. The number of observations for two modal constructions in the present analysis differs from the previous study of Dekalo (2019) regardless of utilizing the same empirical basis, viz. the DWDS Core Corpus for the 20th century. This disagreement is due to extraction of observations at varying times. Dekalo (2019) exported observations in 2015 using the older version (version 2) of the DWDS Core Corpus for the 20th century. In contrast, the present paper utilizes version 3.

modal constructions by means of three predictors, i.e. fixed-effect variables. In this investigation, the following fixed-effect indicators will be discussed: (a) the position of the non-finite verbal complements with their arguments within a modal construction, (b) the grammatical form of the verbs *wissen* and *verstehen*, and (c) the animacy of subject referents.

In previous studies on auxiliarization of semi-modals in German, it was argued that the position of non-finite verbal complements with their arguments, viz. infinitive phrases, with respect to a modal operator plays an important role (Askedal 1999). Accordingly, it allows us to determine whether such an operator exhibits lexical or grammatical, or it would be better to say less grammatical or more grammatical status. This means that modal markers with post-located infinitive phrases, as exemplified in (14), (15) and (16), entail more lexical than grammatical information, whereas modal markers with pre-located infinitive phrases, as in (17) and (18), possess a higher degree of grammatical functionality.

(14) *[…] der Mensch hätte nicht* ***gewußt,***
the person-M.NOM have-AUX.PLUPRF not know-PST.PTCP
sich in äquivalenter Münze zu äußern: […] (DWDS CC20)
oneself-ACC in equivalent coin-F.DAT to express-INF
'This person was not able to express himself in an equivalent way.'

(15) *Er hat nie* ***verstanden****, sein*
He-NOM have-AUX.PRF never understand-PST.PTCP his-POSS
Geld zu machen. (DWDS CC20)
money-SG.ACC to make-INF
'He was never able to make money.'

(16) *Kühnen* ***verstand*** *es glänzend, Menschen zu*
Kühnen understand-PRET.3SG it-ACC brilliantly people-PL.ACC to
begeistern. (DWDS CC20)
inspire-INF
'Kühnen was able to inspire people.'

(17) *Denn in der Tat haben die späteren Jahrhunderte*
Because in the act-F.DAT have-AUX.PRF the later century-PL.NOM
nur weniges hinzuzufügen ***gewußt****.* (DWDS CC20)
only few to add-INF know-PST.PTCP
'In fact, the later centuries have only been able to add a few things.'

(18) *Wir haben nicht einmal die eigene Tradition zu*
We-NOM have-AUX.PRF not once the own tradition-F.ACC to
wahren ***verstanden****, […]* (DWDS CC20)
preserve-INF understand-PST.PTCP
'We have not even been able to preserve our own tradition.'

In German, the post-located infinitive phrases can be connected to preceding operators with a referential pronoun *es*, as in (16), which is regarded to be a placeholder for those infinitive phrases. The presence of the pronoun *es* makes the infinitive phrase *Menschen zu begeistern* move in a position located outside the predicative part. Alternatively, the preceding operators can occur without the pronoun *es* as well, as illustrated in (14) and (15). Accordingly, the infinitive phrases *sich in aequivalenter Münze zu äußern* in (14) and *sein Geld zu machen* in (15) are located outside of the verbal frame (*Verbalklammer*) constituted by the temporal auxiliary verb *hätte* / *hat* and the modal marker *gewusst* / *verstanden*.

On the one hand, the behavior of modal auxiliaries *wissen* and *verstehen* in (14), (15) and (16) resembles greatly constructions with lexical verbs (e.g. *beabsichtigen* 'to intend', *bedauern* 'to regret' etc.) appearing with post-located infinitive phrases, as in (19) and (20).

(19) *Er hatte* ***beabsichtigt,*** *sein Incognito zu wahren, […].* (DWDS CC20)
He-NOM have-AUX.PLUPRF intend-PST.PTCP his incognito-N.ACC to preserve-INF
'He had intended to remain anonymous.'

(20) *Ich* ***bedaure*** *es sehr, Sie in Wien nicht gesehen zu haben, […].* (DWDS CC20)
I-NOM regret-PRS.1SG it-ACC very you-ACC in Vienna not see-PST.PTCP to have-AUX.INF
'I regret not having seen you in Vienna.'

On the other hand, the usage of modal auxiliaries *wissen* and *verstehen* in (17) and (18) is very similar to constructions with canonical modal verbs occurring only with pre-located infinitive phrases, as in (21) and (22).

(21) *Böttcher hat nie wieder einen Spielfilm drehen* ***können*** (DWDS CC20)
Böttcher have-AUX.PRF never again a-ACC film-M.ACC spin-INF can-AUX.MOD[4]
'Böttcher was never able to make a movie again.'

(22) *Sie müssen ihn nur bedienen* ***können.***
They-NOM must-AUX.MOD him-ACC only serve-INF can-AUX.MOD
'They only have to be able to serve him.' (DWDS CC20)

4. AUX.MOD stands for "modal auxiliary verb".

This demonstrates that instantiations of the modal constructions with post-located infinitive phrases are similar to lexical constructions. As a result, they are regarded as less grammatical in the present study. In comparison to this, occurrences with pre-located infinitive phrases are considered as more grammatical, because they behave analogically to constructions with canonical modal verbs in German. In line with this, the peculiarities of the position of the non-finite verbal complements with their arguments within a modal construction is operationalized in this study by a nominal variable `POSITION` with two levels: `post.located` vs. `pre.located`. Consequently, if a modal construction (with *wissen* or *verstehen*) attracts pre-located infinitive phrases more frequently in contrast to the other one, then it will be regarded as auxiliarized to a greater degree.

The next predictor integrated as a parameter for gauging a degree of grammaticalization is a grammatical form of the verbs *wissen* and *verstehen*. It is labeled in this analysis as `GRAM.FORM` containing two levels: `synthetic` vs. `analytic`. The analytical grammatical form means that the modal auxiliaries *wissen* and *verstehen* occur with other auxiliaries (of modality or tense) constituting multi-word verbal assemblies, as exemplified in (23)–(27). They contain two kinds of auxiliary verbs: a first-order auxiliary (tense markers or modal verbs) and a second-order auxiliary (*wissen* or *verstehen*).

(23) ***Hat*** *er denn noch etwas zu erwidern*
Have-AUX.PRF he-NOM MOD.PCL[5] else anything to reply-INF
gewußt? (DWDS CC20)
know-PST.PTCP
'Has he been able to say anything else at all?'

(24) *Er* ***hatte*** *doch* ***verstanden,*** *sein*
He-NOM have-AUX.PLUPRF MOD.PCL understand-PST.PTCP his
Winternest zu finden. (DWDS CC20)
winter nest-N.ACC to find-INF
'He had been able to find his winter nest after all.'

(25) *Eine […] junge Dame* ***wird*** *sich auch in solchen*
A young lady-F.NOM AUX.MOD oneself-ACC also in such
Fällen zu benehmen ***wissen.*** (DWDS CC20)
case-PL.DAT to behave-INF know-INF
'A young lady will also be able to behave herself in such circumstances.'

5. MOD.PCL stands for "modal particle".

(26) *Du* ***sollst*** *nicht wie sie zwischen Gut und Böse gar*
You-NOM should-AUX.MOD not like she between good and evil really
nicht zu unterscheiden ***wissen***, […] (DWDS CC20)
not to distinguish-INF know-INF
'In comparison to her, you should not be able to distinguish between good and evil.'

(27) *[…], man* ***muß*** *sie teilweise und kritisch*
they-NOM must-AUX.MOD she-ACC selectively and critically
anzuwenden ***verstehen***. (DWDS CC20)
to apply-INF understand-INF
'You have to be able to apply it selectively and critically.'

This demonstrates that the auxiliaries *wissen* and *verstehen* instantiated in perfect, pluperfect and future tense or with modal verbs *müssen* ('must') and *sollen* ('need') are treated to be realized in an analytical grammatical form. It should be pointed out that the (analytical) grammatical form is regarded here as a structural feature, not semantical. I do not distinguish between the occurrence of the verbs *wissen* and *verstehen* with tense markers and modal verbs, although they differ in their semantic properties. The main criterion for the analytical form is that the verbs *wissen* and *verstehen* are combined with any other auxiliary verbs.

It is also noteworthy that the co-occurrence with other canonical modal verbs, such as *wollen* ('to want'), *mögen* ('to like / may'), *können* ('can'), *dürfen* ('may / can'), has not been found in the corpus data. This can be explained as follows. The meaning expressed by the modal constructions with *wissen* and *verstehen* is very similar to the meaning of the *können*-construction. As a result, their cooccurrence within a sentence is not to be expected. The combination of meanings expressed by the modal verbs *wollen, mögen, dürfen*, namely 'volition' and 'permission', with the meaning of the constructions with *wissen* and *verstehen*, i.e. 'ability', leads to semantic incompatibility and is hence not very common in language use.

Alternatively, the instantiations of the modal constructions with *wissen* and *verstehen* realized in present tense and imperfect are considered in the present analysis to possess a synthetic grammatical form, as illustrated in (28) and (29).

(28) *Wer* ***versteht*** *zu trinken?* (DWDS CC20)
Who-NOM understand-PRS.3SG to drink-INF
'Who can hold their drink?'

(29) *So* ***wusste*** *sie Martha stets zu trösten, […].*
Thus know-PRET.3SG she-NOM Martha-ACC always to comfort-INF
'Thus, she always could comfort Martha.' (DWDS CC20)

In this study, the realization in an analytical form is regarded as a cue for a lower degree of grammaticality. In contrast, the auxiliaries *wissen* and *verstehen* instantiated in a synthetic form are considered as an indicator for stronger grammaticality. Despite the fact that both less and more auxiliarized markers can appear in syntactic as well as analytic grammatical forms, I argue that the more auxiliarized operators have to occur more frequently in synthetic than analytical forms. This is because the behavior of *wissen* and *verstehen* in analytical forms is greatly similar to that of lexical verbs because they function as second-order auxiliaries. Nevertheless, the auxiliaries *wissen* and *verstehen* in synthetic forms occur without additional grammatical markers, because they are grammatical markers. This predictor is motivated by Hopper's (1991, pp. 30–31) principle of *de-categorization*, which presupposes that a grammaticalizing verb tends to shed syntactic features of the full category, i.e. of lexical verbs, and to absorb usage characteristics that are typical of auxiliary verbs. This means that within analytical assemblies, the verbs *wissen* and *verstehen* should be used more frequently as first-order auxiliaries, viz. just like modal or tense verbs, than as second-order elements.

The last variable applied to measuring grammaticality degree concerns the referent information of the subject. It is marked in the present study as `ANIMACY` subdivided into two levels: `animate` vs. `inanimate`. Animate subject referents contain both human (individuals as well as collectives) and non-human beings, as exemplified in (30)–(32). In contrast, inanimate subject referents comprise objects and abstract concepts, as in (33).

(30) ***Der Dichter*** *weiß Kluges und Tiefes*
The poet-M.NOM know-PRS.3SG (something) clever and (something) deep
zu sagen. (DWDS CC20)
to say-INF
'The poet is able to say clever and deep things.'

(31) ***Ein ganzes Volk*** *verstand die Schlagzeilen der*
An entire nation-N.NOM understand-PRET.3SG the headline-PL.ACC the
Zeitungen zu lesen, […]. (DWDS CC20)
newspaper-PL.GEN to read-INF
'An entire nation was able to read the newspaper headlines.'

(32) *Den Mangel seiner Stimme weiß* ***der alte Storch***
The lack-M.ACC his voice-F.GEN know-PRS.3SG the old stork-M.NOM
aber in anderer Weise zu ersetzen. (DWDS CC20)
but in another way-F.DAT to replace-INF
'But the old stork is able to replace his fading voice in another way.'

(33) *Auf jeden Fall wird sich* ***die Zukunft*** *die neuen*
On each case-M.DAT AUX.MOD oneself-DAT the future-F.NOM the new
Erkenntnisse zu sichern wissen. (DWDS CC20)
finding-PL.ACC to ensure-INF know-INF
'At any rate, the future will be able to make use of the new knowledge.'

This predictor is closely related to metaphorization viewed as a cognitive mechanism in grammaticalization processes (Heine et al. 1991, pp. 45–64; Traugott & König 1991, pp. 207–212). More specifically, the change in animacy information, i.e. from animate to inanimate referents, is based on the metaphorical extension "PERSON-TO-OBJECT" (Heine et al. 1991, p. 52). In the case of auxiliarization, this becomes apparent when auxiliarizing verbs restricted only to animate subject referents come to appear with inanimate subject referents showing a higher degree of grammaticalization (Diewald 1997, p. 47). Accordingly, the subject referent information operationalized in this analysis as ANIMACY also allows us to ascertain which of the modal auxiliaries is more grammaticalized. This means that more frequent usage of the modal constructions with inanimate subject referents stands for greater grammaticality.

3.4 Mixed-effects model and random-effect variables

In corpus-based research, it happens that a text or an author of texts can be the source of more than one observation in a data set. Consequently, applying a standard binary logistic regression model can lead to misleading results, because the assumption of independence of observations is violated. Put differently, this triggers errors of statistical inference. Accordingly, observations extracted from a corpus are clustered within texts. As a rule, they are not distributed equally across texts, viz. the contribution of texts may vary. This means that strongly contributing texts affect greatly the resulting model. For instance, the present study contains 7375 observations grouped under 1651 texts (see Figure 1). 735 texts, i.e. 45% of all texts, provide only one observation, that accounts nearly for 10% of all data points. In contrast, 151 texts are the source of more than ten observations, that amounts to 50% (n = 3697) of all instances. On average, each text comprises nearly 4 observations (mean = 4.47, SD = 8.06, median = 2, IQR = 3). The number of observations per text ranges between 1 and 81. There are two main reasons for such an unequal distribution. First, the corpus texts have different sizes. Second, the constructions investigated are used to varying extents by the authors that are represented in the corpus.

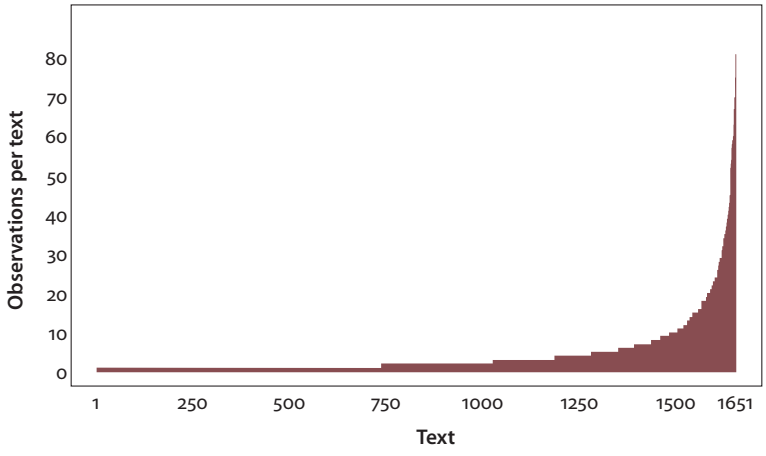

Figure 1. Number of observations per text

In order to minimize possible bias that could be caused by highly contributing texts in the resulting statistical model, a mixed-effects binary logistic regression model will be fitted including both fixed-effect and random-effect terms (Baayen 2008; Gelman & Hill 2009). Mixed-effects models are currently a common procedure within usage-based cognitive linguistics (see, e.g., Baayen & Tagliamonte 2012, Tummers et al. 2015). Fixed-effect terms stay constant across texts having identical measurements. In this study, the predictors POSITION, GRAM.FORM, and ANIMACY, which were discussed in the previous section, will be applied as fixed-effect variables. They possess the same levels across texts in the data set. In contrast, random-effect terms, such as for example texts, vary because they are drawn randomly from a larger language variety. In this analysis, TEXT and REGISTER will be applied as random-effect variables that allow us to control for variation among registers and among texts within registers.

The variable `TEXT` concerns texts standing approximately for authors which have produced the modal constructions with *wissen* and *verstehen*. Authors as a random-effect term might yield sharper results. Because of the fact that not all observations retrieved from the DWDS Core Corpus 20 contain author information, especially observations of journalistic texts, texts replace authors in this investigation. Due to the structure of the DWDS Core Corpus 20, all texts are clustered under the four registers mentioned above. In line with this, the random-effect term `REGISTER` is used accounting for by-register variation as well as for variation of nested random effect, viz. among texts within registers.

In line with the research question of this study, both statistical hypotheses for the present statistical model in simplified form can be formulated as follows:

H_0: No relationship exists between the response variable (MODAL.CX) and at least one of the predictors (POSITION, GRAM.FORM, ANIMACY) or their interactions.

H_1: There is a significant correlation between the response variable (MODAL.CX) and at least one of the predictors (POSITION, GRAM.FORM, ANIMACY) or their interactions.

Accordingly, if the null hypothesis is true, then both modal constructions (with modal auxiliaries *wissen* and *verstehen*) possess the same degree of grammaticalization in written German. In contrast, if the alternative hypothesis is true, the fitted model will reveal which of the modal constructions is more strongly auxiliarized and which predictors are responsible for this.

4. Results and discussion

I fitted a mixed-effects binary logistic regression model, i.e. with a binary response variable, using the R-package *lme4* (Bates et al. 2015). The full (beyond optimal) model consisting of fixed effects (animacy, position, grammatical form and all possible interactions between them) and two random effects (only intercepts for registers and texts nested into registers) is shown in (34).

(34)
```
MODAL.CX  ~  ANIMACY + POSITION + GRAM.FORM +
             ANIMACY:POSITION +
             GRAM.FORM:POSITION +
             ANIMACY:GRAM.FORM +
             ANIMACY:POSITION:GRAM.FORM +
             (1|REGISTER) + (1|TEXT:REGISTER)
```

The random effects selection procedure revealed that the random intercept for registers (i.e. REGISTER) possesses extremely small variation so that it could be discarded. This means that the multilevel structure, i.e. the clustering of texts into registers, is no longer relevant for the model. Due to this, the final model contains solely one random term, namely a random intercept for texts. The selection of the fixed effects structure showed that there was no significant interaction effect between: (a) position, animacy and grammatical form; (b) position and animacy; (c) animacy and grammatical form. Accordingly, these interaction terms could be taken out of the model. As a result, I constructed a final model that is based on the formula presented in (35).

(35) `MODAL.CX ~ ANIMACY + POSITION + GRAM.FORM + GRAM.FORM:POSITION + (1|TEXT)`

The mixed-effects binary logistic regression finds significant effects for animacy, position, grammatical form and a significant interaction between position and grammatical form summarized in Table 1. This table consists of six columns. The first column represents fixed terms of the final model. The second column (COEF) contains estimated coefficients of the final model that predicts the probability of `MODAL.CX` using the fixed effects presented in (35). The third column (SE) includes standard errors of the regression estimates which show how accurate the regression estimates are. Small standard errors, which is the case here, stand for the high accuracy of the regression coefficients. The fourth column (Z) consists of z-values which are equal to COEF / SE. Accordingly, a large (absolute) score of the z-statistic provides evidence against the null hypothesis. The fifth column (PR) represents p-values (for the corresponding fixed term) measured on the basis of the z-statistic. The last column (SIGN) contains levels of significance for the fixed effects and offers a visual evidence against the null hypothesis.

Table 1. Fixed effects in the optimal model

FIXED EFFECT	COEF	SE	Z	PR	SIGN
(Intercept)	−4.730	0.424	−11.154	0.0000	***
GRAM.FORM_synthetic	1.596	0.448	3.562	0.0004	***
POSITION_pre.located	6.367	0.439	14.495	0.0000	***
ANIMACY_inanimate	0.417	0.155	2.684	0.0073	**
GRAM.FORM_synthetic: POSITION_pre.located	−1.713	0.460	−3.722	0.0000	***

The random effect represented by the variable `TEXT` is characterized by the standard deviation score of 1.031. This means that there is considerable variability across texts, and that the random term `TEXT` should be included to the model. The goodness-of-fit measures for this model are moderate. The marginal R^2-score considering only the variance of the fixed effects is 0.498. The conditional R^2-value taking both the fixed and random effects into account is 0.621. The intra-class-correlation coefficient of 0.244 for the random intercept (for texts) displays the amount of the overall variation in the response explained merely by the grouping effect. Analogically to the standard deviation score of the random term, this score allows us to determine whether a mixed model is necessary and whether a random variable should be retained in the model. The intra-class-correlation coefficient greater than 0 indicates that the observations within groups are no more similar than observations from different groups. Accordingly, the intra-class-correlation coefficient of 0.244 provides evidence for holding the random term `TEXT` in the present model.

The prediction accuracy of 0.831 for the final model (i.e. the proportion of correctly predicted cases of response to the total number of predicted cases of response made by the model) means that the model performs fairly well. According to a one-tailed binomial test, this is highly significant greater than the baseline level of 0.647 ($p_{one\text{-}tailed} < 0.001$), which would be the probability of making a correct prediction if the more frequent response were always selected, i.e. the modal *wissen*-construction.[6]

Table 1 shows that all fixed terms are statistically significant. This demonstrates that they represent functional conditions in which the two modal constructions differ considerably. Because of the fact that this model contains three nominal explanatory variables with their levels standing for more or less grammatical functionality, I constructed eight usage contexts, viz. usage feature bundles generated by all possible combinations of levels of these variables (see Table 2). As noted in Section 3.3, the levels `post.located`, `analytic` and `animate` entail a weaker grammaticalization degree, whereas the levels `pre.located`, `synthetic` and `inanimate` represent a stronger degree of grammaticalization. By means of the fixed effect estimates from the statistical model in Table 1 that were plugged into the regression equation,[7] it was possible to determine probabilities for each modal construction for all contexts created. The usage contexts in Table 2 are organized in such a way that the probability values increase (for the *wissen*-construction) or decrease (for the *verstehen*-construction) gradually. This helps to inspect the relevance of predictors by changing from less grammatical to more grammatical features. Additionally, more grammatical features are highlighted in bold to offer a visual evidence for changing from less grammatical to more grammatical characteristics.

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6. A one-tailed binomial test was conducted by using the following R-function: binom.test(x = 6130, n = 7375, p = 4768 / 7375, alternative = "greater"). 6130 is the number of correctly predicted response cases. 7375 means the overall frequency of the observations used in the model. 4768 / 7375 is the proportion of the more frequent response to the total number of the observations. "greater" means that a directional hypothesis was formulated (H_1): The probability of success (i.e. the proportion of 6130 / 7375) is greater than the probability of 0.647 (i.e. the proportion of 4768 / 7375).

7. The simplified regression equation, i.e. without information about variation across texts, is as follows: logit(MODAL.CX) = b0 + b1 × ANIMACY + b2 × POSITION + b3 × GRAM.FORM + b4 (GRAM.FORM × POSITION) + e. b0, b1, b2, b3 and b4 are regression coefficients (see Table 1).

Table 2. Probability for modal constructions for relevant contexts (usage feature bundles)

USAGE FEATURE BUNDLES			PROBABILITY	
POSITION	GRAM.FORM	ANIMACY	*VERSTEHEN*-CX	*WISSEN*-CX
post-located	analytic	animate	0.9913	0.0087
post-located	analytic	**inanimate**	0.9868	0.0132
post-located	**synthetic**	animate	0.9583	0.0417
post-located	**synthetic**	**inanimate**	0.9381	0.0619
pre-located	**synthetic**	animate	0.1795	0.8205
pre-located	analytic	animate	0.1629	0.8371
pre-located	**synthetic**	**inanimate**	0.1260	0.8740
pre-located	analytic	**inanimate**	0.1137	0.8863

Table 2 reveals that the modal *wissen*-construction in opposition to the *verstehen*-construction occurs with considerably higher probability in contexts indicating a greater degree of grammaticalization. In addition, the features used do not affect the response to the same extent. The variable `POSITION` exhibits the strongest impact on predicting a difference in auxiliarization degree between two constructions. Accordingly, the change from `post.located` to `pre.located` increases the likelihood of the *wissen*-construction drastically. To be more precise, the predicted probability for the *wissen*-construction for the contexts with post-located infinitive phrases ranges between 0.0087 and 0.0619. This means that the *wissen*-construction is not typical in these contexts. Switching to the contexts with pre-located infinitive phrases, the predicted probability for the *wissen*-construction rises extremely. The probability scores vary between 0.8205 and 0.8863, demonstrating the high preference of the *wissen*-construction. The examples in (36–43) represent respectively all usage feature bundles from Table 2. The sentences (36–39) illustrate the contexts with post-located infinitive phrases. The examples (40–43) demonstrate the usage feature bundles with pre-located infinitive phrases. Because of the fact that the *verstehen*-construction occurs in the contexts with post-located infinitives with high predicted probability, all these examples contain intentionally only the modal auxiliary *verstehen*. The same strategy was implemented for the last four contexts, where the *wissen*-construction is preferred.

(36) *Sie muß verstehen, auch Reste schmackhaft*
She-NOM must-AUX.MOD understand-INF also waste-PL.ACC tasty
zu machen, denn […] (DWDS CC20)
to make-INF because
'She must be able to serve even leftovers in a tasty way, as …'

(37) *Die Theologie hat es durch Jahrhunderte*
The theology have-AUX.PRF it through centuries
verstanden, alle guten Wirkungen unserer
understand-PST.PTCP all-ACC good-ACC effects-ACC our-PL.GEN
Hochschulen zu vernichten; (DWDS CC20)
universities-PL.GEN to destroy-INF
'Theology has been able for centuries to destroy any positive effect that our universities might have had;'

(38) *Er verstand auch, den Unterricht für seine*
He-NOM understand-PRET.3SG also the-ACC lesson-ACC for his-ACC
Schüler fesselnd zu gestalten (DWDS CC20)
pupils-ACC captivating to organize-INF
'He also was capable of making teaching a captivating experience for his students.'

(39) *Der kaiserliche Palast hat die Nomaden angelockt,*
The imperial palace have-AUX.PRF the-ACC nomads-ACC attract-PST.PTCP
versteht es aber nicht, sie wieder zu vertreiben.
unserstand-PRS.3SG it but not them-ACC again to drive-INF out
'The imperial palace has attracted the nomads but is incapable of getting rid of them again.' (DWDS CC20)

(40) *Sie wußte aber durchaus nichts zu antworten.*
She-NOM know-PRET.3SG but definitely nothing to answer-INF
'She was utterly not able to answer.' (DWDS CC20)

(41) *Der Förster hatte zu berichten gewußt, der*
The forester have-AUX.PLUPRF to report-INF know-PST.PTCP the-NOM
Wald wäre leer. (DWDS CC20)
forest-NOM be-AUX.SBJV empty
'The forest ranger was able to report the forest to be empty.'

(42) *Die Gläser wissen einander schonend zum*
The-PL.NOM glasses know-PRS.3PL each other carefully to the-DAT
Klingen zu bringen. (DWDS CC20)
tintinnabulation to bring-INF
'The glasses can produce a gentle ringing sound among each other.'

(43) *Die zünftige Kritik hatte mit dem Bild nicht*
The professional critique have-AUX.PLUPRF with the-DAT picture not
viel anzufangen gewußt (DWDS CC20)
much to begin-INF know-PST.PTCP
'The professional critique was not able to do anything with the picture.'

The effect direction of the variable GRAM.FORM in usage contexts differs from that of the predictor POSITION greatly. Within the contexts with post-located infinitive phrases, the change from analytic to synthetic increases the probability of the *wissen*-construction reflecting the same impact tendency found for the variable POSITION. In contrast, within the feature bundles with pre-located infinitive phrases, the switch from analytic to synthetic *reduces* the likelihood of the *wissen*-construction. This explains why the interaction term GRAM.FORM:POSITION possesses a significant impact and was retained in the final model: The predictor GRAM.FORM behaves differently depending on the levels of the variable POSITION. The confidence intervals of the analytic and synthetic form within post-located infinitive phrases do not overlap (see Figure 2 on the left). This proves that the two modal constructions are used significantly differently with respect to the grammatical form (analytic vs. synthetic) within post-located infinitive phrases. In contrast to this, Figure 2 (on the right) shows that the confidence intervals of the analytic and synthetic form within pre-located infinitive phrases overlap. This means that within pre-located infinitives there is no significant difference between analytic and synthetic grammatical forms.[8] As a result, the features analytic and synthetic within pre-located infinitives do not play a role for determining an auxiliarization degree and for interpreting the predictions for both constructions.

Similar to the predictive tendency of the term POSITION, the switch from animate subject referents to inanimate boosts the chance of the *wissen*-construction. Holding the other features constant and changing from animate to inanimate, i.e. from less grammatical to more grammatical functionality, we can see the small increase in the probability in favour of the *wissen*-construction. For instance, in the context with the features post.located and analytic, the probability for the *wissen*-construction grows from 0.0087 (animate) to 0.0132 (inanimate) (see Table 2). In the contexts with the features post.located and synthetic, the likelihood for the *wissen*-construction rises from 0.0417 (animate) to 0.0619 (inanimate). Finally, in the contexts with pre-located verbal complements, the chance of the *wissen*-construction increases as well: from 0.8205/0.8371 (animate) to 0.8740/0.8863 (inanimate). As has been shown, the grammatical form is not specified in the last feature bundle. This is because there is no statistically significant difference between analytic and synthetic within the contexts with pre-located infinitives.

8. Because of the fact that the confidence intervals may overlap and there may be a statistically significant difference at the same time, an additional inspection was conducted, which showed that there is indeed no statistically significant difference between the features analytic and synthetic within pre-located infinitives.

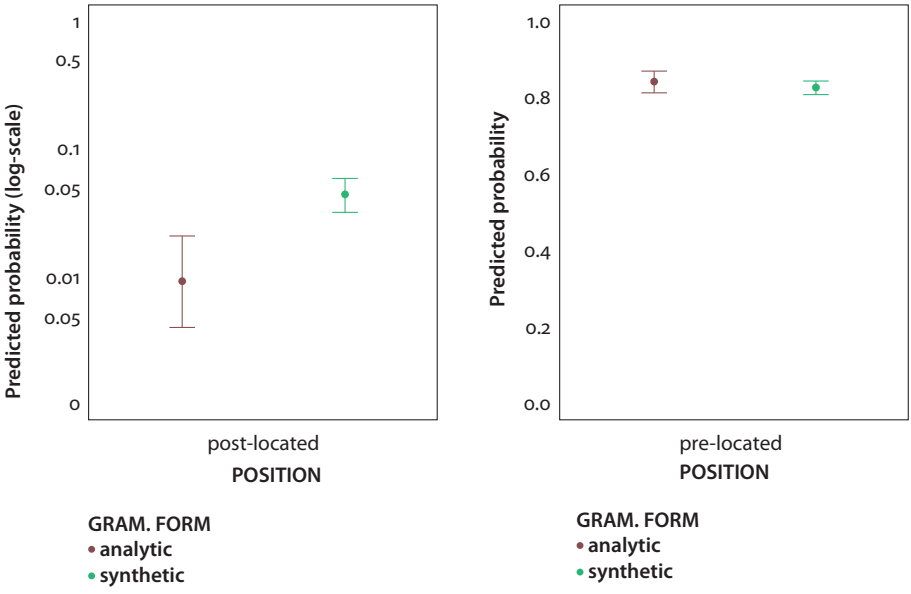

Figure 2. Predicted probability for the *wissen*-construction for the interaction GRAM.FORM:POSITION

A crucial point to be mentioned here is that high token frequency correlates strongly with the fact that the modal *wissen*-construction is auxiliarized substantially more strongly than the modal *verstehen*-construction. The *wissen*-construction occurs almost two times more frequently than the *verstehen*-construction in the DWDS Core Corpus for the 20th century. This empirical evidence confirms the common statement within grammaticalization studies that the occurrence of a construction in language usage increases with rising grammatical functionality (see, e.g., Hopper & Traugott 2003, pp. 126–130). This means that an auxiliarizing construction should exhibit its growing prevalence among language users in order to be on the way for further grammaticalization.

Despite this, the host class expansion of both constructions measured in the present study by means of V_{INF}-lexeme type frequency contradicts both the results obtained from statistical modelling and the token frequency. The *verstehen*-construction includes 927 types of verbal lexemes in the V_{INF}-slot, whereas the *wissen*-construction contains only 865 types of V_{INF}-lexemes. According to the concept of host class expansion presented in Section 2, the modal *verstehen*-construction should possess more grammatical meaning than the *wissen*-construction because of its higher V_{INF}-slot variability. Nevertheless, this is not the case here. In my view, host class expansion, i.e. the growth of item types appearing in a schematic slot, can proceed not only in grammatical constructions, but in lexical constructions as

well without indicating an increase of grammatical functionality. For instance, the meaning of dynamic modality 'to be able to do sth.' in German can be expressed by lexical semi-schematic constructions as well, namely by form-meaning patterns *fähig sein / in der Lage sein / imstande sein* occurring with infinitive verbal complements, as exemplified in (44).

(44) *Christa* ***war*** *kaum* ***imstande****, sich auszukleiden; […].*
Christa be-PRET.3SG hardly capable oneself-ACC to undress-INF
'Christa was barely able to undress herself.' (DWDS CC20)

The modal construction with *imstande sein* can be used with diverse V_{INF}-lexeme types. This is why I consider host class expansion quantified by type frequency as not satisfactory to infer the grammaticality status of a semi-schematic construction, because the extension of co-occurring elements could be a clue for only increasing variability or productivity of a schematic slot without any connection to rising degree of grammaticalization. In addition, the feature-based usage information of a construction should be regarded as primarily relevant for measuring a degree of grammaticalization. I am not saying that that it is not important to examine item-based usage peculiarities in grammaticalization studies. On the contrary, the item-based information can contribute greatly to the feature-based usage behavior, but should not be considered as the main determining factor.

In view of this, the concept of host class expansion should not be utilized as an indication of increasing auxiliarization as a special case of grammaticalization. Because of the fact that the present study is the first investigation comparing item- and feature-based characteristics of semi-schematic constructions with respect to their grammaticality level, the role of host class expansion should be studied further, particularly regarding other (not only verbal) domains of grammaticalization research. This can help to ascertain in which cases it can be a sufficient criterion for detecting increasing grammaticalization, and in which it is not.

5. Conclusion

The central claim of this study is that the host class expansion used in grammaticalization research within the framework of usage-based construction grammar is not sufficient to deduce that a semi-schematic construction undergoes grammaticalization. In contrast, usage features provide solid evidence for higher or lower degrees of grammaticality. It is argued that the expansion of a schematic slot through novel fillers can only be regarded as a clue for growing lexeme variability within a schematic slot of a construction, not obligatorily for increasing grammaticalization. This suggests that host class expansion is merely a by-product phenomenon in grammaticalization.

The present empirical study inspected a difference in the relative degree of grammaticalization between the *wissen*- and *verstehen*-construction by applying a usage feature-based analysis, namely a mixed-effects binary logistic regression. The position of the non-finite verbal complements with their arguments within a modal construction, the grammatical form of verbs *wissen* and *verstehen*, and the animacy of subject referents were utilized as features for gauging the relative level of grammaticalization of two constructions under investigation. According to the results of the statistical model, the modal *wissen*-construction is auxiliarized to a greater extent than the modal *verstehen*-construction. In addition, this corresponds with token frequency of the two modal constructions, which shows that the *wissen*-construction appears more frequently (i.e. nearly two times as often) in written German than the *verstehen*-construction. However, both the probabilistic model and the token counts contradict the results of quantifying the V_{INF} slot, i.e. the host class, expansion via type frequency. The modal *wissen*-construction occurs with a smaller number of verbal lexeme types than the modal *verstehen*-construction. As a consequence, I consider the usage feature-based behavior more important for identifying the relative degree of grammaticalization of semi-schematic constructions than host class expansion. Having said that, further research is certainly needed to ascertain which role host class expansion plays in grammaticalization studies.

Abbreviations

COEF	regression coefficient	PR	p-value
SE	standard error	SIGN	level of significance
Z	z-statistic		

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Grammaticalization of *verdienen* into an auxiliary marker of deontic modality

An item-driven usage-based approach

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This paper investigates synchronic variation in the lexical and grammatical environments of the German lexical verb *verdienen* 'earn', 'deserve'. In its lexical uses, *verdienen* co-occurs with an object noun phrase whose head is either concrete (e.g. *Geld* 'money') or, more commonly, abstract (e.g. *Beachtung* 'attention'). When it is used more grammatically with deontic modal meaning, *verdienen* is followed by a passive or active infinitive. This paper uses collostructional analyses to contrast lexical and grammatical uses in terms of the most strongly attracted lexical items, which are grouped into semantic classes. The results reflect different degrees of host-class expansion (cf. Himmelmann 2004), whereby the collexemes of *verdienen* expand from concrete to abstract and their morpho-syntactic contexts from nominal to infinitival complement and subsequently from passive to active. Synchronic distribution can thus serve as a window on diachronic development (Kuteva 2001), in this case the rise of a deontic modality marker.

1. Introduction

The emergence of modal constructions has been a major topic (not only) in grammaticalization studies during several decades now, whereby the focus of attention has been on three areas. To begin with, most research has concentrated on the rise of epistemic meanings from constructions with modal verbs and infinitive verbal lexemes denoting non-epistemic (i.e. deontic, volitional, dispositional) modal meanings. Second, many surveys have focused on constructions with semi-modal verbs and infinitive verbal complements (e.g. Krug, 2000; Narrog, 2012; Traugott, 1989; Dekalo, 2019), and thirdly, there exists a number of studies on the rise of evidential constructions, particularly focusing on partially grammaticalized constructions with verbs meaning 'threaten', 'promise', 'seem', etc. (Diewald & Smirnova,

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2010; Cornillie, 2004; Heine & Miyashita, 2008; Diewald & Stathi, 2019). The rise of non-epistemic modal functions, e.g. deontic or volitional modality, from more lexical items and constructions with more concrete meaning, like regular main verbs with their complementation patterns, has attracted much less attention.

Thus, in German, the verb *verdienen* ('deserve', 'earn') has not been regarded, let alone investigated as a modality marker so far. In the present study, we claim that *verdienen* is on the rise as an auxiliary verb of deontic modality. In order to demonstrate this, we focus on the present day usage of the verb *verdienen*. According to the assumption in grammaticalization research that synchronic variation is a window for diachronic development (cf. Kuteva, 2001, p. 9; see also Bybee, Perkins & Pagliuca, 1994, p. 18), we aim to reconstruct the diachronic development, i.e. the grammaticalization path, of the verb *verdienen* utilizing data of modern German. This well established method of deriving assumptions on diachronic processes by looking at synchronic data rests on some basic tenets of grammaticalization theory, namely that (i) the process of grammaticalization is in principle unidirectional, which means that (ii) it leads from less grammatical to more grammatical functions in a particular item or construction; (iii) it is possible to identify different degrees or stages of grammaticalization in morpho-syntactic, semantic and functional terms (e.g. via testing instruments like the grammaticalization parameters introduced by Lehmann 2015 [1982]); (iv) in the synchronic layer of a language containing several constructions of an item of different "ages", the more grammaticalized ones – with very high probability – will be the diachronically younger ones, and the degrees of grammaticalization of co-existing constructions can be assumed to reflect the relative chronology of their diachronic development.

This synchronic reconstruction method is not only indispensable for research into languages with no diachronic evidence, but it is useful for languages with a long history of documentation like German as well, because for the modern stage of the language there are more data with much better accessibility than is the case for centuries past. Therefore, the synchronic investigation of rich data (of the 20th century) concerning a particular item (here *verdienen*), selected and organized along the relevant features and parameters that are the results of many in-depth studies on the grammaticalization history of the category in question (here modality in verbal periphrasis, i.e. auxiliarization of modal verbs in German), is able to provide a solidly informed reconstruction (or hypothesis) of the grammaticalization path of that particular item (cf. Sections 2 and 3 for details). This is what the present study aims at.

The following examples illustrate the four constructions of *verdienen* in German, which we are most interested in as they represent important grammaticalization stages of the verb *verdienen*.

(1) *Er* ***verdiente*** ***Geld*** *durch Unterricht* […].
He-NOM earn-PRET.3SG money-N.ACC through lessons-ADV.INST
'He earned money through giving lessons.' (DWDS CC20)[1]

(2) *Aber ihr mögt darüber sagen, was ihr*
But you-NOM may-AUX.MOD about it say-INF whatever you-NOM
wollt, er ***verdient*** *doch* ***Respekt****.*
want-PRS.2PL he-NOM deserve-PRS.3SG still respect-M.ACC
'You may say whatever you want, he still deserves respect.' (DWDS CC20)[2]

(3) *Gerade dieses Detail, bedenkt Arlecq schreibend,*
Especially this detail-N.NOM consider-PRS.3SG Arlecq-M.NOM write-PROG
verdiente hervorgehoben zu werden*, […].* (DWDS CC20)[3]
deserve-PRET.3SG emphasize-PST.PTCP to be-INF.AUX.PASS
'This very detail, Arlecq considers while writing, should be emphasized/deserves to be emphasized.'

(4) *Ein so Elender* ***verdiene*** *nicht zu* ***leben****.*
One such miserable-M.NOM derserve-PRS.SUBJ.3SG not to live-INF
'Such a miserable one should not live.' (DWDS CC20)[4]

As the examples show, the constructions express different lexical and grammatical meanings, which are ordered here in their assumed increase in degrees of grammaticalization (for their constructional format see Section 3.1). In (1) and (2), the verb *verdienen* functions as a lexical verb expressing the meaning 'to earn' and 'to deserve' respectively. In (3) and (4), *verdienen* appears in combination with infinitive verbal complements, always with the infinitive particle *zu*. Accordingly, (3) represents the construction with an infinitive passive (past participle of main verb with *zu* & *werden*), which is associated with the meaning 'should be V-ed'. (4) exemplifies the construction with an active infinitive which expresses the meaning 'should V'. The verb *verdienen* is regarded here as more grammaticalized and as denoting obligation. This is why the target domain of this grammaticalization process is deontic modality.

In order to reconstruct the grammaticalization path of the verb *verdienen* towards a deontic modal, we conducted an in-depth item-driven synchronic analysis

1. Lebert, Schaeffer, Albrecht: Helianth II, Bonn: Weidle, 1995 [1920], p. 454

2. Enzensberger, Hans Magnus: Der kurze Sommer der Anarchie, Frankfurt a. M.: Suhrkamp, 1972, p. 61

3. Fries, Fritz Rudolf: Der Weg nach Oobliadooh, Frankfurt a. M.: Suhrkamp, 1966, p. 77

4. Klepper, Jochen: Der Vater, Gütersloh: Bertelsmann, 1962 [1937], p. 522

of its four constructions using the data from the DWDS Core Corpus (*DWDS-Kernkorpus*; Geyken, 2007).[5] This means that the present study focuses on the identification of typical lexical items, i.e. collexemes, which occur in the corresponding schematic complement slots of the four constructions with the verb *verdienen*, applying a *simple collexeme analysis* (Stefanowitsch & Gries, 2003). As a further step, we sort the most attracted lexemes into semantic groups using classifications of GermaNet (Hamp & Feldweg, 1997) in order to suggest some generalizations concerning the individual steps in the semantic change of *verdienen*.

The structure of the paper is as follows. Section 2 outlines the theoretical and empirical background of this study, and provides a sketch of deontic modality as the notion is used here. The methods driving the empirical part of our study are described in Section 3. The presentation of the results and their discussion are found in Sections 4 and 5 respectively.

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5. Based on information provided by the online Grimm dictionary (Grimm & Grimm, 1854, see the entry *verdienen*, paragraph 3a and 3b), we may assume that the constructions containing an accusative complement as represented in (1) and (2) are the oldest ones. Exploratory random checks on data taken from the German DTA corpus (Deutsches Textarchiv, 'German text archive') showing occurrences from Early New High German and New High German as well as further examples representing Middle High German, available through the open platform ANNIS, also substantiate this assumption.

We would like to thank one of the reviewers for pointing out that in Dutch 'verdienen' constructions are attested with finite subordinate clause with the subjunction 'that' since the 12th century, and with non-finite complements with stative verbs and passive since the late 16th century (e.g. *Hy heeft wel verdient gestraft te werden* 'he has definitely deserved to be punished' (1573). In short, Dutch shows stages comparable in degrees of grammaticalization to the German constructions exemplified in (3) and (4) earlier than German (at the present state of research). This observation confirms the findings of Lamiroy & De Mulder (2011, p. 302) that "several grammaticalization processes may be more advanced in one language than in the other languages of the same family". For the Germanic languages, they claim that English is further advanced in grammaticalization processes than German, while Dutch occupies an intermediate position with Icelandic being more conservative than German. This is illustrated in the following cline by Lamiroy (2011, p. 167): English > Scandinavian (Continental) > Dutch > German > Icelandic. For empirical evidence showing that English has already completed changes that are still ongoing in German see Lamiroy (2011, pp. 175–176, 185–188); cf. also Diewald & Stathi (2019, p. 180) for additional data and references. In short, even in closely related languages, the absolute chronology of attestation of a specific construction in one language cannot be used as evidence for the progress of a grammaticalization of the analogous construction in the other language. Degrees of grammaticalization for a particular item and its constructions have to be measured within the language in question, and they can be measured independently of diachronic data.

2. Theoretical background

Our theoretical approach is based on the following three components: grammaticalization theory, typological findings and usage-based construction grammar. The last years have seen an upsurge of discussions concerning the connections as well as the dissociations of grammaticalization theory on the one hand and construction grammar on the other (e.g. Coussé, Andersson & Olofsson, 2018; Diewald, 2006; Diewald, 2020; Hilpert, 2018; Noel, 2007). Though this study is not the place to enter deeply into these questions (for a discussion of convergence as well as the incompatibilities of grammaticalization theory and construction grammar see Diewald, 2020), it is necessary to sketch some lines of thought and some theoretical foundations that guide this work. This is done in Section 2.1, while Section 2.2 offers an introduction to the conception of modality, in particular deontic modality, that is the foundation of this study.

2.1 Grammaticalization and constructional concepts

Though grammaticalization is predominantly investigated in terms of diachronic lines of development, it is relevant in the investigation of synchronic variation as well. In this study, we claim that *verdienen* is on the rise as an auxiliary verb of deontic modality. Contending that synchronic distribution is a window for diachronic development (cf. Kuteva, 2001, p. 9), the empirical focus of this study is on the synchronic variation of the verb *verdienen* in modern German in terms of degrees of grammaticalization and on an attempt at deriving possible diachronic paths of development from this synchronic analysis. In the following, some further considerations supporting the basic assumptions described in the introduction (unidirectionality, grammaticalization paths and testing the degrees of grammaticalization) are mentioned in necessary brevity.

First, there are phenomena indicating that observations made with regard to synchronic variation based on contemporary data can be treated as evidence or at least as reasonable assumptions for how diachronic development takes place. Old forms and/or meanings in a broad functional domain (as, for instance, in modality) can persist for a long period of time side by side with new forms and/or meanings, i.e. the rise of new forms and/or meanings does not necessarily lead to the loss of older ones. This kind of synchronic diversity, called *layering* (Hopper, 1991, p. 22), shows how older grammatical techniques remain available, possibly interacting with newer ones. Hopper (ibid.) considers further principles like *divergence*, i.e. the viability of autonomous lexical items after parallel grammaticalization of particular constructions with that item, or *persistence*, i.e. the reflection of lexical history of

an (originally lexical) item within its (newer) grammatical behaviour,[6] all of which draw attention to synchronic observations reflecting diachronic development.

Second, this methodology also rests on some important insights in auxiliation from a cross-linguistic perspective showing that "patterns of multiple uses in effect constitute fossil evidence and can thus serve as a diagnostic of earlier history." (Bybee, Perkins & Pagliuca, 1994, p. 18). By looking into synchronic variation in order to reconstruct diachronic development, more precisely, possible grammaticalization paths, "the fact that grammatical forms do not exist in a functional vacuum, but reflect general strategies by the speakers of languages for putting together discourses", is also taken into account (Hopper & Traugott, 2003, p. 168). Hopper & Traugott (2003, p. 168–170) give examples of ergative case marking, Kuteva (2001, pp. 6–10) provides a detailed overview about theoretical and methodological issues followed by the discussion of cases of contemporary Ewe progressive structures showing locative morphology as a result of spatial constructions (ibid., p. 8–9) and English progressive forms showing overlaps in grammaticalization chains (ibid., p. 10–11).

Beyond these considerations concerning the validity of synchronic data for assumptions about diachronic development in grammaticalization, there are some more general issues that have to be addressed in the following.

It is one of the basic tenets of grammaticalization theory as well as of typological approaches that there exists an essential functional distinction between lexical items/constructions on the one hand, and grammatical items/constructions on the other hand. This difference can be measured by contrasting individual (types of) constructions with the help of analytic procedures such as the grammaticalization parameters introduced in Lehmann (2015 [1982]).

Furthermore, reviewing the wealth of typological findings, there is reason to assume that grammatical functions universally can be classified with the help of a finite, though not strictly limited number of relevant functional domains and basic grammatical distinctions. This assumption is the common denominator of typological research and cross-linguistic and comparative studies (Lehmann, 2015 [1982]; Perkins & Pagliuca, 1994; WALS). Modality and its major distinctions are one of these functional domains (cf. Section 2.2 for the specification of modal concepts used here).

As concerns the diachronic development of grammatical items, theoretical reasoning as well as empirical proof have allowed to establish developmental clines running from lexical items/constructions to grammatical items/constructions for many functional domains of grammar and for many of their more fine-grained

6. For examples see Hopper (1991, p. 22–29) and Hopper & Traugott (2003, p. 124–126).

categories. For the development of auxiliaries from lexical verbs in verbal periphrases in the domains of TAM categories, the possible diachronic scenarios including all decisive factors have been established in the works of many researchers, e.g. Lehmann (2015 [1982]), Bybee, Perkins &Pagliuca (1994), Hopper & Traugott (2003), Diewald (1999, 2020), Diewald & Smirnova (2010). From these and other studies, major changes in auxiliarization processes are known to be the following: morpho-phonological change (e.g. erosion, cliticisation, fusion etc.), syntactic change (reanalysis from lexical head to structural head, i.e. auxiliary, loss of the faculty of argument binding / valency etc.), semantic change (semantic abstraction via metaphorical and other cognitive processes in specific contexts), and functional change, i.e. change of the item's semiotic status from descriptive (characterizing, referential) to grammatical (= expressing paradigmatically organized, indexical functions). All of these changes co-occur in grammaticalization processes, and their successive compilation adds up to unidirectionally ordered stages of development. For modal auxiliaries or the perfect auxiliaries in Germanic languages, to cite well established examples, this means the following: i. the original lexical verb via abstraction loosens its selectional restrictions, e.g. starts taking inanimate, abstract subjects, and it is found with direct objects that do no longer represent concrete entities but propositional entities, i.e. nominalized verbs. As soon as the object position allows infinitive complements the first step towards syntactic auxiliarization is taken. As soon as the subject position is no longer restricted by the erstwhile lexical verb but receives its argument role (valency) from the non-finite complement, reanalysis from a lexical verb to an auxiliary in a verbal periphrasis has taken place. In further stages, the picture diversifies in dependence of the category in question, and the co-existing and competing linguistic elements. For the modal verbs of German this process is examined in its diachronic succession in Diewald (1999), for the evidentials *scheinen* ('shine', 'seem'), *drohen* ('threaten'), *versprechen* ('promise') and *werden* ('become') in Diewald & Smirnova (2010), and for German *scheinen* and English *seem* in Diewald & Stathi (2019) (cf. Section 3 for details necessary in the investigation of *verdienen*).

In short, it is possible to identify typical grammaticalization paths or channels delineating the developmental process from particular source items/constructions towards particular target items/constructions. This also holds for the functional domain of modality. As this domain is among the ones most discussed and investigated, we have ample general evidence of typical grammaticalization channels and stages of development (i.e. specific constructions in their relative chronological order) for individual modal meanings/functions. On these findings, together with the assumption that in synchronic co-existence the more grammaticalized constructions are diachronically later developments, we can base our specific hypotheses

concerning the rise of deontic modality meaning from the verb *verdienen* 'earn' (cf. 2.2 and Section 3 for details and literature).

A further important issue deserves mentioning. Both grammaticalization studies and constructional approaches have investigated items in their linguistic contexts, i.e. both have worked with constructions and their formal, semantic, and functional interrelations, which create manifold gradient transitions and in-betweens of virtually every aspect of linguistic structure (cf. Diewald, 2006).[7] However, the problem of when to speak of a new construction in contrast to mere semantic or formal modification (i.e. polysemy, phonotactic variation, etc.) of an already existing one has remained unsolved. In grammaticalization theory this problem is less pressing, as the diagnosis of a new grammatical construction ultimately rests on functional criteria, i.e. integration into a grammatical paradigm, together with concomitant formal and semantic criteria. Constructional approaches, on the other hand, do struggle with the question of when to talk of an old (modified) construction (= constructional change) and when to talk of a new construction, i.e. a new sign having entered the inventory of language as a semiotic system (= constructionalization). One of the latest attempts solving this is ventured by Hilpert (2018, pp. 26–31). As the author himself states in his summary, there is not yet a final solution:

> To summarize the main point of this section, I consider it an open question whether the distinction of constructionalization and constructional change should perhaps be complemented by another way of differentiating between types of change in the constructional network, and I suggested that dividing up types of change along the parts of the network they affect might be a useful alternative. Notably the differentiation between node changes and connectivity changes seems to hold some promise. All of these types would still be subsumed under the heading of constructional change, which signifies that the changes affect individual form-meaning pairs and their connections (cf. Hilpert, 2013, p. 13), and not the language system as a whole.
> (Hilpert, 2018, p. 31)

Hilpert relies on the definitions for constructional change and constructionalization offered in Traugott & Trousdale (2013) and referred to above. In this approach, constructional changes, on the one hand, are seen as "changes in meaning or form alone that affect individual constructions", and constructionalizations, on the other hand, are defined as "changes that result in $form_{new}$-$meaning_{new}$ pairings after a series of small-step constructional changes" (Traugott & Trousdale, 2013, p. 44;

7. Diewald (2006) aligns specific necessary stages in the diachronic development of grammaticalized modals to specific types of constructions, and argues for a close relation between diachronic construction grammar and grammaticalization.

cf. also Traugott, 2014, 2015, and Diewald 2015). As for constructional changes, Traugott (2014, p. 89) offers a specification, where constructional changes are seen as "changes to features of constructions, such as semantics (e.g. *wif* 'woman' > 'married woman') or morphophonology (e.g. *had* > *´d*). Such changes precede or follow constructionalization". As can be derived from this description the term "constructional change" is used as a summarizing label of semantic and phonological changes of various subtypes, all of which have been known in diachronic linguistics to occur independently as well as in grammaticalization processes.

Looking more closely at these definitions leads to the suspicion that they contain a logical inconsistency which may aggravate the persisting problem of distinguishing (new) constructions from modifications of constructions. If it is the case, as the authors assume, that there are always constructional changes in form or meaning as some sort of "preparatory" condition before true constructionalization (sign creation) takes place, then the definition of constructionalization as "$form_{new}$-$meaning_{new}$ pairings" is erroneous. If there were preparatory changes in form or meaning that deviated from the prior construction and are kept in the new construction, then the latter per definition can never result in a sign that is a pairing of new-only components (which is not how language change works anyway). That is: The above definition ignores the constitutive function of the connection between a form and a meaning for the definition of a linguistic sign (i.e. construction). It is the newness of the connection between the formal and the semantic side that creates a new sign. This is, of course, the essence of de Saussure's definition of a sign, as a unique and "primitive" association (i.e. connection) between a particular schema of meaning ("concept", called "signifié") and a particular schema of form ("sound-image", called "signifiant").[8] In short, it is not only important to investigate relations between signs (or constructions) but also the fundamental semiotic link inside a sign or construction (the irreducible association of a *signifiant* and a *signifié*) which turns it into a linguistic entity to begin with.

Heeding this, the only correct definition of "constructionalization", i.e. the coming into existence of a *new* sign, can be that it is a *new connection* of a form and a meaning (both of which may have been components of different signs before, i.e. both of which may be "old"). Adopting and adapting the notation suggested in Traugott & Trousdale (2013), constructionalization can be rendered as:

8. Cf. the definition of the linguistic sign as "a two-sided psychological entity" and its explanation: "The two elements are intimately united, and each recalls the other. Whether we try to find the meaning of the Latin word *arbor* or the word that Latin uses to designate the concept 'tree', it is clear that only the associations sanctioned by that language appeal to us to conform to reality, and we disregard whatever others might be imagined." (de Saussure, 1983/1916, pp. 66f.).

Constructionalization (creation of a new sign):
$\text{form}_{+/-\text{new}}$ – $\text{CONNECTION}_{\text{new}}$ – $\text{meaning}_{+/-\text{new}}$.

That is, the question whether there is a new sign in the language cannot be answered by checking the newness of one or both of its structural components (*signifiant* and *signifié*), but only by looking at the essential connection between both, and by checking whether this is a new connection/association. This is done by using the known tests for syntagmatic and paradigmatic surroundings (oppositions) of the new sign, and in the case of grammaticalization by testing the degree of integration into a grammatical paradigm. In the following, we adhere to this conception of a new construction as a *new connection* of a form and a meaning, and apply this to our classification of the individual constructions of *verdienen* & X.

2.2 Deontic modality

Claiming that *verdienen* is on the rise as an auxiliary-like verb of deontic modality it is necessary to briefly lay out the definition of deontic modality we use here, its semantic specifications and its place in the general semantic domain of modality (cf. van der Auwera & Plungian, 1998). As modality like e.g. temporality is among the most widely investigated functional-semantic domains in language, it is out of the question to provide an overview of the whole area; thus, we have to confine ourselves to briefly marking our position. We treat modality from the perspective of grammaticalization theory as a functional domain that has (i) a more grammaticalized pole, which is relatively well defined as it pertains to (the expression of) grammatical mood, i.e. paradigmatic distinctions concerning indexical factuality judgements of whole propositions (verbal moods and corresponding periphrases) as well as the management and indication of illocutionary forces (cf. "sentence mood" etc.), and (ii) a more lexical pole, which encompasses several but loosely circumscribed semantic fields having to do with the characterization and evaluation of primary events by secondary (modal) predications (cf. Diewald, 1999, Lyons, 1977, Bybee, Perkins & Pagliuca, 1994, Lehmann (2015 [1982]).

We restrict the following discussion to those notions we need for an informed judgement on the deontic features of the different constructions with *verdienen*.

2.2.1 *Obligation and permission*

We define deontic modality in a narrow sense. Following Lyons (1977, p. 823) deontic modality "is concerned with necessity or possibility of acts performed by morally responsible agents" (see also Heine & Kuteva, 2002, p. 19). It is possible to unite all qualities implied in this statement in the two basic notions *obligation* and *permission*. Their common feature, which distinguishes them from volitional and

dispositional modalities, is the fact that they involve some entity as the source of a directive act, i.e. an entity issuing an act of obligation or permission. This entity is a specific instantiation of the modal source, which is a central component of any modal relation. Its specific features characterize the modal relation as a deontic one as opposed to volitional, epistemic etc. (Lyons, 1977, p. 824; Plank, 1981, p. 69, Diewald, 1999).

The modal source in deontic modality (as expressed e.g. by the German modal verb *sollen* 'have to', 'shall') is positioned outside the domain of the subject of the sentence, which can be noted by the feature [–internal] (Diewald, 1999, p. 94f.; cf. also the notion "extrasubjektiv" as proposed by Bech, 1951, p. 7). This distinguishes deontic modality from other types of modality, like e.g. volitional modality in which case the modal source is located in the subject of the sentence and assigned the feature [+internal] as e.g. in German *wollen* 'want', 'wish', 'will'.

While the external location of the modal source is essential, additional features may lead to sub-types of deontic modality. As Lyons (1977, p. 825) points out, "different kinds of deontic modality can […] be distinguished by specifying the source or cause of the obligation". Features relevant for a more fine-grained sub-classification of deontic modality are e.g. the concreteness and animacy of the modal source (and also of the carrier/recipient of the deontic state, see below). This can be represented by the feature opposition [+/– diffuse], whereby typical deontic sources display the feature [–diffuse] as they typically are human agents (cf. Diewald, 1999, pp. 96f.).[9] The distinction between weak obligation and strong obligation, which is often addressed in descriptions of modal meanings (e.g. Bybee, Perkins & Pagliuca, 1994, p. 186), and which is also relevant for the modal meaning in the case of *verdienen*, as it represents weak obligation (cf. the English translation by 'should') rather than strong obligation, can – partly – be put down to the specification of the modal source as more or less diffuse.

Apart from the modal source in deontic modality, there is another participant playing a major role in the deontic relation. It is the recipient/carrier of the deontic state, i.e. the entity that at the same time is conceived as the target of the command or permission and as the prospective agent fulfilling the action encoded in the infinitive construction. This role is prototypically encoded in the subject of the modalized sentence and it prototypically represents a human agent, i.e. it comes with the features [+internal], [–diffuse] (but see exceptions below under wide scope).

In short, in deontic modal relations expressing *obligation* and *permission* the modal source has the features [–internal] and [–diffuse]. The following examples

9. By this feature it is possible to distinguish deontic modals like *sollen* and *dürfen*, with a [–diffuse] modal source, from dispositional ones like *müssen* and *können*, with a [+diffuse] modal source, see Diewald (1999, p. 98).

with modal verb constructions with *sollen* (for 'obligation') and *dürfen* (for 'permission') represent prototypical cases:

(5) *Die Teilnehmer* ***sollen*** *sich einen*
The participant-PL.NOM should-AUX.MOD oneself-PL.DAT an-ACC
Überblick über das Bildungssystem ***verschaffen***
overview-M.ACC of the education system-OBJ.PREP[10] gain-INF
'The participants *are to / are requested to / should* gain an overview […].'
(DWDS CC20)[11]

(6) *Sie* ***dürfen*** *eine eigene Meinung* ***haben***
They-NOM may-AUX.MOD an-ACC own point of view-F.ACC have-INF
und uns ***kritisieren*** (DWDS CC20)[12]
and us-ACC criticize-INF
'They *are allowed to / are permitted to / may* have their own point of view and criticize us.'

Obligation (*sollen*) and permission (*dürfen*) share the two basic features mentioned above concerning the modal source: They both require an external modal source which is concrete. In both cases, there is someone (a person or institution or alike) not expressed in the sentence who has the role of the modal source, i.e. the issuer of a command directed at the subject *die Teilnehmer* in (5), and the issuer of a permission directed at the subject *Sie* in (6).

Beside this similarity between obligation and permission we also have to take into consideration that there is an important difference between these two deontic modal spheres concerning the sequence of the directive speech acts included in deontic modality: Obligation is initiated and enacted by the modal source, while in the case of permission, it is the recipient of the deontic modal impulse (the directive) who has initiated it. "Permission" actually means that the recipient has asked for it before and the modal source reacts to this request and issues a permission.[13] That is, the modal source can be reactive (permission, *dürfen*) or non-reactive (obligation, *sollen*). In this way *dürfen* can be assigned the semantic feature [+reactive], whereas *sollen* receives the feature [−reactive] (Diewald, 1999, pp. 128f.). It should be noted that the opposition [−reactive] vs. [+reactive] is not restricted to deontic

10. OBJ.PREP stands for "prepositional object".

11. Die Zeit, 22.12.1998, No. 53

12. Archiv der Gegenwart, 2001 [1985]

13. As always there are degrees of abstraction for this relation, e.g. the asking for it does not always take place in a literal way.

modality, where it is correlated with 'obligation' vs. 'permission' respectively, but is relevant in the classification of other subtypes of modality as well. For example, the opposition between the two volitional modal verbs in present-day German, *wollen* ('want', 'intend', 'will'), and *möchten* ('would like to') as in *Sie will aufs Land ziehen* ('She wants to move to the countryside') vs. *Sie möchte aufs Land ziehen* ('She would like to move to the countryside'), is parallel to the opposition between the deontic modals *sollen* and *dürfen*, insofar as *wollen* and *sollen* share the feature [−reactive], while *dürfen* and *möchten* share the feature [+reactive] (for an extended discussion of these feature distinctions see Diewald, 1999 and 2000).

Summing up, we can illustrate *sollen* (standing for obligation) and *dürfen* (standing for permission) using the basic semantic features concerning the modal source in deontic modality introduced so far as follows:

sollen: [−internal], [−diffuse], [−reactive]
dürfen: [−internal], [−diffuse], [+reactive]

The above definition of deontic modality and the three types of features [+/−internal], [+/− diffuse], and [+/− reactive], will play an important role in analyzing the path of semantic development of the verb *verdienen* on its way of being grammaticalized as an auxiliary of deontic modality.

If needed, the semantic specification of these essential features for a deontic modal relation can be refined to distinguish notions like physical force, intersubjective power/status, moral obligation, general codes of behaviour, legal institutions, etc. These different types of modality are often expressed in speech act classes, speech act verbs and modal expressions (modal verbs, modal adverbs, nominalizations, etc.): *order, command, request, allow, be obliged, be required,* etc. As we are dealing with one modal expression only, it is not necessary to discuss this further. Instead, the stativity of modal predicates and the variations of scope require some comments.

2.2.2 *Stativity and scope*

Though deontic modality has to do with directive speech acts, it is very important to note that modalized sentences of the sort we are dealing with here (modal verb & infinitive construction) do not have a directive illocutionary force per se, i.e. they are not like imperatives. Instead, they are modal predicates representing the fact that a directive speech act has been performed. In short, deontic modal predicates express states that are the result of previous directive acts. This is reflected in the paraphrases given above in Section 2.2.1 for (5) 'be to / be requested to / should' and (6) 'be allowed to / be permitted to / may'. A declarative sentence with a deontic modal construction is the representation of the fact that there exists an obligation /

a permission (a modal state) due to an earlier directive (cf. Lyons, 1977, pp. 828–36; Diewald, 1999, pp. 120f.). In the case of obligation, for instance, Lyons (1977, pp. 833f.) states: "the interpretation that is required, however, is one under which 'obligate' is taken to denote the state resulting from, initiated by, some previous event or act".[14] In short, modal predicates are stative (or better: stative-resultative) predicates,[15] and, as they consist of a modal verb and an infinitival complement, they are complex stative predicates. The type of modality (permission, command, etc.) is then expressed in the modal verb, while the content of the directive is expressed in the non-finite part.

A further important notion for the interpretation of modal expressions (in particular verbal constructions) is "scope". While this term is mostly used for the description of the semantic extension of adverbials (cf. verb phrase scope, sentential scope, utterance scope), it has proved an important notion in the investigation of the auxiliarization of verbal expressions towards modal auxiliaries (cf. Nordlinger & Traugott, 1997, who introduced this notion into the investigation of the grammaticalization of modal verbs; Diewald, 1999, who systematically applied this notion in the description of the successive steps in grammaticalization scenarios).

In an investigation of modal predicates, it is useful to distinguish two types of scope: *narrow scope modality* and *wide scope modality*. In case of narrow scope the deontic state is predicated of the subject of the sentence, which means that the subject is in the state of having been given an order or permission (by the modal source) to perform what is expressed in the infinitive complement. These are the uses of modal verbs which are commonly referred to as their 'deontic', 'agent-oriented' or 'non-epistemic' use (cf. Lyons, 1977; Plank, 1981).

In wide scope uses, the modal state is not predicated of the subject of the sentence, but of the whole proposition, which represents a similarity to the function of sentence adverbials. In the case of deontic modality this means that a state of permission/obligation applies to (modifies) the whole proposition. Sentences like the following ones illustrate wide scope readings with *dürfen*:

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14. Cf. also Lyons (1977, p. 836): "To assert that an obligation holds is to perform the same kind of act as we perform when we assert that a proposition is true."

15. Labels like "agent-oriented", "dynamic", etc. tend to blur this essential feature, namely, that modal verb constructions are stative: they predicate a modal state on the subject following from a directive given earlier. Thus, the subject of such a modal sentence is not so much an agent as a combination of three roles: former recipient of the underlying directive, actual carrier, i.e. experiencer, of the deontic state resulting from the directive, and prospective agent of the content of the directive.

(7) ***Es*** ***darf*** *keine Parteien* ***geben,*** *die*
It-NOM may-AUX.MOD no party-PL.ACC exist-INF which-REL
sich Sabotage zum Ziel gesetzt
oneself-PL.DAT sabotage-F.ACC as goal-OBJ.PREP set-PST.PTCP
haben. (DWDS CC20)[16]
have-AUX.PRF
'It is not allowed/permitted/it may not come to the situation: There exist parties which regard sabotage as their goal.'

(8) *Solidarität* ***darf*** *aber nicht* ***mißbraucht*** ***werden*** […]
Solidarity-NOM may-AUX.MOD but not misuse-PST.PTCP AUX.PASS
'It is not allowed/permitted/it may not come to the situation: Solidarity is misused.' (DWDS CC20)[17]

Both sentences show the non-epistemic reading of *dürfen*, i.e. the modal has a deontic meaning in the sense of social obligation/permission. At the same time, however, both modals obligatorily have wide scope. In (7) the wide scope is due to the expletive subject *es* in the idiom *es gibt* ('there is/exists'), in (8) the wide scope is due to the passive morphology of the infinitive *mißbraucht werden*. The person that is the recipient of the prohibition (= negated permission) is not in subject position but is demoted and does not appear in the sentence at all. It can be reintroduced by transforming the sentence in question into a corresponding one with an active infinitive, as in (8′):

(8′) *Niemand darf aber Solidarität mißbrauchen*
Nobody-NOM may-AUX.MOD but solidarity-F.ACC misuse-INF
'Nobody is permitted to/may misuse solidarity.'

Here, the agent of the action described in the infinitive appears as the subject (*niemand*, 'no one'). The modal has narrow scope and predicates the state of being forbidden to complete the action denoted in the infinitive on the subject.

As is to be expected, there are often indetermined cases between different types of wide scope readings (e.g. "wide scope possibility" versus "epistemic possibility" as described in Gamon, 1993, pp. 125, 136, 153), and there are also cases of scope ambivalence. Sentences with a generic or indefinite animate subject are particularly prone to scope and meaning ambivalence (Gamon, 1993; cf. also Nordlinger & Traugott, 1997 for English modals). An example is given in (9):

16. Archiv der Gegenwart, 2001 [1989]

17. Archiv der Gegenwart, 2001 [1970]

(9) *Dies* ***muß*** ***man*** ***wissen,*** *wenn man jetzt*
This-ACC must-AUX.MOD you-NOM know-INF when you-NOM now
die Regierungspropaganda *hört* (DWDS CC20)[18]
the government propaganda-F.ACC hear-PRS.3SG
'You have got to realize this fact when listening to government propaganda.'
(narrow scope)
'It is necessary: you realize this fact when listening to government propaganda.'
(wide scope)

In cases like these, the wide scope reading typically arises as a conversational implicature in the sense of Grice ([1975] 1989). It is the result of a reasoning procedure of the hearer in a specific communicative situation in which the narrow scope reading would not make much sense. In (9) it is unlikely that the speaker wants to predicate something on the subject which is realized by the indefinite pronoun *man*. Instead, the wide scope reading, expressing the general necessity that the proposition *Man weiß dies* ('one knows this') is true, is much more informative.

The development of wide scope readings is a prerequisite for the auxiliarization and grammaticalization of a modal verb towards a fully grammaticalized epistemic marker.[19] In this latter, grammaticalized function the modal expresses a speaker-based factuality judgement concerning the whole proposition. An example of this would be *muss* in *Sie muss aufs Land gezogen sein* 'She must have moved to the countryside', 'Probably, she has moved to the countryside'. The factuality judgement of a grammaticalized epistemic modal (i.e. an auxiliary of verbal mood) applies to the whole proposition, thus, by definition the modal has wide scope (cf. Diewald, 1999). While wide scope of a modal may occur in non-epistemic readings as the above examples (7) and (8) show, grammaticalized epistemic readings presuppose propositional, i.e. wide, scope of the modal verb.

This means that the existence of examples with wide scope interpretations (though still with e.g. deontic meaning) is an important indicator of a relatively advanced stage in the process of grammaticalization towards an auxiliary in the case of modals.[20] The following sections will show the stage of development of an assumed grammaticalization path that *verdienen* & infinitive complement has reached.

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18. Archiv der Gegenwart, 2001 [1971]

19. The term "auxiliarization" focuses on the formal, syntactic and morphological aspects of the grammaticalization of full verbs and modal verbs into auxiliaries as parts of periphrastic verbal constructions; cf. also Heine (1993).

20. Depending on the grammatical category that is the "endpoint" of the grammaticalization / auxiliarization, the item in question may or may not require wide scope. In passive auxiliaries with patient or recipient arguments as subjects there is no wide scope; in mood and tense categories, however, wide scope is a necessary factor as tense and mood operate on whole propositions and not just on verb phrases.

2.2.3 *The rise of modal meaning*

While structural aspects of the grammaticalization of (modal) auxiliaries from lexical verbs have been addressed in Section 2.1, the following is concerned with tendencies and pathways of semantic change in that segment of the modal domain that is relevant for this study. As has been already mentioned, the rise of deontic meaning from verbs having a non-deontic, "merely" lexical meaning has received much less attention than the rise of epistemic meaning from non-epistemic, e.g. deontic meaning.[21] Still, some observations can be found in diachronic studies on Germanic and Indo-European modals as well as in grammaticalization literature. Heine & Kuteva (2002) report on some non-deontic, more lexical sources for verbs (or other linguistic entities) expressing an 'obligation' or 'permissive' meaning. For the development *ability* > *permissive* they quote German *können* (Heine & Kuteva, 2002, p. 27f.), i.e. an old modal verb (a "perfecto-present", cf. Diewald, 1999) which acquired an additional permission sense. As another source for permission, the authors refer to verbs meaning 'get': "GET ('to get', 'to receive', 'to obtain') > PERMISSIVE" (Heine & Kuteva, 2002, p. 147). This semantic development applies via the ABILITY stage, which *get*-verbs typically acquire. Bybee, Perkins & Pagliuca (1994, p. 191) point to the development of English *get* as in *get to* > 'manage to', 'be permitted to', e.g. *I get to sit on Santa's lap*. The notion of 'obligation' as well tends to develop from verbs meaning 'get', as is noted in Heine & Kuteva (2002, p. 145) as "GET ('to get', 'to receive', 'to obtain') > OBLIGATION", and in Bybee, Perkins, & Pagliuca (1994, p. 184), who provide the English example *I've got to study tonight.* According to Heine & Kuteva (2002, p. 119) another source for 'obligation' are verbs meaning 'do' or 'make', as Punjabi *kar* 'do'.[22]

Further hints on possible paths in the deontic domain can be gathered from the study by Ramat (1971) on modal verbs in Germanic languages as a morphosemantic field. Ramat shows that the modal meanings of *sollen* and *dürfen* originate in concepts that are based on an ideology of exchange of gifts, *sollen* originally meaning 'be obliged to give something in return', and *dürfen* meaning 'be in need of something'. Ramat's account strongly supports the definition of deontic modality as being founded in the interaction of morally responsible agents, which are the origins and/or destinations of a transfer of the "deontic content" (i.e. gifts, presents, deeds as obligations, and propositions). Ramat also shows that there is another,

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21. For the change *deontic* > *epistemic* see e.g. Heine et al. (1991, pp. 176ff.), Traugott (1989), Nordlinger & Traugott (1997); for the development *ability* > *root possibility* > *possibility* see e.g. Bybee et al. (1994, p. 194); for *obligation* > *probability* see e.g. Bybee et al. (1994, pp. 224ff.), Diewald (1999) for German, Heine & Kuteva (2002 pp. 218f.); for the development of modal meaning in general also see Sweetser (1990).

22. For further possible source verbs in the deontic domain like *know, leave, need, owe* or *stop* see Heine & Kuteva (2002, p. 193, 215, 227, 243, 283).

similar source for a deontic modal in North-Germanic languages: the etymon of German *gebühren*, i.e. Swedish *böra*, Dan. *burde* (originally 'be befitting', i.e. 'ziemlich sein' 'gehörig sein', 'gebührend sein', see Ramat, 1971, p. 183), has developed from the meaning of 'be befitting' into expressing 'obligation' and 'necessity'. Ramat (1971, p. 200) briefly points to Sanskrit where the verb *árhati* with the original meaning 'to be worthy', 'earn', 'deserve' ('verdienen', 'wert sein') develops deontic modal meanings of obligation and permission as well as necessity.

3. Methods

The methodological procedures used in the present study include the following steps: (a) to identify (semi-schematic) constructions constituted by *verdienen*, (b) to determine a collostructional profile for each *verdienen*-construction identified, and (c) to categorize the most attracted collexemes into semantic groups.

3.1 Data and identification of constructions with *verdienen*

In view of the fact that the synchronic variation of constructions constituted by *verdienen* reflects its diachronic development from a fully lexical item into an auxiliary marker, the present study utilizes a large corpus of German, namely the DWDS Core Corpus for the 20th century (DWDS-Kernkorpus des 20. Jahrhunderts; Geyken, 2007), as a data source for retrieving the usage diversity of *verdienen*-constructions. It contains about 100 million words of written German in a balanced selection of texts from literary, scientific, journalistic, and non-fiction writing.

The data preparation for the present study proceeded as follows. First, all examples with the verb *verdienen* were extracted automatically from the DWDS Core Corpus. Second, they were checked manually to exclude the following instantiations with the verb *verdienen* from the data set and from further (collostructional) analysis: *verdienen* appearing (a) with pronouns referring to nouns in a preceding or following clause, as exemplified in (10), (b) with adjectives with quantitative meaning, as in (11), as well as (c) with object clauses, as illustrated in (12). These restrictions on co-occurring items are applied due to the fact that not functional elements, but lexical complements help to identify or rather co-determine the meaning of the corresponding construction. In addition, the observations with the verb *verdienen* itself occurring in passive form, as in (13), have also been discarded so that the syntactic status of the relevant co-occurring items, i.e. their object status, remains unchanged.

(10) *[…] dass wir zuerst einmal in Urlaub fahren*
that we-NOM first of all on holiday-OBJ.PREP go-INF
dürfen, denn ***verdient*** *haben wir ihn*
allow-AUX.MOD because earn-PST.PTCP have-AUX.PRF we-NOM it-ACC
uns schon lange. (DWDS CC20)[23]
ourselves-ACC well in advance
'… that we are allowed to take leave first of all, because we have earned it for us well in advance.'

(11) *Er dachte wirklich nicht daran, mit dem*
He-NOM think-PRET.3SG even not of with the
Trockenskikurs Ernst zu machen, wenn
indoor skiing lessons-ADV.INS seriousness-M.ACC to make-INF if
er so wenig dabei ***verdiente.*** (DWDS CC20)[24]
he-NOM so little by it earn-PRET.3SG
'He, of course, did not even think of getting down to business with the indoor skiing lessons, if he was to earn so little money by it.'

(12) *Die arme Ophelia hat es nicht* ***verdient,***
The poor Ophelia-F.NOM have-AUX.PRF it-ACC not deserve-PST.PTCP
dass sich jemand über sie mokiert
that oneself-NOM anybody-NOM about her-OBJ.PREP mock-PRS.3SG
'Poor Ophelia has not deserved to be mocked by anybody.' (DWDS CC20)[25]

(13) *[…] damit man nicht sieht, wie viel in dem guten*
so that one-NOM not see-PRS.3SG how much in the big
Geschäft ***verdient*** *wird* (DWDS CC20)[26]
deal-ADV.LOC earn-PST.PTCP AUX.PASS
'… so that nobody can see how much is earned in the big deal.'

Third, the remaining examples representing the final data set were grouped manually according to their formal characteristics. Specifically, we identified three clusters of the observations with *verdienen* occurring with (a) nouns, (b) verbal complements in the passive infinitive form, and (c) verbal lexemes in the active infinitive form. It turned out that within the formal representation with nouns the verb *verdienen* varied in meaning. Consequently, the instantiations of this formal cluster were additionally sorted semantically in two classes. This resulted in

23. Brief von Alois Scheuer an Friedchen Scheuer vom 04.08.1940, Feldpost-Archive mkb-fp-0079

24. Völkischer Beobachter, Berliner Ausgabe, 17.03.1940

25. Die Zeit, 14.10.1999, No. 42

26. Vossische Zeitung, Morgen-Ausgabe, 04.03.1914

abstracting four semi-schematic form-meaning patterns, i.e. constructions, with *verdienen*. Examples are given in (14–17) (cf. also Section 1):

(14) *Nach der Schule wollen viele arbeiten und*
After the school-ADV.TMP[27] want-AUX.MOD many-NOM work-INF and
Geld verdienen (DWDS CC20)[28]
money-N.ACC earn-INF
'After school, many want to work and earn money.'

(15) *Das anregende Buch* ***verdient*** *in weitesten* Kreisen
The inspiring book-N.NOM deserve-PRS.3SG in widest circles-ADV.LOC[29]
Beachtung (DWDS CC20)[30]
attention-F.ACC
'The inspiring book deserves attention in the widest possible circles.'

(16) *Die Karten und Abbildungen* ***verdienen***
The map-PL.NOM and illustration-PL.NOM deserve-PRS.3PL
hervorgehoben zu werden (DWDS CC20)[31]
emphasize-PST.PTCP to be-INF.AUX.PASS
'The maps and illustration deserve to be emphasized.'

(17) *Es wäre denn, daß der Historiker Ideen*
It-NOM be-PRET.SUBJII.3SG because that the historian-M.NOM idea-PL.ACC
und Gesetze gäbe anstatt Tatsachen,
and law-PL.ACC present-PRS.SUBJII.3SG instead of fact-PL.ACC
Unwahrheit anstatt Wahrheit, so daß er nicht mehr ein
untruth-F.ACC instead of truth-F.ACC so that he-NOM no longer a
guter Erzähler, sondern ein schlechter Dichter ***zu heißen***
good narrator-M.PRED but a bad poet-M.PRED to call-INF
verdiente. (DWDS CC20)[32]
deserve-PRET.3SG
'Unless the historian presented ideas and laws instead of facts, untruth instead of truth so that he no longer would deserve to be called a good narrator but a bad poet.'

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27. ADV.TMP stands for "temporal adverbial".

28. Die Zeit, 02.09.1999, No. 36

29. Berliner Tageblatt, Morgen-Ausgabe, 03.03.1910

30. ADV.LOC stands for "local adverbial".

31. Jahresberichte für deutsche Geschichte, 1939, p. 330

32. Mauthner, Fritz: Wörterbuch der Philosophie. In: Bertram, Mathias (Hg.): Geschichte der Philosophie, Berlin: Directmedia Publ., 2000 [1910], p. 25822

These sentences exemplify four constructions representing a combination of the verb *verdienen* with a schematic slot for nouns designating concrete entities ($N_{CONCRETE}$) as well as abstract concepts ($N_{ABSTRACT}$), past participle verbal complements ($V_{PST\ PTCP}$) as part of a passive infinitive and infinitive verbal complements (V_{INF}). The form and the meaning of these four constructions can be represented schematically, as in (18–21).[33] Since our focus is on the object slot of the constructions with *verdienen* the subject position has not been taken into consideration in the present paper.[34] In (20), the verb *verdienen* occurs with $V_{PST\ PTCP}$-lexemes connected to the passive auxiliary *werden*. This passive auxiliary is considered as a fixed constituent of the construction appending the passive interpretation of the verbal complements to the constructional meaning.

(18) verdienen + $N_{CONCRETE}$ <'to earn sth.'>
(19) verdienen + $N_{ABSTRACT}$ <'to deserve sth.'>
(20) verdienen + $V_{PST\ PTCP}$ + zu + werden <'should be done'>
(21) verdienen + zu + V_{INF} <'should do'>

In sum, the distillation of (semi-schematic) constructions with *verdienen* proceeded in a bottom-up fashion, viz. from instantiations to schematic representation through abstraction. Because of the fact that each *verdienen*-construction contains a schematic slot, it is important to identify lexical items which are strongly associated with the corresponding slot and at the same time co-determine the meaning of the construction they occur in. This can be performed by applying a quantitative procedure, namely a simple collexeme analysis, which will be presented in the next section.

In terms of important diachronic stages in the grammaticalization of modal items towards auxiliaries within modal verbal periphrasis, it should be noted that the four constructions isolated here for empirical treatment have been identified as corresponding to relevant stages due to the facts known about these general grammaticalization paths. The construction under (18) represents the full verb usages of *verdienen* with a concrete, typically animate subject and a concrete object, in close parallel to the basic construction of – for example – the modal verb *können* in Old

33. The *verdienen*-construction in (18) and (19) can be used with as well as without the reflexive pronoun *sich* (cf. *Außerdem haben wir* ***uns eine Zigarre verdient*** 'Besides, we have earned ourselves a smoke', DWDS Core Corpus, Lebert, Benjamin: Crazy, Köln: Kiepenheuer & Witsch, 1999 [1999], p. 133). The instantiations with *sich* additionally specify the recipient of EARN- and DESERVE-situations.

34. Doing so does not imply that the subject slot including its semantic and morpho-syntactic features is irrelevant. However, dealing with subjects properties would go beyond the scope of the present paper.

High German, which was primarily found with animate subjects, concrete direct objects, and did not take infinitives as complements (Diewald 1999, pp. 344–346). Constructions like the one in (19) show the loss of subject as well as object restrictions, and in particular, via the possibility of embedding a propositional concept in the still nominal direct object, provide a semantic precondition for a possible (later) reanalysis of the verb (which is still a full verb syntactically in 19) towards auxiliaryhood. Analogous constructions have been isolated e.g. for German *drohen* ('threaten') as its "critical context" on its way towards evidential meaning (Diewald & Smirnova, 2010, pp. 322–323). Construction (20) with a passive infinitive is an essential stage as it coerces a wide scope reading of *verdienen*, which due to the passive morphology of the infinitive does not provide an argument position for the subject. As Diewald (1999) shows this is an essential stage in the rise of more grammaticalized readings of the modal verbs in German. Wide scope is not dependent on passive morphology of the embedded infinitive and can be triggered by other factors. However, wide scope can easily be asserted in this construction on the basis of structural factors, which makes constructions like (20) valuable in ascertaining the existence of wide scope readings in actual examples (cf. also Nordlinger & Traugott, 1997). In a diachronic investigation on the rise of *verdienen* as a deontic modal, which has not yet been completed, this construction may turn out to be the isolating context for the new modal meaning which clearly separates it from the older more lexical meaning, which, in turn, includes an actional component and an agent-like role for the subject (for context types like critical context and isolating context, cf. Diewald, 2006). The construction in (21) represents the wide scope deontic modal meaning that is the current (preliminary) end-point of the grammaticalization of this verb. Its meaning is specific to this verb in opposition to other deontic modals (i.e. *sollen* and *dürfen* in modern German), and is dealt with in the discussion in Section 5.

In short, the four constructions identified and selected for the synchronic reconstruction of a grammaticalization path of *verdienen* are legitimized by the attested constructional stages of the grammaticalization paths of several modal and evidential verbs in German. Though, of course, the reconstruction of a diachronic pathway based on synchronic variation remains speculative until extended diachronic evidence has been brought forward, the one suggested here is based on solid evidence and knowledge of related cases so that the speculative component is minimized.

3.2 Simple collexeme analysis

In usage-based construction grammar, it is assumed that the meaning of a (semi-schematic) construction tends to harmonize with meanings of lexemes appearing in its schematic slot (see Hilpert, 2014, p. 392). Accordingly, the lexical items occurring in an empty slot of the corresponding *verdienen*-construction play an important role for understanding its meaning. In addition, not all lexical elements contribute to the same degree to a constructional meaning, viz. some items are more typical, whereas others are less typical or even untypical. The identification of the most central slot fillers for each *verdienen*-construction, which constitute the semantic core potential of each construction, is achieved in the present study by applying a simple collexeme analysis (Stefanowitsch & Gries, 2003). This quantitative technique aims to quantify the mutual association between the respective *verdienen*-construction and lexical elements of its schematic slot. As a result, this allows us to rank all lexemes according to their respective association, i.e. collostruction, strength displaying co-occurrence typicality.

In the present paper, we use the G^2 statistic of the likelihood ratio test (Dunning 1993) for quantifying collostruction strength (see Evert, 2008; Wiechmann, 2008; Pecina, 2010 for further possible association measures, and their pros and cons). This association measure has been chosen predominantly because of the following computational advantages: (a) it can calculate collostruction strength for low frequency items in comparison to measures overestimating this, for example, pointwise mutual information (Church & Hanks, 1990); (b) it is able to provide quantitative scores at any rate and at all time in contrast to (the negative logarithm to the basis of 10 of) the p-value of Fisher-Yates exact test (i.e. the most frequently used measure in studies applying collostructional analysis), which in cases of extreme high association provides only a not interpretable label "INF".

The application of significance tests (i.e. the likelihood ratio test as well as the Fisher-Yates exact test) for computing collostruction strength is frequently criticized because such applications violate the assumption of independence of observations (i.e. many observations can be produced by the same speaker) as well as the randomness assumption (i.e. constructions and lexemes are not distributed randomly) (see e.g. Schmid & Küchenhoff, 2013; Koplenig, 2017). Having said that, the remaining association measures that are not based on inferential statistics possess the same problem: their scores can be biased to some extent as well, if for example the majority of observations are generated by one or two speakers (see Gries, 2015, pp. 518–519). In view of this, we utilize the G^2 statistic of the likelihood ratio test in spite of going against the assumptions of significance tests mentioned above.

The simple collexeme analysis computes the collostruction strength, i.e. the G^2-score, for each lexical item on the basis of the contingency table filled with the

frequency information retrieved from the corpus chosen. For performing this procedure, the following kinds of frequencies are needed: (a) the occurrence frequency of a given lexeme in a construction, (b) the overall frequency of that construction in the corpus, (c) the overall frequency of a given lexeme in the corpus, and (d) the overall frequency of all items in the corpus representing the functional category of a schematic slot of a construction.

Table 1 exemplifies which frequencies are required in this study for the verbal lexeme *genannt* ('named') occurring in the $V_{PST\ PTCP}$ slot of the *verdienen*-construction with the deontic (passivized) meaning 'should be done' (cf. (20) in 3.1) and can be easily queried in the DWDS Core Corpus for the 20th century.

Table 1. Input to a simple collexeme analysis for one lexical verb in the *verdienen*-construction

	***genannt* ('named')**	**¬ *genannt* ('named')**	**TOTAL**
verdienen-cx	A 43	B (= 358 – A)	**358**
¬ *verdienen*-cx	C (= 8729 – A)	D (= 2138865 – (A + B + C))	C + D
TOTAL	**8729**	**B + D**	**2138865**

The lexeme *genannt* occurs 43 times in this *verdienen*-construction. The frequency of the *verdienen*-construction accounts for 358 occurrences in the DWDS Core Corpus. The overall frequency of the lexeme *genannt* (i.e. only in past participle form) in the DWDS Core Corpus amounts to 8729 tokens. The overall frequency of all items instantiated as past participles in the DWDS Core Corpus is 2138865. All these four frequencies are necessary to fill out the remaining cells of the contingency table and for then quantifying the mutual association between the *verdienen*-construction and the lexical item *genannt*.[35] After applying this procedure to all occurring items, they are ranked according to their collostruction strength showing their usage typicality in (the schematic slot of) this construction.

3.3 Semantic classification of strongly attracted lexemes

In order to ascertain which semantic clusters are conceptualized by the most strongly attracted items of each *verdienen*-construction, we grouped the latter into semantic classes. Consequently, the most represented semantic groups will mirror the main semantic trend in usage behavior of the corresponding *verdienen*-construction.

35. We used the R-package "collostructions" (Flach, 2017) for performing a simple collexeme analysis.

For this reason, we utilized the inventory of semantic categories for verbal and nominal meanings created by GermaNet, a lexical-semantic net that connects German nouns, verbs, and adjectives semantically by grouping lexemes expressing the same concept into synonymic sets (Hamp & Feldweg, 1997).[36] Despite the fact that GermaNet is organized in the form of semantic taxonomies of (nominal and verbal) concepts enabling to extract similarity scores between paired (meanings of) items that could be used consequently as input for such automatic categorization techniques as cluster or network analysis (see e.g. Gries & Ellis, 2015; Dekalo & Hampe, 2017), the classification procedure in this paper is performed manually.

The inventory of classes for verbal meanings consists of 15 groups, namely *possession, location, emotion, social situation, body, cognition, communication, competition, contact, natural phenomenon, creation, change, consumption, perception* and *stative situation*. The meanings of nouns are divided into 23 classes, namely *artifact, attribute, possession, relation, event, shape, feeling, group, body, cognition, communication, quantity, person, motive, food, natural object, natural phenomenon, location, plant, substance, animal, time* and *tops*. Notwithstanding that some classes are semantically considerably broad (e.g. verbal meanings of social situations describing various aspects of social events, which form one of the largest groups in GermaNet, and could be subdivided into a number of sub-categories), we apply these two classifications mostly because of the following reasons. First, an external semantic class inventory increases objectivity decreasing our subjective impact on class creation. Second, GermaNet seems to be the most comprehensive set of semantic categories for all German verbs and nouns available at the present time.

It was necessary to individually assess the most attracted complements identified by a simple collexeme analysis because the simple collexeme analysis is a form-based procedure not taking polysemy of slot-fillers into account. Therefore, we applied manual semantic categorization on the basis of the GermaNet semantic classes, and separated different senses of each item in its respective instantiations. What is more, the simple collexeme analysis is regarded as an explorative procedure which is used for ranking lexical items. It does not offer direct evidence for the reconstruction of the grammaticalization path of *verdienen*. Nevertheless, the results of this method are used for ascertaining the central semantic classes of the co-occurring lexemes, which allows us to understand the constructional variation of *verdienen*, i.e. steps within its diachronic development.

36. We thank the University of Tübingen (especially Prof. Dr. Erhardt W. Hinrichs) for granting us an Academic Research License to use GermaNet.

4. Results

The four *verdienen*-constructions under scrutiny differ greatly in their token frequency in the DWDS Core Corpus for the 20th century (see Table 2). The *verdienen*-construction expressing the lexical meaning 'to deserve sth.' is the most frequent construction, containing 1936 instantiations. The *verdienen*-construction with the meaning 'to earn sth.' indicates a token frequency of 1117 occurrences. The *verdienen*-construction with past participle verbal complements conceptualizing the grammatical meaning 'should be done' appears comparably rarely in written German, namely 358 times. Finally, the *verdienen*-construction with infinitive verbal lexemes is an extremely infrequent construction occurring only 58 times. The distributional tendency of the type frequency, viz. the number of unique lexical items in the corresponding schematic slot, is highly similar to that of the token frequency.

Table 2. Token and type frequencies of (slot fillers of) four *verdienen*-constructions

CONSTRUCTION	TOKEN FREQUENCY	TYPE FREQUENCY
verdienen + $N_{CONCRETE}$	1117	160
verdienen + $N_{ABSTRACT}$	1936	401
verdienen + $V_{PST\ PTCP}$	358	129
verdienen + V_{INF}	58	26

The most attracted lexical items (see Table 3, appendix) of the *verdienen*-construction with a schematic slot for nouns designating concrete entities possess low semantic variability. They represent primarily two semantic categories: possession and quantity. Nouns of possession comprise such lexemes as *Geld* ('money'), *Brot* ('bread'), *Lebensunterhalt* ('livelihood'), *Unterhalt* ('livelihood'), *Prämie* ('bonus'), *Lohn* ('wage'), *Zubrot* ('extra income'), *Lebensbedürfnis* ('life necessity'), *Taschengeld* ('pocket money'), *Provision* ('brokerage'), *Vermögen* ('property'), *Cash* ('cash money'), *Heidengeld* ('a lot of money'), *Summe*$_1$ ('money'),[37] *Westgeld* ('West German money'). Another semantic group of central items includes nouns of quantity denotating diverse currency units and coins (*Mark, Dollar, Pfennig, Groschen, Taler, Heller, DM, Franken, Sou, Franc, Goldmark, Schilling, Mk*) as well as different amounts of quantity (*Million* ('million'), *Summe*$_2$ ('amount')). The nouns of possession represent items operating as generic terms for nouns of quantity not specifying an exact amount earned.

37. Subscript numerals mean that a given item expresses more than one meaning within the corresponding construction. In other words, such items can be found in several semantic classes at the same time.

In contrast to the *verdienen*-construction expressing the meaning 'to earn sth.', the core potential of the collostructional profile (see Table 4, appendix) of the *verdienen*-construction occurring with nouns indicating abstract concepts semantically varies to a considerably higher degree. We assigned these nouns to the following six semantic domains: cognition, communication, event, attribute, feeling, natural phenomena. Such lexemes as *Beachtung* ('attention'), *Name*$_1$ ('reputation'), *Aufmerksamkeit*$_1$ ('attention'), *Anerkennung*$_1$ ('validation'), *Interesse*$_1$ ('interest'), *Achtung* ('respect'), *Bewunderung* ('admiration'), *Respekt* ('respect'), *Glauben* ('belief'), *Behandlung*$_1$ ('coverage'), *Verachtung* ('contempt'), *Untersuchung*$_1$ ('examination') belong to nouns of cognition. Nouns of communication are represented by the items *Erwähnung* ('mention'), *Name*$_2$ ('name'), *Anerkennung*$_2$ ('appreciation'), *Dank* ('gratitude'), *Ehrentitel* ('honorary title'), *Untersuchung*$_2$ ('study'), *Ehrenname* ('honorary name'), *Beiname* ('surname'), *Beifall* ('applause'). The lexemes *Lob* ('praise'), *Hervorhebung* ('emphasis'), *Strafe* ('punishment'), *Nachahmung* ('imitation'), *Verbreitung* ('distribution'), *Behandlung*$_2$ ('attention'), *Würdigung* ('appreciation'), *Schonung* ('protection') are assigned as nouns of event. These three classes appear to be the largest ones. Another three semantic groups are comparatively underrepresented within the most attracted items: nouns of attribute (*Vorzug* ('priority'), *Aufmerksamkeit*$_2$ ('interest'), *Interesse*$_2$ ('interest'), *Bezeichnung* ('indication')), nouns of feeling (*Vertrauen* ('reliance'), *Mitleid* ('compassion')) and a noun of natural phenomena (*Tod* ('death')).

The typical items (see Table 5, appendix) of the *verdienen*-construction conceptualizing the grammatical meaning 'should be done' are extremely varied from a semantic point of view. They have been organized into 11 semantic categories. Verbs of communication (*hervorgehoben* ('emphasised'), *erwähnt* ('mentioned'), *bemerkt*$_1$ ('commented'), *angemerkt* ('commented'), *gewürdigt* ('appreciated'), *gelobt* ('praised'), *abgemeiert* ('ruined'), *gebrandmarkt*$_1$ ('marked'), *anerkannt*$_1$ ('accepted')) and verbs of cognition (*festgehalten* ('recorded'), *beachtet* ('respected'), *gelesen* ('read'), *verachtet* ('despised'), *anerkannt*$_2$ ('recognised'), *aufgenommen*$_1$ *(in den Spielplan)* ('included'), *geachtet* ('respected'), *auseinandergenommen* ('disconstructed, analyzed), *betrachtet* ('observed')) are the most representative classes. Such semantic domains as perception, change, and social situation are constituted by fewer lexemes: verbs of perception (*bemerkt*$_2$ ('noticed'), *vermerkt* ('recorded'), *aufgenommen*$_2$ ('received'), *registriert* ('recorded')), verbs of change (*gehängt* ('hung'), *aufgeknüpft* ('hung'), *eingesperrt* ('locked-in'), *totgeschossen* ('shot to death')), social verbs (*genannt* ('named'), *gebrandmarkt*$_2$ ('denounced'), *aufgenommen*$_3$ ('included'). The remaining five semantic groups contain only a single exemplar: a verb of possession *entrissen* ('snatched), a stative verb *angereiht* ('arranged'), a verb of contact *angebaut* ('cultivated'), a verb of bodily activity *angespuckt* ('spat

on'), a verb of creation *umgeschrieben* ('rewritten'), and a verb of emotion *angebetet* ('worshipped').

Similarly to the previously treated construction, the central lexical elements (see Table 6, appendix) of the *verdienen*-construction expressing the grammatical meaning 'should do' indicate a high semantic variability. Stative verbs appear to be the most salient category, including such items as *leben* ('live'), *fortleben* ('live on'), *sein* ('be'), *tragen* ('bear'), *wohnen* ('reside'). The lexemes *einnehmen (einen Platz)* ('occupy'), *kommen*$_2$ ('come') and *laufen* ('walk') are qualified as verbs of motion. The items *heißen*$_1$ ('mean') and *kommen*$_1$ *(zu Wort)* ('get a chance to speak') belong to verbs of communication. Such verbal complements as *eingehen (in die Geschichte)* ('go down in history') and *füllen (die Spalten)* ('fill the columns') represent verbs of change. The remaining semantic groups are represented by only a single element: a verb of cognition, namely *beschäftigen* ('deal with'), a social verb, *heißen*$_2$ ('be called'), a verb of bodily activity, *sterben* ('die'), and a verb of emotion, namely *genießen* ('enjoy').

5. Discussion

After introducing the four relevant semi-schematic constructions with *verdienen* in Section 3 and describing them with regard to their schematic nominal or verbal slot in Section 4, the question arises what these results tell us in terms of grammaticalization and what conclusions can be drawn from our synchronic data that support our hypothesis.

Our claim is that *verdienen* combined with an infinitive (cf. (3) and (4) in Section 1 and (16)–(17) in Section 3.1) is about to turn into a deontic modality construction, whereby *verdienen* is in a process of grammaticalization leading from a full lexical verb towards a modal auxiliary. Assuming that synchronic variation reflects diachronic development in grammaticalization with the less grammaticalized synchronic variants representing the diachronically older usages, we can interpolate a diachronic grammaticalization path from the observation of synchronic variation in degrees in grammaticalization. As shown in Sections 3 and 4, the item-driven analysis of slot-fillers of each *verdienen*-construction, viz. the ranking of the lexical elements according to their usage typicality and the semantic categorization of the most attracted lexemes, displays the central tendency in usage behavior. In connection with the concept of context expansion, especially with the notion of "host-class expansion" (Himmelmann 2004), these data allow us to construct probable stages of the grammaticalization path of the verb *verdienen*. According to Himmelmann grammaticalization can be regarded as a "process

of context-expansion" (2004, p. 32) happening on different levels and in different dimensions.[38] So, the elements *verdienen* is in construction with, i.e. its hosts, can change their semantic and morpho-syntactic class which leads to what is referred to as host-class expansion. Taking the object slot, Section 4 has shown that the object hosts of *verdienen* synchronically vary by expanding their semantic class from concrete to abstract (cf. 14 and 15 in 3.1) and their morpho-syntactic class from NP to verbal complement (cf. 15 and 16 in 3.1) and from passive infinitive to active infinitive (cf. 16 and 17 in 3.1).

According to these observations the grammaticalization path of *verdienen* towards a deontic modal can be conceived as follows, with "LEX" representing stages of (more) lexical usage, while "GRAM", i.e. constructions with infinitival complements, are usages that are grammaticalized to some degree (cf. Sections 1 and 2 on the impact of infinitives in auxiliarization processes):

LEX 1 (verdienen + $N_{CONCRETE}$) > LEX 2 (verdienen + $N_{ABSTRACT}$) >
GRAM 1 (verdienen + $V_{PST\ PTCP}$ + zu werden) > GRAM 2 (verdienen + V_{INF})

The rest of this section provides some further discussion of each of these stages.

Lex1 and Lex2

The first construction presents *verdienen* in combination with a concrete accusative object as a full verb, which is dynamic and refers to an action carried out by an animate (typically human) being. The full verbal scene includes someone doing something, which is typically associated with lexemes like *effort, duty, task, work*. As a result of this activity, the subject receives something in return that is represented by the accusative object, which in the most lexical construction LEX1 is constrained to the types of concrete nouns listed in Table 3 (see appendix). The construction LEX1, which is the source of the grammaticalization path of *verdienen* as a deontic marker, can be informally noted as below; (22) presents another typical example of this construction.

38. Cf. Himmelmann's approach (1997), which differentiates between changes in semantics and pragmatics („Ausweitung des Gebrauchskontexts", p. 28) and changes on the syntagmatic level. In addition to this, construction-internal and construction-external properties are taken into consideration as well (Himmelmann, 2004, p. 32).

Construction Lex1
Form: verdienen (& X) & NPAcc (with NConcrete)
Meaning: 'to receive something in return for an action fulfilled'
Typical example:

(22) *Sie* *wohnen* *in drei* *Zimmern* *und der Vater*
They-NOM live-PRS.3PL in three room-PL.ADV.LOC and the father-M.NOM
verdient ***40 DM*** (DWDS CC20)[39]
earn-PRS.3SG 40 DM-F.ACC
'They live in three rooms and their father earns 40 DM.'

LEX1 contains *verdienen* as a full verb in a transitive construction. Accordingly, it can be passivized, as in "*Viel Geld wird in der Erlebnis-Gastronomie verdient*" 'A lot of money is earned in event catering.'

The second construction superficially looks the same. However, in object position we have abstract nouns, often verbal nouns referring to a propositional content (*Beachtung, Hervorhebung, Anerkennung, Interesse*, see Table 4, appendix). This propositional content (as is typical for nouns) is neither tensed nor specified as to degrees of factivity. The 'interest', 'recognition', etc. may be granted to the subject at the time of utterance, or the speaker/writer claims that this is not the case but that this should happen in the future. In other words, the speaker/writer suggests that a certain state of affairs, which includes a socially relevant evaluation, applies to the situation. The core meaning of *verdienen* in this construction, which has been glossed here by 'deserve', contains an evaluative component (concerning quality and moral standards) which can be paraphrased as: 'Someone or something has a certain quality that is a good reason (in the eyes of the speaker/writer) for others to give some psychological/abstract gratification to this someone or something'. The major components of the construction LEX2 are given below together with a typical example in (23):

Construction LEX2
Form: verdienen (& X) & NPAcc (with NAbstract, propositional content, valency)
Meaning: 'Someone or something has a certain quality that is a good reason (in the eyes of the speaker/writer) for others to give some psychological/abstract gratification to this someone or something'

39. Kursbuch, 1971, Vol. 24

Typical example:

(23) *Die Edition* ***verdient*** *die größte* ***Anerkennung***
The edition-F.NOM deserve-PRS.3SG the-ACC greatest appreciation-F.ACC
'The edition deserves the greatest appreciation.' (DWDS CC20)[40]

In LEX2, *verdienen* is no longer a simple transitive action verb (cf. the impossibility of the passive of *verdienen* here: **Durch die Edition wird große Anerkennung verdient)*. In this construction, we no longer have a transitive scene: the subject is no longer an agent of an activity, there is neither intention nor effort. Though some of these meaning components may be present in some examples, they represent concomitant, non-obligatory features of this construction.

Movement along the grammaticalization path from LEX to GRAM

Looking at the first step of the grammaticalization path, i.e. from LEX1 to LEX2, it is apparent that both constructions exhibit the same formal characteristics, in particular the syntactic structure concerning their slot-fillers in complement position. They vary merely in the abstractness of the lexical items. Thus, at first sight these constructions, due to their formal similarity, might be regarded as a single construction attracting nouns of diverse semantics. However, as we define a construction as a fixed association of a *signifiant* and a *signifié* (see Section 2.1), and as the syntactic and semantic features of LEX1 and LEX2 differ considerably in a systematic way, it is a necessary conclusion that we are dealing here with two different constructions, with two substantially different meanings (which receives additional support by the structural differences mentioned above, in particular, accessibility to passivization).

With reference to general principles of semantic change in grammaticalization (concrete > abstract, etc.) and empirically observed instances of change (cf. literature in 2.2.3), we assume that the construction with the meaning 'to deserve sth.' (LEX2) has emerged from the construction with the meaning 'to earn sth.' (LEX1) through host class expansion. In line with this, the novel items with ambiguous meanings (concrete / abstract) commence to appear in the schematic slot causing the collostructional shift to lexemes conceptualizing abstract semantics changing the meaning of the whole construction, cf.:

40. Jahresberichte für deutsche Geschichte, 1927, p. 583

(24) *Die einzige Gewalt, die hier noch* ***den***
The only power-F.NOM that-REL here still this-ACC name-M.ACC
Namen verdient, *ist die der Massen*
deserve-PRS.3SG be-PRS.3SG the one-NOM (of) the masses-PL.GEN
und der Regierungen. (DWDS CC20)[41]
and (of) the governments-PL.GEN
'The only power that still deserves this name is the one of the masses and of the governments.'

Relating to common knowledge concerning semantic change via metaphorical extension in grammaticalization processes, we contend that this collostructional shift is motivated by prototypical metaphorization processes, which triggered changes in the semantics of slot-fillers from concrete observed entities (e.g. *Dollar, Mark, Geld, Vermögen*) to abstract unobservable concepts (e.g. *Anerkennung, Dank, Lob*).

Considering the development from LEX2 to GRAM1, we can observe the change in the functional category of slot-fillers, i.e. from nouns in accusative case to passive infinitives, i.e. main verbs in past participle form with *zu werden*. This concerns modifications in the formal realization of co-occurring lexemes. Examining the typical items of these two constructions, it is discernible that the most representative semantic categories in both constructions represent complements conceptualizing the domains of communication and cognition. In addition, it is noticeable that numerous items in both core domains possess the same lexical base: communication (*Erwähnung, Anerkennung*$_2$ vs. *erwähnt, anerkannt*$_1$) or cognition (*Beachtung, Anerkennung*$_1$*, Achtung, Verachtung* vs. *beachtet, anerkannt*$_2$*, geachtet, verachtet*).[42] This is illustrated by the following examples, with (25) showing the noun *Erwähnung*, and example (26) the past participle *erwähnt* in a passive construction (*erwähnt (zu) werden*).

(25) *Schließlich* ***verdienen*** *noch die spezifischen Interessen*
Finally deserve-PRS.3PL also the specific interest-PL.NOM
West-Berlins eine besondere ***Erwähnung*** (DWDS CC20)[43]
(of) West-Berlin-GEN a-ACC special mention-F.ACC
'Finally, the specific interests of West-Berlin, too, deserve a special mention.'

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41. Habermas, Jürgen: Strukturwandel der Öffentlichkeit, Neuwied: Luchterhand, 1965 [1962], p. 147

42. Analogous observations concerning the change of complementation patterns from abstract verbal nouns to infinitives encoding the same verbal scene have been made with respect to the grammaticalization of *drohen* and other evidential verbs in Diewald & Smirnova (2010).

43. Kursbuch, 1966, Vol. 4

(26) *Ein Gebiet aus Fricks vielseitiger Tätigkeit*
One field-N.NOM of Frick's-GEN versatile occupation-ATT.PREP[44]
verdient *jedoch besonders* ***erwähnt*** ***zu werden***
deserve-PRS.3SG however especially mention-PST.PTCP to be-INF.AUX.PASS
'One field of Frick's versatile occupation, however, especially deserves to be mentioned.' (DWDS CC20)[45]

Consequently, we assume that the jump between two different syntactic categories representing empty slots filled by lexical elements is in part motivated by the overlapping meanings found in the item-driven collostructional behavior. This means that the change of syntactic categories representing empty slots does not proceed accidentally, but is rather motivated by internal lexeme-based properties of a construction a grammaticalizing element occurs in.

Gram1 and Gram2

The third construction (GRAM1) has an infinitival complement, which is known to be the first (visible) step towards auxiliarization (see Bolinger, 1980). The infinitival complement is in the passive: the subject of the finite verb *verdienen* is also the "psychological subject" of the passive infinitive, i.e. there is subject control. While the subject due to the passive infinitive loses its agent-hood in the situation expressed by the complement, the "others" (the speaker or (parts of) society) are up-graded to the agents of the passive infinitive complement. Due to the passive they are not on-stage, but they could be introduced by a *von*-phrase, and are cognitively implied by the passive voice. As has been shown in Section 2.2.2, the passive infinitive in complement position in modals is one of the syntactic contexts that "automatically" trigger a wide scope reading, at the same time keeping the "old" meaning. Thus, the third construction strengthens the semantic component of a social or moral evaluation being issued by a conceptualizer, who is external to the scene but able to be introduced into it. Central aspects of GRAM1 are summarized below and illustrated by a typical example in (27):

Construction Gram1
Form: verdienen (& X) & $V_{PST\ PTCP}$ + zu + werden
Meaning: 'Someone or something in the eyes of the speaker/writer should be given psychological/abstract gratification (by someone).

44. ATT-PREP stands for „prepositional attribute".

45. Der Nürnberger Prozeß, Berlin: Directmedia Publ., 1999 [1946], p. 5433

Typical example:

(27) *Im Rückblick auf das Geleistete* ***verdienen*** *zwei Tatsachen*
In retrospect of the achievements deserve-PRS.3PL two facts-PL.NOM
gewürdigt ***zu werden***. (DWDS CC20)[46]
appreciate-PST.PTCP to be-INF.AUX.PASS
'In retrospect of the achievements two facts deserve to be appreciated.'

This is very close to wide scope deontic modality constructions with verbs like *dürfen* (cf. (7) and (8) in 2.2.2). The fact that there is a passive infinitive, however, still keeps up the notion of action on the part of the conceptualizers (they have to do something); thus the conceptualizer is not yet a deontic modal source in the strict sense (i.e. the issuer of the underlying directive).

The fourth construction sheds this restriction by allowing active infinitives. Neither the subject nor conceptualizers are involved in the action. Instead the speaker/writer states that there exists a moral obligation concerning the proposition. An extended paraphrase for the core meaning of the fourth construction is: 'According to the speaker/writer there exists a weak obligation concerning the proposition, which is motivated by (some element of) the content of the proposition'. The actional component has disappeared in this construction. However, the reactive component, i.e. that there is something in the situation itself that triggers some kind of obligation, is still present. It has even been strengthened.

This reactive component can be traced back to the very component in lexical *verdienen* (see LEX1); i.e. this semantic feature persists and gets reinterpreted as "(weak) moral obligation". The reactive component in the lexical verb *verdienen* 'earn sth.' is different from the one in "old" modal verbs (preterito-presents), but, nevertheless, it is genuinely reactive insofar as it means that the subject (= the person/entity that earns something) has induced the situation expressed by the verb *verdienen* (i.e. being the (future) recipient of the "thing" earned) by some former action, without being fully in control of the completion of the transaction. This relation of 'prior instigation' is reinterpreted and abstracted in the more grammaticalized meaning of *verdienen*, and thus provides the feature [+reactive]. Its presence can be checked by substituting *verdienen* in examples like (28) below by a paraphrase using *sollten*, which has the feature [−reactive] instead of [+reactive] (*Sie* ***verdienen*** *klassisch zu werden* > *Sie* ***sollten*** *klassisch werden*). The outcome of such a substitution is devoid of the original meaning component [+reactive]: There is no pointing to some prior instigation motivating the weak moral obligation. Thus, the feature [+reactive] can be regarded as the specific distinctive feature of *verdienen* in its more grammaticalized usages as opposed to other deontic modals expressing obligation. The construction and an example are given below:

46. Völkischer Beobachter (Berliner Ausgabe), 09.03.1940

Construction Gram2:
Form: verdienen (& X) & V_{INF}
Meaning: 'Some event should happen / some state should hold due to some (moral) circumstances'
Typical example:

(28) *Es gibt Stellen darin, die klassisch* ***zu***
It-NOM exist-PRS.3SG part-PL.ACC inside-ADV.LOC that-PL.REL classic to
werden verdienen, *die in ein Lesebuch*
become-INF deserve-PRS.3PL that-PL.REL into a reader-ADV.LOC
gehören […] (DWDS CC20)[47]
belong-PRS.3PL
'It contains parts that deserve to become classic that need to go into a reader.'

Regarding the last stage of the grammaticalization path constructed, i.e. from GRAM1 to GRAM2, it is obvious that the restrictions concerning the syntactic categories of the lexical elements in complement position differ between both stages: They change from $V_{PST\ PTCP}$ + *zu* + *werden* in GRAM1 to V_{INF} in GRAM2. Despite the fact that stative verbs are the largest semantic class for the *verdienen*-construction with the meaning 'should do'[48] (GRAM2) which are not typical for the construction expressing the meaning 'should be done' (GRAM1), we could find the following coinciding semantic groups: communication, cognition, change, body, emotion, social situation. Needless to say, this study does not contain enough observations of the construction with infinitive verbal complements (GRAM2) in order to assess the semantic direction of its lexical items conclusively. GRAM2 possesses lexemes of extreme semantic variability allowing merely to state that the V_{INF}-slot is not restricted in its early stage of grammaticalization to some special types of lexemes. Accordingly, this construction should be a considerably productive construction in terms of the grammaticalization process.

6. Conclusion

Contending that synchronic variation together with known facts on grammaticalization channels can be used as evidence for ongoing grammaticalization, this paper has shown that the verb *verdienen* is used in an array of constructions that points to ongoing grammaticalization, whereby the construction of *verdienen* with infinitive

47. Auerbach, Erich: Mimesis, Bern: Francke, 1959 [1946], p. 476

48. It should be kept in mind that – obviously – the use of the verb *do* in the notation of the constructional meaning of GRAM2 does **not** imply actional semantic; *do* is used as a pro-form for any verb in the simple infinitive.

is on the way of developing into a deontic modal construction. By investigating 20th century data of *verdienen* and its complement slot we identified four relevant constructions that can be ordered in terms of a grammaticalization channel for modal constructions. LEX1 with the meaning 'earn' occurring with concrete objects and animate subjects represents a fully lexical construction. LEX2 has more abstract objects, but still lexical semantics. The step towards grammaticalization is taken when an infinitive complement with a passive infinitive is added. This is GRAM3; it shows a change of meaning towards deontic modality. GRAM 4 finally attracts active infinitives and all types of abstract subjects. Its meaning is very close to 'should'. The data allow us to conclude that the grammaticalization of *verdienen* & infinitive towards modal meaning is on its way, but has not (yet?) reached the stage of epistemic modality, i.e. a speaker-based factuality judgement.

This grammaticalization path, reconstructed from synchronic variation, is not an idiosyncratic one. Instead, it follows confirmed paths for the development of deontic modality markers. Some of the source concepts for new deontic meanings presented in earlier grammaticalization studies (in particular, *get/receive*-verbs) are similar to the source concepts and constructions we made out for lexical *verdienen*: 'getting something due to some prior action'. In the light of this evidence, we suggest that the semantic change of *verdienen* towards a deontic modality meaning re-iterates the paths of semantic change that have led to the present-day meaning of several modal verbs in the Germanic languages.

The present study has focused primarily on lexemes occurring in an open slot of the corresponding construction, which has allowed us to explain the changes during the grammaticalization of the verb *verdienen*, whereas the feature specific properties of the four constructions were not included into the empirical investigation. An investigation into these, which will help to better understand how functional changes occur on the way from lexical to grammatical constructions, and thus to complete the picture, is under way.

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Appendix

Table 3. Lexical items 1–30 of the *verdienen*-construction with the meaning 'to earn sth.'

RANK	LEX.ITEM	CORPUS.FREQ	CX.FREQ	COLL.STR
1	Geld	17243	450	5010.64
2	Brot	3834	103	1114.28
3	Lebensunterhalt	492	73	1046.40
4	Mark	16869	87	651.97
5	Sporen	406	22	267.80
6	Unterhalt	638	22	247.49
7	Dollar	5094	26	192.86
8	Pfennig	2129	20	172.57
9	Groschen	592	11	109.88
10	Taler	697	11	106.27
11	Prämie	610	9	85.71
12	Lohn	3328	11	71.98
13	Zubrot	8	4	68.63
14	Heller	77	4	48.28
15	Lebensbedürfnis	140	4	43.41
16	Taschengeld	228	4	39.47
17	Provision	286	4	37.65
18	Vermögen	3830	7	37.64
19	DM	6273	8	37.43
20	Million	17123	11	37.20
21	Franken	2217	6	36.87
22	Sou	62	3	35.77
23	Cash	7	2	31.48
24	Heidengeld	12	2	29.04
25	Summe	4557	6	28.44
26	Franc	938	4	28.17
27	Goldmark	218	3	28.14
28	Schilling	947	4	28.09
29	Mk	1057	4	27.22
30	Westgeld	27	2	25.60

Table 4. Lexical items 1–30 of the *verdienen*-construction with the meaning 'to deserve sth.'

RANK	LEX.ITEM	CORPUS.FREQ	CX.FREQ	COLL.STR
1	Beachtung	2009	347	4750.39
2	Erwähnung	813	116	1524.76
3	Name	26383	140	903.97
4	Vorzug	2230	58	556.25
5	Aufmerksamkeit	5131	65	529.64
6	Anerkennung	5268	60	475.99
7	Dank	3463	46	378.74
8	Lob	1316	38	372.08
9	Interesse	26010	66	328.19
10	Vertrauen	6080	41	282.08
11	Achtung	2715	28	216.11
12	Hervorhebung	289	18	204.30
13	Bezeichnung	5252	28	179.43
14	Bewunderung	1117	20	176.37
15	Strafe	4038	24	158.91
16	Respekt	1153	12	92.74
17	Tod	17909	24	89.54
18	Nachahmung	961	11	87.10
19	Glauben	6385	17	85.71
20	Verbreitung	2469	12	74.61
21	Behandlung	7363	16	74.37
22	Ehrentitel	171	7	73.39
23	Mitleid	1415	10	69.57
24	Würdigung	878	9	69.27
25	Verachtung	991	9	67.10
26	Untersuchung	11451	16	60.89
27	Ehrenname	61	5	59.56
28	Beiname	250	6	56.41
29	Beifall	3345	10	52.64
30	Schonung	455	6	49.19

Table 5. Lexical items 1–30 of the *verdienen*-construction with the meaning 'should be done'

RANK	LEX.ITEM	CORPUS.FREQ	CX.FREQ	COLL.STR
1	hervorgehoben	1588	63	577.74
2	genannt	8729	43	213.02
3	erwähnt	4054	19	91.02
4	festgehalten	1534	14	85.14
5	bemerkt	2752	15	76.09
6	angemerkt	116	7	69.03
7	gewürdigt	753	8	50.92

RANK	LEX.ITEM	CORPUS.FREQ	CX.FREQ	COLL.STR
8	beachtet	1313	9	49.54
9	entrissen	339	6	44.25
10	gehängt	388	4	25.18
11	angereiht	18	2	22.24
12	vermerkt	716	4	20.37
13	gelobt	353	3	17.73
14	abgemeiert	2	1	14.62
15	gebrandmarkt	136	2	13.99
16	gelesen	3289	5	13.23
17	aufgeknüpft	14	1	10.19
18	verachtet	361	2	10.14
19	eingesperrt	364	2	10.11
20	angebaut	420	2	9.55
21	angespuckt	21	1	9.36
22	anerkannt	3410	4	8.76
23	umgeschrieben	29	1	8.70
24	aufgenommen	1710	3	8.70
25	registriert	533	2	8.64
26	totgeschossen	31	1	8.57
27	geachtet	566	2	8.41
28	auseinandergenommen	34	1	8.38
29	betrachtet	1817	3	8.37
30	angebetet	42	1	7.96

Table 6. Lexical items 1–14 of the *verdienen*-construction with the meaning 'should do'*

RANK	LEX.ITEM	CORPUS.FREQ	CX.FREQ	COLL.STR
1	heißen	1925	8	67.19
2	leben	6094	4	18.76
3	einnehmen	1642	2	11.72
4	fortleben	73	1	10.66
5	eingehen	2724	2	9.75
6	sein	114325	9	9.16
7	tragen	7188	2	6.08
8	füllen	777	1	5.95
9	kommen	20206	3	5.84
10	wohnen	1233	1	5.05
11	genießen	1325	1	4.91
12	laufen	1793	1	4.33
13	beschäftigen	1835	1	4.28
14	sterben	2210	1	3.93

* This table contains only significant attracted verbal lexemes.

The diachrony of Galician *certamente* and *seguramente*

A case of grammatical constructionalization

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This paper addresses the evolution of two Galician adverbs, *certamente* and *seguramente*. Data from three different periods show that they had similar manner, modal and discourse functions in the Middle Ages, as opposed to their distinct functional profiles in more recent days. The theoretical analysis is based on Traugott and Trousdale's (2013) framework, and shows that several instances of grammatical constructionalization occurred since the emergence of *-mente* adverbs out of a Latin instrumental construction until the appearance of (inter) subjective markers. The current study also reveals that *certamente* has become a strengthener and, to a lesser extent, a certainty marker, whereas *seguramente* expresses probability. The semantic evolution of the adverbs, from manner, through strengthening, to epistemic modality, is in contradiction with the unidirectionality of (inter)subjectification, whereas the loss of intersubjective functions in *seguramente* is a case of deintersubjectification. Previous research shows that this is a recurrent pattern for epistemic and evidential expressions.

1. Introduction

In present-day Galician, *certamente* and *seguramente* are two adverbs with a divergent functional profile. *Certamente* expresses certainty and strengthening, similarly to English *certainly* (Byloo, Kastein, & Nuyts, 2007; Simon-Vandenbergen & Aijmer, 2007), whereas *seguramente* encodes an epistemic value of (high) probability (Míguez, 2019). (1) offers typical occurrences of these adverbs in present-day prose (hereafter all translations are mine, unless stated otherwise).

(1) a. *O meu sangue* ***certamente*** *era azul, pero con eso non abondaba neste tempo.*
'My blood was certainly blue, but that was not enough in these times.'
(1985, CERTNARR0099, CORGA)

https://doi.org/10.1075/cal.32.05mig

b. *Baixo a mesa do altar descubríase case agochada unha ara romana.* ***Seguramente*** *era unha pedra votiva, máis pagá imposible.*
'Under the table of the altar one could see a Roman ara, almost hidden. It most probably was a votive stone, it could not be more pagan.'
(2011, SEGUNARR1088, CORGA)

(1) features sentential uses of the two adverbs that have scope over a whole predication. In (1a) *certamente* reinforces the content of the first clause. In (1b) *seguramente* qualifies the explanation given by the writer in terms of likelihood. However, these formal and functional patterns differ, some times notably, from the semantic and syntactic features these adverbs had in earlier periods of the language.

There has been some interest in the diachrony of modal and discourse adverbs at least since Traugott (1989). Particular expressions such as English *maybe* (López-Couso & Méndez-Naya, 2016) and *perhaps* (Suzuki, 2018), Galician/Spanish *se cadra*/*si cuadra* (Rodríguez-Espiñeira, 2019), Spanish *tal vez* (Cornillie, 2016), or Romance *-mente* adverbs (e.g. Hummel, 2018; Suárez Hernández, 2018) have received historical-linguistic accounts in recent times. However, most Galician epistemic expressions remain unaccounted for in terms of diachrony. The syntactic and semantic development of Galician *certamente* and *seguramente* will be the focus of the present paper.

From a theoretical standpoint, the development of modal and discourse adverbs is usually explained in terms of *(inter)subjectification* (e.g. Traugott & Dasher, 2002) and *grammaticalization* (e.g. Hopper & Traugott, 2003). Work within this framework considers that adverbs gain syntactic freedom and increase their structural scope while their meaning becomes more (inter)subjective. Downing (2008) and Traugott (2014) argue that this is the case of English *surely*, which, according to them, developed from a manner adverb, through an epistemic marker, to a discourse particle.

(Inter)subjectification is one of the most influential hypotheses in semantic change. It claims that meanings evolve from the description of the world, to the expression of speakers' attitudes and, finally, the speaker's stance toward the hearer, as reflected in (2).

(2) non-subjective > subjective > intersubjective
(Traugott & Dasher, 2002, p. 281)

An important assumption, present in Traugott's work (e.g. Traugott, 2003, 2007; Traugott & Dasher, 2002), is the unidirectionality of (inter)subjectification: meanings change in the direction of increased (inter)subjectivity, but not the other way around. In other words, (2) cannot be run through from right to left – there is no de(inter)subjectification. Nevertheless, some counterexamples to this hypothesis

have been spotted in different domains of grammar (López-Couso, 2010, pp. 142–143), the most prominent collection of which is found in the realm of epistemic and evidential expressions, particularly in the work of Cornillie (2008, 2016). This author shows that the development of expressions such as the Spanish evidential (semi-)auxiliaries *resultar* and *parecer*, the epistemic adverbs *tal vez* and *quizás*, and even some of Traugott and Dasher's (2002) own applications of the notion to modality contradict the unidirectionality principle, insofar as they instantiate cases in which modal expressions develop intersubjective readings before subjective ones.

Grammaticalization is the development of a (more) grammatical status, typically out of a fully-lexical item. This morphosyntactic development entails a semantic shift from contentful to procedural meaning, i.e. "abstract meaning that signals linguistic relations, perspectives and deictic orientation" (Traugott & Trousdale, 2013, p. 12). Thus, grammaticalization intersects with (inter)subjectification: (inter) subjective meanings are procedural, as they are concerned with the interlocutors' perspective, and usually originate from non-subjective, contentful ones.

Another key notion in understanding the development of new forms and meanings is that of ambiguous contexts. These are *critical* contexts "characterized by multiple structural and semantic ambiguities and thus invite[s] several alternative interpretations" (Diewald, 2002, p. 103), the new ones being invited inferences which may lead to the conventionalization of a new meaning (Traugott & Dasher, 2002). *Isolating* contexts, "i.e. specific linguistic contexts that favor one reading to the exclusion of the other" (Diewald, 2002, p. 103), are a further step which favors the separation of the old meaning from the new one.

Traugott and Trousdale (2013) adapt (some of) the previous ideas into a constructional framework where linguistic changes are understood as a set of alterations in a network of constructions. These alterations may either affect some dimension of an existing construction (constructional change) or lead to the emergence of a new combination of form and meaning, i.e. a new node in the constructional network (constructionalization).[1] Traugott and Trousdale (2013) further distinguish between the constructionalization of items with procedural and contentful meanings. The current study aims at showing that the diachronic trajectories of *certamente* and *seguramente* involve the development of procedural meaning, and are, therefore, instances of grammatical constructionalization.

1. Note that this characterization of constructionalization differs from Traugott and Trousdale's "creation of a $form_{new}$-$meaning_{new}$ pairing" (2013, p. 22). It is not the newness of both the formal and the functional side that leads to a new sign, but the newness of the connection between the two sides – see Diewald et al. (this volume) for further discussion.

Although a semantic evolution in terms of (inter)subjectification is logically possible, the most likely diachronic path is one where the emergence of the subjective epistemic meaning of certainty followed the development of an intersubjective strengthening meaning, which, in turn, evolved out of non-subjective manner uses. Structural and functional ambiguities between manner and strengthening uses, on the one hand, and between strengthening and epistemic uses, on the other, are central to this consideration. Thus, I will claim that the evolution of *certamente* and *seguramente* contradicts the unidirectionality from subjective to intersubjective meanings. Furthermore, the loss of the intersubjective uses of *seguramente* in favor of an epistemic meaning of probability represents a case of deintersubjectification or loss of intersubjective functions.[2]

The paper is structured as follows. Section 2 explains the data and method used in the corpus study, the results of which are presented in Section 3 together with a description of the diachronic trajectory of *certamente* and *seguramente*. Section 4 accounts for the results in terms of constructionalizations and constructional changes. Section 5 sums up and discusses the main findings.

2. Data and analytical categories

Relying on linguistic data from previous ages usually means trusting written language, which is typically associated with communicative distance. Historical pragmatics prefers the language of immediacy, that is, language that can be considered as close as possible to spontaneous spoken discourse (Taavitsainen & Jucker, 2010, pp. 7–10). The scarcity of data of this kind should not pose a problem for the study of *-mente* adverbs, since these items are associated with literary written language, which, in turn, is characterized by communicative distance (Company Company, 2012). The main problem for the historical study of *-mente* in Galician is its low frequency in old texts, and the lack of data for the 16th, 17th and 18th centuries.

The socio-political status of a language (or, rather, its speakers) directly determines to what extent that language is used in writing and, consequently, for most of history, how much linguistic data from a particular language stage will reach the future. In the case of the Galician language, this means that we have good sources for the medieval period, when Galician enjoyed the status of literary language in

2. A reviewer points out that "subjectification from an intersubjective reading" might be a more adequate wording. This is unfortunate, though, since intersubjective meaning is already subjective, as "there cannot be intersubjectification without some degree of subjectification because it is SP/W [the speaker/writer] who designs the utterance and who recruits the meaning for social deictic purposes" (Traugott & Dasher, 2002, p. 31).

western Iberia and was the main written and spoken language in Galicia. After the year 1500, however, almost three centuries followed in which the written form of the language was almost completely abandoned. This was a consequence of socio-political changes that took place at the end of the 15th century, namely the loss of power by Galician elites and the implementation of centralist policies by the Crown of Castile. Thus, very little first-hand evidence remains on Modern Galician in its early stages – for an overview of the history of Galician see Mariño Paz (2008) and Monteagudo (1999).

Due to (the) data (frequency) limitations, the current study is centered around three chronological periods: medieval (1200–1460), early contemporary (1880–1930), and present-day (1975–2014). Alongside these specific time frames, I will use the more general labels "Old Galician" and "Modern Galician" to refer to the language before and after the year 1500, respectively. Data were obtained from three electronic corpora: the *Tesouro Medieval Informatizado da Lingua Galega* (TMILG) for medieval data, the *Tesouro Informatizado da Lingua Galega* (TILG) for early contemporary data, and the *Corpus de Referencia do Galego Actual* (CORGA) for present-day data. Samples of up to 100 occurrences per adverb and period were taken. However, the scarcity of the medieval data made it impossible to reach, even approach, this figure – only 11 cases of *certamente* and 23 of *seguramente* were found in this period.

Since this study focuses on the development of (inter)subjective functions, occurrences of the adverbs within an adjective phrase were excluded. This is relevant in the case of *certamente*, which in this context has evolved toward an intensifier (e.g. *certamente bo* 'really good'). González Manzano (2010, 2013) discusses the development of this function in Spanish *ciertamente, realmente*, and *verdaderamente*. She shows that uses of this type first appeared during the 15th and 16th centuries, and relates its emergence to the grammaticalization of the intersubjective functions of the adverbs. It is therefore safe to assume that the intensifier function in the adjectival domain did not play a role in the development of the older manner and post-manner functions of the adverbs.

The analysis consists of a classification of every instance of an adverb into one or more functional categories. Following Byloo et al. (2007), categories have been established through observation of the data, i.e. finding differences and similarities between occurrences. Three main meanings or uses are identified in the evolution of the two Galician adverbs under investigation: a non-subjective meaning of manner, a subjective meaning of epistemic modality, and an intersubjective strengthening meaning. In addition, an intersubjective "pragmatic" meaning was detected in *seguramente* – I will use the label 'postmanner' to refer to the (inter)subjective uses of the adverbs. The remainder of this section offers an explanation and illustrations of the analytical categories used in the corpus study.

2.1 Manner uses

The notion of manner does not denote, stricto sensu, a particular meaning but rather a functional slot in the verbal periphery. The arguments for keeping the several meanings within manner under the same category respond to the facts that (i) there are not many instances of manner uses throughout the data (28 in total, see Section 3), and (ii) they do not differ greatly (they are usually related through metonymy).

Certamente as a manner adverb occurs alongside verbs of locution, such as *rresponder* 'answer, reply' and *dizer* 'say, tell', and cognitive verbs like *creer* 'believe' and *saber* 'know', (3). Both with verbs of locution and verbs of cognition, the meaning of the adverb lies in the realm of truthfulness, coding that what is said or known converges with what is (considered to be) true.

(3) a. *Ca doutra maneyra nõ poderia* ***certamente*** *rresponder el demãdado nẽ o juiz dar sua sentenza.*
'Since otherwise the defendant could not answer truthfully nor could the judge issue his sentence.' (1326–1375, TPc II 26/38, TMILG)

b. *Pois que tu est'oyd'ás, e creo* ***certãamente*** *que con eles jantarás, rogo-t'eu que vaa tigo comer de tan bon manjar.*
'Since you have heard this, and I truly believe that you will share the midday meal with them, I ask to go with you and eat such delicacy.'
(1264–1284, CSM II, TMILG)

c. *Et esto toveron que era dereyto por duas rrazões. A primeyra porque quando soubessen* ***certamente*** *a rrazõ porque e sua …*
'And they found that this was right for two reasons. First, because when they knew for sure the reason why is his …'
(1325–1374, TPc II 25/38, TMILG)

Seguramente seems to be more polysemous in its manner uses. With motion verbs (like *andar* 'walk', *chegarse* 'approach', *sair* 'exit', *viir* 'come'), and action verbs in general (like *comer* 'eat', *laurar* 'work') it means 'safely', 'confidently', or 'steadfastly', (4). With verbs of locution, *seguramente* also expressed meanings of safety and confidence, as in (5a), which in some contexts coexisted with meanings of truthfulness, like those typical of *certamente*, as in (5b).[3]

(4) a. *Et mandoos que laurassem et criassem* ***seguramente*** *et que llj dessem seu peyto, segũdo que o dauã a seu rrey.*
'And he ordered them to work and breed steadfastly and to pay him a tax, as they did with their king.' (1295–1312, TC 346/512, TMILG)

3. Similar semantic patterns were detected for Spanish *seguramente* (Villar Díaz, 2016, pp. 376–378) and English *surely* (Traugott, 2014, p. 79).

b. … *non ousades de andar* ***seguramente*** *por la terra donde sodes natural …*
'… you do not dare walk safely in the land where you were born …'
(1434, MNP 110/150, TMILG)

c. … *que os mercadores e vesiños de Santiago e do arçobispado non ousauan viir a esta çibdade* ***seguramente*** *con suas mercadorías …*
'… that the merchants and neighbors of Santiago and the archbishopric did not dare come safely to this city with their merchandise …'
(1446, VFD 177/82, TMILG)

(5) a. *Et sabede que en aquel tẽpo era costume que todo messageyro andasse en saluo per huquer, et que* ***segurament*** *cõtasse seu messagẽ, et nũca por ende mal rreçebessen.*
'And be it known unto you that at that time it was customary for a messenger to walk anywhere safely, and that he told his message safely, and that no harm was done to him because of that.'
(1370–1373, CT 20/236, TMILG)

b. … *disso hũ sabio que ouo nome Tulio, que en nehũa cousa nõ pode homẽ auer amĩgo a qũe podesse dizer* ***seguramente*** *sua uoentade, assi coñmo a ssi meesmo;*
'… a wise man named Tullius said that no one in any respect may have a friend to whom he can safely/truthfully tell his will, as he does to himself.'
(1300–1350, CPa XXVII, 4/126, TMILG)

In early contemporary and present-day language, manner uses of *certamente* are restricted to combinations with *saber*, like (6a). In the early contemporary sample *seguramente* features one manner use with the verb *encamiñar* 'direct, guide'. It is coordinated with another *-mente* adverb, and means 'safely' or 'steadfastly', see (6b). No manner use is attested for *seguramente* in the present-day sample.

(6) a. *Cantas veces paso, cantas me paro a revisar tódalas pedras que me parecen de interese, por se algunha puidera pertencer a estes pazos, que non sabemos* ***certamente*** *ónde estaban.*
'How many times do I pass by, how many times do I stop to check all the rocks that I find interesting, in case any of them could belong to these manor houses, which we do not know for sure where they were.'
(2002, CERTXORN0146, CORGA)

b. … *de vós pende encamiñar dereita- e* ***seguramente*** *as cousas pra o pro comunal;*
'… it is up to you to steer things directly and securely toward the common good.' (1895, SEGUTILG0028, TILG)

2.2 Epistemic uses

Epistemic modality is an estimation of the degree of likelihood that an event takes/has taken/will take place, as made by the speaker (Nuyts, 2001). The epistemic use of *certamente* corresponds to the expression of certainty (i.e. 100% likelihood) in all periods, as seen in (7).

(7) a. *Et o prior foy muy aqueixado conos mouros et viose en muy gran coyta, ca* ***certamẽte*** *ouuerano morto ou leuado, senõ fora por esses que cõ el seyrã …*
'And the prior was really bothered by the Moors and found himself in such a big trouble, that he would certainly have been killed or captured, if it were not for those who had gone out with him …'
(1295–1312, TC 600/864, TMILG)

b. *A influencia que dito ensino técnico moderno terá na Galicia será enorme.* ***Certamente*** *trairá consigo unha época d'actividade industrial, é dicir, da que sexa de todo adatada ao noso país.*
'The influence that the said modern technical training will have in Galicia will be huge. It will certainly bring an era of industrial activity, that is to say, one that is totally adapted to our country.' (1930, CERTTILG0170, TILG)

c. *Pois tampouco pagaba a pena vivir se tiña de facelo en permanente anguria. Diante de todo contaba a súa tranquilidade. E* ***certamente*** *un crime non sería o que mellor lla aportaría.*
'Living was not worth it if it had to be done in permanent anguish. His peace of mind was first. And a crime would certainly not be the best thing to give him it.' (1991, CERTNARR0173, CORGA)

In the medieval period, the epistemic use of *seguramente* also entailed certainty, as in (8).

(8) *e quando foi na cidade, peor enferma moller non vistes do que foi ela; ca pero de Monpisler bõos fisicos y eran, dizian: "Non viverá." E por que esto que dizian non era mui sen razon, ca d'aver ela seu fillo estava ena sazon; e avia tan gran fever, que quena viya enton dizia: "****Seguramente****, desta non escapará".*
'and when she was in the city, she was sicker than anyone you have ever seen; even though there were good physicians from Montpellier, they said: "She will not live." And they said so not without reason, because she was about to have her child; and she had such a big fever, that those who saw her at that moment said: "Surely, she will not get out of this"'. (1264–1284, CSM 256/26, TMILG)

In present-day language the epistemic value of *seguramente* is that of (high) probability, as already seen in (1b). Early contemporary examples represent a middle ground, since the adverb could express both certainty and (high) probability, see (9).[4]

4. A detailed analysis of the epistemic uses of *seguramente* can be found in Míguez (2019).

(9) a. *Dios lle conserve a vida ó siñor Pondal e lle dea saúde pra que, canto antes, poidamos saborear súas novas produciós, que* ***seguramente*** *serán unha notabre adquisición prá literatura rexional.*
'May God preserve the life of mister Pondal and give him health so that, as soon as possible, we can relish his new works, which will surely/?most probably be a remarkable acquisition for the regional literature.'
(1886, SEGUTILG0001, TILG)

b. *Dáme o corpo que quen fixo tal escamoteo é,* ***seguramente****, partidario de qu'as imaxes se arromben nin máis nin menos, que asegún foron.*
'I have a feeling that the person who did this legerdemain is surely/most probably in favor of arranging the statues nothing less than as they were.'
(1886, SEGUTILG0011, TILG)

2.3 The strengthening use

Byloo et al. (2007) and Simon-Vandenbergen and Aijmer (2007) distinguish between epistemic and strengthening uses – Simon-Vandenbergen and Aijmer use *emphasis* to refer to the latter. Historical studies tend not to differentiate them and consider them part of a single epistemic function – or, at best, regard the strengthening use as a nuance of the epistemic use. However, the uses are neatly different and their diachronic relation raises interesting implications for common assumptions regarding semantic change.

In the strengthening use, the adverbs reinforce the assertion they occur in. This assertion may be some kind of assessment or a statement, understood as a 'neutral' description of facts. The need to reinforce an assertion has to do with the speaker's rhetorical purposes, such as showing agreement with the interlocutor or a third party. In (10a) and (10c) *certamente* strengthens a statement. In (10b) the same adverb reinforces the first clause, which contains a quality judgment and is followed by a *but*-clause.

(10) a. *E el se foi* ***certamente****, por que de pran non podia na terra guarir un dia;*
'And he certainly left, because he really could not be at peace in his homeland one more day.' (1240–1300, LP II 001/664, TMILG)

b. ***Certamente*** *os románticos son exaltados, mais os crásicos poden sé-lo tamén.*
'Certainly, the Romantics are impassioned, but the Classics can also be.'
(1922, CERTTILG0119, TILG)

c. *Unha loba! A tarefa non era doada, máis ben era imposible.* ***Certamente****, as lobas, para parir e sacar adiante os seus lobetos, afástanse dos seus conxéneres, co que o fillo do ferreiro non tería que enfrontarse a toda unha manda.*
'A she-wolf! The task was not easy, it was rather impossible. Indeed, she-wolves get away from their fellow wolves to carry forward their pups, so the blacksmith's son wouldn't have to deal with a whole pack of wolves.'
(2008, CERTNARR0704, CORGA)

Seguramente could also strengthen assertions. This is the case of the medieval example and the early contemporary one in (11). In the present-day sample, the strengthening use was not found.

(11) a. *Et cõ todo esto era tã ben feyto ẽno corpo et ẽno rrostro que nõ achariades nehũ tãto, et* ***segurament****, cõmo diz Dayres, ben pareçía caualleyro estando en praça.*
'And with all this he had such a well-made body and face that you would not find another like him, and, surely, as Dares says, he really looked like a knight standing in the battlefield.' (1372–1373, CT 75/274, TMILG)

b. *Si alguén o negase, sobra sólo algunhas follas da hestórea contemporánea e cheas de lama e sangue atoparáias,* ***seguramente****;*
'If someone denied it, there would be only a few superfluous pages of contemporary history, and (s)he would find them full of mud and blood, surely.' (1917, SEGUTILG0049, TILG)

2.4 The pragmatic use

Pragmatic uses refer to cases where the adverb, instead of modifying the semantics of (some part of) the utterance, changes the nature of the speech act. Byloo et al. (2007) identified these uses in the case of Dutch *zeker*, particularly when the adverb is used to turn a declarative sentence into a special kind of interrogative – what they call a "declarogative." This mechanism, comparable to a tag question, is used by speakers to ask for confirmation of their claims. English *surely* is used in the same way in what Simon-Vandenbergen and Aijmer (2007, p. 136) term "the opening-up function, reaching out to the addressee for confirmation." (12) offers some of their examples.

(12) a. *Hij zal wel weten wat ie kan* ***zeker****?*
'He'll know what he can do, won't he?'
(Byloo et al., 2007, p. 52, their translation)

b. Of course the chaos when the Supreme Being was discovered tied up and concussed on the floor would be indescribable, but *surely* they would need to be more than just lucky to win much more time out of mere chaos?
(Simon-Vandenbergen & Aijmer, 2007, p. 136)

These interrogatives retain declarative syntax, as Byloo et al. (2007) point out, which is a clear indication that they cannot be considered true questions. The adverb does not function in this context as an epistemic or strengthening device, but as a signal of this particular kind of speech act. The only instance of this use in the data of the current study corresponds to *seguramente* in the early contemporary period.

(13) *Mar.: – ¿Xa pensas botarlle o lazo? Mer.: – Como poida atrapá-lo… Non é fácil atopar un bon partido non saíndo d'aquí, de sorte que se algún aparece por casualidá, hai que tratar de cazá-lo… Inda que teña que correr atrás del, como cando andamos perseguindo as bolboretas. Mar.: – ¿E* ***seguramente*** *irá hoxe ao baile do Casino? Mer.: – Por eso vou eu. Mar.: – Daquela é mellor para o éisito dos teus proieitos que m'eu quede na casa (rindo).*
'Mar.: – Are you already thinking of snaring him? Mer.: – If I could catch him… It isn't easy to find a good catch without getting out of here, so if someone appears by chance, one must try to catch him… Even if you have to run after him, like when we chase butterflies. Mar.: – And surely he will go today to the ball at the Casino? Mer.: – That's why I'm going. Mar.: – Then it will be best for the success of your plan that I stay at home [laughing].'
(1920, CERTTILG0076, TILG)

In (13) Mar. seeks confirmation of a fact that she assumes to be the case, and introduces *seguramente* in her apparently interrogative sentence. It is significant that Mer.'s reply does not answer the question but elaborates on the topic, thus treating Mar.'s question as a declarative clause.

2.5 A note on syntax

From a formal point of view, manner uses occur near the verb, usually immediately before or after it, although intervening material is inserted between them in some cases – witness (4c), where the second argument of *viir, a esta cidade*, appears between the verb and the adverb. Manner adverbs are complements of the verb and occur within the verb phrase: they have *phrasal syntax*.

In contrast, epistemic, strengthening, and pragmatic uses occur either in initial, medial, or final position in the utterance. They are prosodically independent, as evidenced by the use of commas in examples such as (9b), (10c), and (11b). The amount and type of intervening material that can occur between the adverbs in their post-manner uses and the main verb of the clause is less restricted than in the case of manner uses: for instance, *certamente* and the verb form *afástanse* in (10c) are separated not just by the verb phrase-external argument of the verb – the subject *as lobas* – but also by the final adjunct headed by *para*. Post-manner adverbs do not complement the verb but scope over the whole sentence, whence their greater positional freedom: they have *sentential syntax*.

2.6 Ambiguities

Sometimes it was not possible to assign a single value to a particular occurrence of an adverb. In such cases, all the values observed were counted – in practice, there was no instance in which more than two values were registered. Six different two-value combinations are logically possible, but only two were found. First, the uses may be ambiguous between a manner and a strengthening meaning. This is the case of two occurrences of *certamente* together with the verb *saber* in early contemporary texts. An example can be found in (14).

(14) *Ademais, como non se sabe* ***certamente*** *nada de nada en custión de esta clas, nin il ha recibir dato certo, nin podrá, polo mesmo, diutar medida xusta.*
'Besides, since nothing is known for sure/nothing is certainly known about this matter, neither will he get truthful information, nor will he be able, for the same reason, to issue just measures.' (1919, CERTTILG0098, TILG)

In present-day Galician manner adverbs must appear right after the verb – the preverbal position is regarded as archaic. *Certamente* in (14) is ambiguous between a manner and a strengthening use in part because it occurs in this position. In Old Galician manner adverbs enjoyed more syntactic freedom, since they also appeared preceding the verb, as seen in examples (3a) and (5a) above. In (15) *certamente* and *seguramente* precede the verb and are ambiguous between a manner reading (modifying the speech verbs *dizer* and *demandar* 'ask') and a strengthening reading.

(15) a. *Mai-lo Papa Cremente* ***certamente*** *lle disse: "Essa ora, sen demora, te vai pera Suria … "*
'And Pope Clement truthfully/indeed told him: "Right now, without delay, you go to Syria …"' (1264–1284, CSM 115/427, TMILG)

b. *Ben pode* ***seguramente*** *demanda-lo que quiser aa Virgen tod'aquele que en ela ben crever.*
'Anyone who really believes in the Virgin can surely/safely ask her what they want.' (1264–1284, CSM II 271/61, TMILG)

The second kind of ambiguity is between a strengthening and an epistemic use. This ambiguity is very common in early contemporary and present-day *certamente* but is also observed in medieval and early contemporary *seguramente*.

(16) a. *As leis qu'agariman ós obreiros non rezan prós nosos campesiños, i é* ***certamente*** *por non teren apricaceón.*
'The laws that safeguard workers do not pray for our peasants, and that is certainly because they are not enforced.' (1917, CERTTILG0079, TILG)

b. *Vedes, fremosa mia senhor,* ***segurament(e)*** *o que farei: Entanto com'eu vivo for, nunca vus mia coita direi; ca non m'avedes a creer, macar me vejades morrer.*
'See, my beautiful lady, what I will surely do: as long as I am alive, I will never tell you my grief; since you would not believe me, even if you saw me die.' (1220–1240, LP I 031/327, TMILG)

c. *– Eu coido coma ti qu'isto non pode siguir moito tempo. – E non siguirá* ***seguramente****, se deixando de unha vès pra sempre d'alaiar e xemer nos resolvemos a berrar todos a unha*
'– I think, just like you, that this cannot go on like this much longer.
– And it surely won't if we stop complaining once and for all and decide to shout all together.' (1917, SEGUTILG00050, TILG)

In examples like (16) *certamente* and *seguramente* can be read either as reinforcing the opinion of the speaker or as estimating as 100% likely that what he thinks is or would be the case.

At this point, we must also mention absolute uses, i.e. the adverb stands alone in an utterance, as a reaction to the previous context (Nuyts, 2001, pp. 89–91). These uses are relevant as an index of entrenchment of inter-subjective functions, but, since they are typically oral and we are dealing with written data, not many of them are to be expected. We do find some in early contemporary and present-day data, corresponding to strengthening uses. Significantly, the excerpts are dialogues found in the narrative genre, (17).[5]

(17) a. *O que é ata agora, máis ben somos nós os que bailamos ó son da súa música. ¿Non che parece? –* ***Certamente****.*
'As for now, it is us who dance to their music, don't you think? – Certainly.' (1917, SEGUTILG0049, TILG)

b. *– Agardalle, sen dúbida, un grorioso porvir. – ¿Como o de vostede? – Ou poida que mellor. Serán vostedes felices.*
– ¿Éo vostede? A afouteza da inquisición estranou a Ramiro. – ***Seguramente*** *– afirmou.*
'A great future is, no doubt, awaiting you. – Like yours? – Or maybe better. You will be happy. – Are you? – the audacity of the inquiry surprised Ramiro. – Surely – he affirmed.' (1927, SEGUTILG0121, TILG)

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5. Absolute uses are also taken to signal an advanced stage of development in cases where formal fusion is at stake, such as that of *like*-parentheticals, e.g. the use of *looks like* as an epistemic/evidential expression (López-Couso & Méndez-Naya, 2014). Since the formal unity of the suffix *-mente* and its adjectival base was already well established in the medieval period (Hummel, 2013a, pp. 20–21), absolute uses are not very relevant in this connection.

In their absolute uses, *certamente* and *seguramente* strengthen the assessment present in the previous utterance – the opinion of the interlocutor in (17a), the statement of well-being implicit in the question in (17b) – but in some cases they can also be taken to express an epistemic qualification – thus, (17a) is ambiguous between the strengthening reading and an epistemic reading (i.e. 'it is 100% likely that what you said is true').

3. Corpus findings

This section presents the results of the corpus study together with a discussion of the data. The presence of ambiguous instances requires the use of a minimal and a maximal count (see Byloo et al., 2007). The minimal count includes only unambiguous instances, whereas the maximal count includes all occurrences. As a consequence of this, when there are ambiguous instances in a sample, neither the minimal nor the maximal count add up to the total number of examples in the sample. The tables below display the data for each adverb separately, except for the medieval period, where a sum of both is also provided. This is due to the scarcity of medieval data and the similarity of both adverbs in that period. All tables include the number of ambiguous cases. For early contemporary and present-day language, whose samples amount to 100 cases, absolute and percentual values are equivalent. In the case of medieval data, they are provided in different tables.

Table 1 shows the absolute values for the minimal and maximal counts of *certamente, seguramente* and their sum in the medieval period. Table 2 presents the relative values for the same data.

Table 1. Absolute frequencies of the different uses of *certamente* and *seguramente* in medieval language

	Certamente ***n* = 11** **min (max)**	***Seguramente*** ***n* = 23** **min (max)**	**Sum** ***n* = 34** **min (max)**
manner	7 (8)	11 (13)	18 (21)
epistemic	2 (2)	2 (6)	4 (8)
strengthening	1 (2)	4 (10)	5 (12)
pragmatic	0 (0)	0 (0)	0 (0)
ambiguity	1	6	7

Table 2. Share of the different uses of *certamente* and *seguramente* in medieval language

	Certamente *n* = 11 min (max)	*Seguramente* *n* = 23 min (max)	Sum *n* = 34 min (max)
manner	63.64 (72.73)	47.83 (56.52)	52.94 (61.76)
epistemic	18.18 (18.18)	08.70 (26.09)	11.76 (23.53)
strengthening	09.09 (18.18)	17.39 (43.48)	14.71 (35.29)
pragmatic	00.00 (00.00)	00.00 (00.00)	00.00 (00.00)
ambiguity	09.09	26.00	20.59

In the medieval data only 11 occurrences of *certamente*, and 23 of *seguramente* were found. Such a low number of occurrences may be considered not enough to draw sound conclusions about the characteristics of the adverbs in Old Galician. Nevertheless, a cautious analysis of the sum of the results for both adverbs reveals some interesting patterns.

Manner is, by far, the most frequent use in both counts. Strengthening comes second and epistemic modality is last. There are few cases of ambiguous manner, as opposed to half of epistemic and more than half of strengthening uses. The prevalence of manner (in terms of frequency and non-ambiguity) is in accordance with the idea that this is the oldest use of the adverbs. The high ambiguity levels of the other uses may be taken to signal their lack of (complete) conventionalization and, thus, their novelty. In the case of strengthening, these levels are certainly also related to its participation in both types of ambiguities (manner/strengthening, strengthening/epistemic).

Other relevant information comes out when we take a closer approach to the particular text types *certamente* and *seguramente* appeared in. There were three main written genres in Old Galician: administrative prose, non-administrative prose (which included literary, historical, religious, technical, and juridical texts), and poetry. Administrative prose accounts for almost 80% of the preserved corpus. Nevertheless, almost half of *-mente* adverbs in TMILG are found in non-administrative prose, particularly in literary prose.[6] These numbers match the common view that *-mente* adverbs found their niche in high literary registers.[7]

6. For this estimation, I have analyzed the distribution by text type of all *-mente* adverbs starting with either *a, b, c*, or *d* in TMILG.

7. A special feature in the evolution of *-mente* adverbs is that they are an innovation of higher registers, contrary to the widely held assumption that linguistic innovations pop up in colloquial language and only then do they reach formal texts. In fact, the relation of *-mente* with formal speech dates back to the early days of the construction in Latin high-level poetry (Bauer, 2010, p. 340).

In administrative texts, only *seguramente* is documented and works as a manner adjunct meaning 'safely, with confidence', usually with motion verbs, as illustrated by the examples (4b) and (4c) above. This is expectable, since administrative prose is a genre, usually related to declarative speech acts, with no room for (inter)subjective meanings. That is why only manner (i.e. non-subjective) uses are found in such texts.

This is not the case, though, of non-administrative prose, where facts are not only reported, but also assessed by the writer. Thus, in these texts we find both manner uses, such as (3a) and (4a), and post-manner uses, such as (7a), where *certamente* conveys an epistemic evaluation, and (11a), where *seguramente* reinforces the writer's aesthetic judgment, showing agreement with an external source.

Finally, in medieval poetry we observe a difference between *certamente* and *seguramente*. The former conveys manner more often than post-manner meanings, whereas the latter performs almost exclusively (inter)subjective functions. This is at odds with what was reported for Spanish by Villar Díaz (2013): in Galician, both adverbs are used as strengtheners or epistemic markers from the earliest attestations – that is, the first half of the 13th century, see the poetry examples (10a) and (16b) – but these functions were much more frequent in *seguramente*; in Spanish, post-manner uses of *seguramente* are not documented until the second half of the 15th century (Villar Díaz, 2013, p. 192), that is to say, more than 200 years later than in Galician.

In this connection Company Company (2012) argues that books of conduct played a major role in the development of *-mente* in Spanish. There was no books of conduct as such in Old Galician. There was, instead, a literary movement that had no equivalent in Spanish, usually known as Galician-Portuguese lyrical poetry and dated from 1200 to 1350 – most of the poetry data from the medieval period corresponds to this literary movement. Although the share of *-mente* adverbs found in poetry is substantially smaller than that of literary prose – but still higher than that of administrative texts – *-mente* adverbs in poetry are very prominent from a qualitative point of view, since this genre sets the stage for intersubjective uses: texts were written in the first person and referred directly to an interlocutor. The lack of texts of this type in Spanish may account for the differences observed in the early development of the adverbs.

After the second half of the 15th century, we lose track of *certamente* and *seguramente*. The next occurrence of *certamente* is in a play in verse from 1697 found in TILG, where it functions as a manner adjunct to the verb *crer* 'believe'. This is an exception because *-mente* adverbs in general, and their (inter)subjective functions in particular, do not become frequent in Modern Galician until the second half of the 19th century. This has to do with the link between these linguistic devices and high-level written genres: *-mente* adverbs (re)emerge in Modern Galician when

new types of prose (fictional, journalistic, essayistic, technical) develop at the end of the 19th century.[8]

A look at the results from the early contemporary period in Table 3 shows that modern *certamente* and *seguramente* are very different from their medieval counterparts – and from one another. *Certamente* has now strengthening as its main meaning, while epistemic modality is marginal and very prone to ambiguity. The most frequent use of *seguramente* is epistemic, whereas strengthening occupies a marginal place in its semantics and is quite invulnerable to ambiguity. This adverb also presents one unambiguous pragmatic use. Manner, in both cases, is extremely rare. These results reveal a shift from primarily manner adverbs to discourse and modal markers, which, of course, is not sharp and takes place over the course of four centuries.

Finally, the results for present-day language in Table 4 show minor differences to the previous period, as is expected given the small temporal distance. Changes in *certamente* are negligible, whereas *seguramente* establishes its role as an epistemic adverb, and loses all other uses. The absence of the manner use is the result of a long-standing shift from a manner to a post-manner adverb. As in early contemporary language, the manner use of *seguramente* is nearly extinct in present-day language, but still retrievable in very marked contexts, where confusion with the epistemic meaning is unlikely. The manner uses of *certamente* are somewhat different, since all of them respond to collocations with the verb *saber*. This pattern was also detected for Dutch *zeker* (Byloo et al., 2007, p. 38), and is, very likely, the fossilization of a medieval collocation.

Table 3. Share of the different meanings of *certamente* and *seguramente* in early contemporary language

	Certamente ***n* = 100** **min (max)**	***Seguramente*** ***n* = 100** **min (max)**
manner	1 (3)	1 (1)
epistemic	6 (19)	87 (90)
strengthening	78 (93)	8 (11)
pragmatic	0 (0)	1 (1)
ambiguity	16	3

8. During this period, we attest the popular variant *-mentes*, with a final *-s*. Nevertheless, in line with the disappearance of the vernacular variants of *-mente* in Old Spanish, that is, *-miente* and variants (Company Company, 2012), this modern popular variant in Galician was never very frequent and declined quickly.

Table 4. Share of the different meanings of *certamente* and *seguramente* in present-day language

	Certamente *n* = 100 min (max)	*Seguramente* *n* = 100 min (max)
manner	3 (3)	0 (0)
epistemic	4 (20)	100 (100)
strengthening	77 (93)	0 (0)
pragmatic	0 (0)	0 (0)
ambiguity	17	0

4. A constructionalization approach

Most previous research on the diachrony of *-mente* advocates for the grammaticalization path manner adverb > sentence adverb > discourse marker. Yet some researchers support a "continuity perspective" that would allegedly exclude a grammaticalization scenario: Hummel (2013b, pp. 29–30) argues that the modal and discourse uses of Spanish *realmente* are a continuation of those of Late Latin *realiter*; similarly, according to Espinosa Elorza (2010, pp. 150–151), Latin *certo, enim* and *vero* were "adapted" in Spanish as *ciertamente, efectivamente* and *verdaderamente*, respectively. Nevertheless, it seems hard to find a Latin forerunner of every *-mente* adverb with a post-manner use, witness *seguramente*.[9]

If (some of) the meanings found in the Romance adverbs were borrowed from previous Latin constructions, the continuity perspective goes, grammaticalization (or constructionalization) would be short-circuited. This position faces at least two problems when applied to our data. First, if *certamente* and, more unlikely, *seguramente* borrowed the uses of Latin forerunners, their status in the Middle Ages would be a reflection of the functional profile, critical contexts included, of the borrowing forms. Thus, from a strict continuity perspective, there is no reason to conclude that the diachronic processes initiated in the original form do not live on in its continuator – in fact, doing so would reinforce the artificial limits between (Late) Latin and (Old) Romance this position is supposed to overcome. Second, the uses of Latin forerunners need to be analyzed in detail in order to establish a continuity between their functions and those of their Romance successors. The

9. *Secure* and *securiter* were adverbial formations from Latin *securus* meaning 'carelessly, heedlessly, fearlessly' or, as their Romance successors, 'safely, securely' (Lewis & Short, 1879, p. 1656). Unlike *certo, enim* and *vero, secure* and *securiter* lacked post-manner meanings.

strengthening use is particularly concerning in this respect, since it is usually not isolated in historical studies, despite being key in understanding the development of the adverbs.

The present study has found evidence, in the form of critical contexts, of a constructionalization channel that leads from manner, through strengthening, to epistemic modality. Rather than just taking on the functions of earlier forms, it seems that *certamente* and *seguramente* continued a constructionalization process possibly begun by other adverbs. Since the Latin evidence that would support such claim is unavailable, I will focus on reconstructing the diachronic trajectory of the Galician adverbs.

4.1 The emergence of (inter)subjective adverbs

Adverbs ending in *-mente* constitute a large and diverse set of linguistic items and exist in most present-day Romance languages. They originated from a Latin construction with the feminine noun *mente* (the instrumental-ablative form of *mens, mentis* 'mind, mood') preceded by an adjective. The Latin construction had both lexical (instrumental) and adverbial (manner) values (e.g. *timida mente* 'with a timid mind/timidly', Bauer, 2010, p. 342). In Romance languages *mente* led to a fully-fledged derivative suffix which creates adverbs out of adjectives in their feminine form. This morphological device had already become grammaticalized in the medieval period, at least since the 9th century (Hummel, 2013a, pp. 20–21).

Given that the Latin string 'adj + *mente*' raised implicatures of adverbial manner values, it is fair to assume that the suffix *-mente* was first used to create manner adverbs. Also, the manner uses were dominant in *certamente* and *seguramente* during the medieval period, and only later do the postmanner functions take over. There is a long-term shift from the semantics of manner – first in the form of a pragmatic inference in a (Latin) instrumental construction, then as the coded meaning of a (Romance) adverbial suffix – to more procedural meanings, and this is in line with a grammatical constructionalization scenario.

At the time when *certamente* and *seguramente* were used in Old Galician texts *-mente* was a productive suffix. Therefore, the manner uses of the adverbs were derivations from the adjectives *certo* 'true, certain' and *seguro* 'safe, secure' in their feminine form. The manner adverbs *certamente* and *seguramente* were instantiations (micro-constructions) of a more abstract, semantically more general pattern (a schema or schematic construction) in the *-mente* format, with phrasal syntax and the general meaning 'manner'.

As for the post-manner uses, they emerged as invited inferences in the relevant critical contexts (manner/strengthening, strengthening/epistemic). Although the strengthening use was the most ambiguous in the medieval period (7 out of 12, or

more than 58% of occurrences), unambiguous cases, or *isolating* contexts, already existed (amounting to 5 out of 12, or more than 41% of cases), which point toward an increasing separation of the strengthening meaning from manner uses. In fact, the early development of such contexts enabled the rise of the epistemic meaning out of strengthening uses. In turn, these unambiguous sentential-scope readings fueled the development of sentential syntax. The eventual conventionalization of strengthening and epistemic meanings in a new syntactic packaging led to the constructionalization of two polysemic (strengthening and epistemic) post-manner adverbs, i.e. the creation of two new nodes in the constructional network, one for post-manner *certamente* and another one for post-manner *seguramente*. This process involved not just the development of (inter)subjective, therefore procedural, meaning, but also a decrease in compositionality, since the new (micro-)constructions were not linked to the manner schematic construction – they could not be productively derived from *-mente*.[10]

The said long-term shift from manner adverbs to polysemic post-manner markers is common to both *certamente* and *seguramente*, but the further arrangement of strengthening and epistemic meanings differs for each adverb. As regards *certamente*, the strengthening use became prominent without leading to the extinction of the epistemic use. This situation of unequal polysemy has been stable from the end of the 19th century to the beginning of the 21st century, according to the data. The reasons for the predominance of the strengthening use may be pragmatic. Since the default expression for certainty (i.e. the epistemic value of *certamente*) is a bare assertion, the use of marked expressions of certainty must happen in extraordinary circumstances and have special pragmatic effects. Therefore, explicit references to certainty are infrequent in language, as the results above and Byloo et al.'s (2007) show. Conversely, strengthening is, from the point of view of communication, a very prominent function, usually related to the speaker's goals in discourse. This pragmatic suitability might have played an important role in the entrenchment of the strengthening use. The semantics of *seguramente*, though, followed a different path, that is to be addressed below.

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10. Present-day *-mente* forms not only manner adverbs, but also temporal adverbs (e.g. *antigamente* 'in the past'), evidential markers (e.g. *obviamente* 'obviously'), and "point-of-view" adverbials (e.g. *politicamente* 'in political terms'), among others. This means that *-mente* became more schematic so as to produce different types of adverbial forms, not just manner ones. The particulars of this process are beyond the scope of this paper, but, from a usage-based constructional perspective, this must have happened in a bottom-up fashion – i.e. a change from token nodes (each 'new' *-mente* adverb with a temporal, evidential or epistemic meaning) to type node (a temporal, evidential or epistemic schema) as a result of generalization across similar micro-constructions. The growing number of non-manner *-mente* (sub)schemas eventually led to further schematization, whence the present-day *-mente* pattern with a rather vague procedural meaning.

4.2 *Seguramente*: A new probability marker

Qualifying a state of affairs with the highest epistemic value, instead of using an unqualified assertion, has apparently undesired pragmatic effects, such as signaling that the speaker is not really sure about what they are saying and/or that there is some reason to doubt it – otherwise, why would they "insist" on certainty? Considering this, one would expect that the epistemic value of a marker of certainty would either become weaker (go down the epistemic scale), as a result of the conventionalization of the implicature of uncertainty, or that it would be sparsely used. The latter is the case of *certamente*, whereas the evolution of *seguramente* conforms to the former.

Hummel (2018) and Míguez (2019) describe in some detail how certainty items become weaker over time. This has to do with the mentioned communicative profile of certainty markers, but also with the notion of subjectivity. Delbecque (2009) shows that the Spanish adjectives *cierto* and *seguro* are distinguished in terms of (inter)subjectivity (in the sense of Nuyts, 2001): *cierto* codes intersubjective certainty (shared between the speaker and others) and *seguro* subjective certainty (only ascribable to the speaker). The epistemic adverbs derived from the adjectives inherit this semantic trait (cf. the discourse patterns of Italian *certamente* and *sicuramente*, Pietrandrea, 2008), and that explains their different developments. The subjective certainty of *seguramente* favored the implicatures of uncertainty, which in the early contemporary period were already very general. This caused the collapse of the strengthening use, which is incompatible with the semantics of uncertainty, since this is associated with mitigation, rather than reinforcement (Míguez, 2019). The pragmatic use, in turn, relates to epistemic expressions with some degree of epistemic instability (the coding of both certainty and uncertainty), such as *surely* and *zeker* (Byloo et al., 2007, p. 55). *Seguramente* developed the uncertainty use somewhere in the early modern period,[11] and this probably opened the door for the pragmatic use. In the early contemporary language this use was nearly extinct, which is an indication of the near consolidation of the probability meaning. This meaning is conventionalized in present-day Galician, and is, in fact, the only meaning found in the sample. With this semantic shift *seguramente* experiences a decrease in compositionality, inasmuch as the link with the adjective *seguro*, which retains the certainty semantics, is broken. Thus, *seguramente* no longer opposes *certamente*, but *probablemente* 'probably', again in terms of (inter)subjectivity.

11. Studies on Spanish *seguramente* differ as to the precise dating: some situate it in the 18th century (Espinosa Elorza, 2014, p. 1077), whereas others situate it already in the 16th century (Villar Díaz, 2013, p. 192).

The semantic innovation of *seguramente* comes along with a change in morphosyntactic patterns. In several Romance languages, when an epistemic adverb precedes a finite verb, grammatical mood may alternate between the indicative and the subjunctive (see e.g. Yelin & Czerwionka, 2017).

This alternation is possible with probability and possibility adverbs, but not with certainty markers. Crucially, present-day *seguramente* triggers the indicative/subjunctive alternation, like *probablemente* and unlike *certamente*. Series (18) illustrates this.

(18) a. *Eles* ***seguramente*** *<u>viana</u> e <u>estaban</u> máis ó tanto da súa vida ca min …*
'They probably saw (IND) her and were (IND) more in the know about her life than me.' (1991, SEGUNARR0097, CORGA)

b. *Ben, se cadra é un mal exemplo,* ***seguramente*** *<u>adoptasen</u> o estilo por escandalizar, polo tabú que supón o consumo de macoña.*
'Well, maybe it is a bad example, they probably adopted (SUBJ) the style to scandalize, because of the taboo associated with the use of marijuana.' (2007, SEGUNARR0672, CORGA)

The semantic shift from certainty to probability, together with the development of the mood alternation is an instance of grammatical constructionalization – notice the decrease in compositionality – and deintersubjectification – witness the loss of intersubjective functions, namely pragmatic and strengthening meanings.

5. Final remarks

The development of a suffix out of the Latin noun *mens* is a classic example of grammaticalization (Hopper & Traugott, 2003, pp. 140–142). This paper has shown that such an advance toward a more grammatical status continues across some particular instances of Galician *-mente* adverbs, namely in the form of a shift from manner to post-manner meanings. It has also shown that the intersubjective strengthening meaning developed before (and led to) the subjective epistemic meaning, in contradiction with the unidirectionality of (inter)subjectification. Finally, the evolution of *seguramente* from an epistemic adverb with strengthening and pragmatic uses to a pure probability marker is an example of deintersubjectification. As is also the case with Spanish epistemic adverb *tal vez* (Cornillie, 2016), the loss of the intersubjective uses in *seguramente* is accompanied by the development of the indicative/subjunctive alternation. The evolution of *certamente*, although not a case of deintersubjectification, verifies the importance of intersubjective uses in the early development of epistemic (and evidential) expressions. Interestingly, this seems to also be the case of English *surely*, since "[i]n older texts it has mainly an emphasizing [i.e. strengthening] function" (Traugott, 2014, p. 82).

Unidirectional (inter)subjectification is a robust tendency in language change, and some of the documented exceptions may be just apparent (López-Couso, 2010, pp. 142–143; Traugott, 2007, pp. 303–304). However, there is growing evidence that unidirectional (inter)subjectification may not be applied so easily to (or may be systematically circumvented by) a well-defined set of expressions, namely epistemic adverbs and evidential (semi-)auxiliaries. The reasons for this are not clear and deserve further investigation.

Other intriguing issues that arise from the current study have to do with the (inter)subjective (in Nuyts's sense) features of *certamente* and *seguramente* – according to Nuyts (2001), adverbs are neutral as regards (inter)subjectivity – and the relation of the indicative/subjunctive alternation with the less intersubjective (in Traugott's sense) uncertainty adverbs.

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Unfolding constructions

Postmodal auxiliaries in mirative complement patterns

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This paper explores the semantic motivation of postmodal auxiliaries in complement constructions conveying mirativity in French and Finnish. French *pouvoir* 'can' and Finnish *pitää* 'should' both occur as postmodal markers in complements of epistemic and axiological items. These constructions refer to events that deviate from what is discursively projected as expected. As a modal verb of possibility, *pouvoir* profiles the meaning '**p** and not ¬**p**', which is based on an opposition, while *pitää*, originally a necessity verb, gives prominence to the paradigmatic meaning '**p** instead of $\mathbf{q}_1$, $\mathbf{q}_2$…'. While the two verbs function in a similar manner as indexes of an interclausal semantic link in mirative constructions, the meaning of unexpectedness is not construed in the same way, and the critical contexts in the evolution of postmodal complement patterns with *pouvoir* and *pitää* are of a different type.

Keywords: postmodality, procedural meaning, grammaticalization, complement constructions, modal verbs, subjunctives, mirativity, affect, French, Finnish

1. Introduction

1.1 Objectives of the study

This paper investigates the reanalysis of modal verbs into postmodal markers of interclausal cohesion in complement constructions expressing unexpectedness. Both possibility and necessity grammaticalization paths can lead to a postmodal complement function (van der Auwera & Plungian 1998). The focus in this study is on the construction-level semantic mechanisms by which the recategorization (Lehmann 2005) emanates in each of the two modal domains. The studied constructions (henceforth, *postmodal complement constructions* or *PCCs*) include a complement containing a postmodal auxiliary governed by (1) a (possibly negated)

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mental verb, noun or adjective or (2) a stance verb, noun or adjective. They can be partially schematized as shown here:

(1) [[Mental-V/N/Adj] Compl Postmodal-V]

(2) [[Stance-V/N/Adj] Compl Postmodal-V]

In French, the postmodal verb slot is occupied by *pouvoir* in the subjunctive mood (henceforth *pouvoir*$_{PM}$) (3). *Pouvoir*$_{PM}$ stems from a modal auxiliary of possibility ('can'). In Finnish, the same postmodal function is performed by the verb *pitää* in the present or preterite indicative (*pitää*$_{PM}$) (4). As a modal auxiliary, *pitää* encodes necessity ('should'). Both examples illustrate the PCC of the type (1), including a negated mental adjective (3) or verb (4).

(3) *C' est incroyable que la guerre* ***puisse*** *être finie.*
EXPL be.3SG incredible COMPL ART.DEF war POUVOIR.SUBJ.3SG be.INF finish.PTCP.PST
'It is incredible that the war **should** be over.' (Frantext, Torrès)

(4) *mitenkää en ois uskont*
no.way NEG.1SG AUX.COND believe.PTCP.PST
'there is no way I could have believed'
jot näiv vanhaaks ***pittää*** *elleä ku jäil leskeks*
COMPL this old.TRA PITÄÄ.3SG live.INF when stay.PRET.1SG widow.TRA
'that (one >) I **should** live this old when I became widow' (SA, Rautu)[1]

The studied PCCs yield an implicative reading: in (3), 'the war is over'; in (4), '(one >) I lived this old'.[2]

The label *postmodal* refers to auxiliary functions that result from further development of modal verbs and go beyond non-implicative possibility and necessity (van der Auwera & Plungian 1998, Barbet & Vetters 2013). In the case of *pouvoir*$_{PM}$, these functions have also been considered as *discursive*, because the (post)modal meaning of the verb is highly dependent on other modal markers and the communicative context. The postmodal verb could, indeed, be omitted without changing the modal meaning of the clause significantly (see 3′ and 4′) (cf. Le Querler

1. In data source indications, abbreviations referring to dialectal data (SA, DLC) are followed by the name of the town or village represented by the informant, while extracts of literary data (*Frantext*, *Literature*) are identified with the name of the author.

2. In (4), the complement displays zero person reference: it lacks overt subject, while the verb is in 3SG (see Laitinen 2006). In this example, the subject referent of the complement-taking mental verb is the predominant implied referent in the complement (note the first person reference also in the following temporal clause).

2001: 22–23). In French, the lexical verb would then take the subjunctive mood (3′). In Finnish, the lexical verb would appear either in the indicative or the conditional mood (4′).

(3′) *(---) que la guerre* ***soit*** *finie.*
COMPL ART.DEF war be.SUBJ.3SG finish.PTCP.PST
'(---) that the war **is** over.'

(4′) *(---) jot näiv vanhaks /* ***elän*** */* ***eläisin***
COMPL this old.TRA live.IND.1SG/ live.COND.1SG
'(---) that I **live/would live** this old'

As for *pitää*, the postmodal uses have been described as *affective*, as they occur in reactive situations, such as surprise and bemoaning (Laitinen 1992: 237–241). Since their semantic contribution is very subtle, postmodal markers appearing in complement clauses have also been qualified as "near-automatic concomitants" (van der Auwera & Plungian 1998: 94). This description makes apparent that postmodal markers are tightly associated with certain types of complement clauses (*op. cit.*).

The objectives of the present study are the following:

The paper aims to tease out the semantic motivation behind postmodal complement items, by exploring the different grammaticalization paths that *pouvoir*$_{PM}$ and *pitää*$_{PM}$ have taken to go beyond their modal uses in coding possibility and obligation. The modal uses are displayed in (5) and (6).

(5) *À la vérité, je ne crois pas*
PREP ART.DEF truth 1SG NEG believe.1SG NEG
'To be honest, I don't think'
que l'on ***puisse***
COMPL INDEF POUVOIR.SUBJ.3SG
'one **can**'
comprendre Racine avant l'âge de vingt-cinq ans.
'understand Racine before the age of twenty-five.' (Frantext, Aymé)

(6) *se ei ymmärtänny että se* ***pittää*** *savotamieski*
3SG NEG.3SG understand.PTCP.PST COMPL EXPL PITÄÄ.3SG lumberjack.CLT
'S/he didn't understand that even a lumberjack **must**'
olla vähän oppinu.
'be a little educated.' (DMA, Kolari)

This evolution appears to have taken place in slightly different constructions following the modal origins of the verb, although the resulting constructions are remarkably similar. In both languages, the studied PCCs convey a mirative reading (see e. g. DeLancey 1997, 2012; Aikhenvald 2012; Peterson 2016): they describe the

taking place of an event that does not correspond to what the speaker or the subject referent of the main clause projects as expected (more specifically real, ordinary or acceptable), but the unexpectedness is not profiled similarly.

Another objective is to test whether adopting a constructionist approach can contribute to our understanding of the transition from the modal to the postmodal side of the semantic map. As the distinction between lexical and grammatical expressions is considered to be gradient (Goldberg and Jackendoff 2004: 532; Traugott & Trousdale 2013: 13), modal and postmodal auxiliaries can be seen as representing different degrees of procedural meaning (see Trousdale 2014: 559). It is also important that within this framework, the dynamics between the modal auxiliary and its lexical context has been shown to be crucial (see Hilpert 2016). In the case of postmodal complement items, the semantics of the matrix verb is of particular interest but it does not alone allow to account for the use of an originally modal auxiliary in utterances conveying mirativity. The results of the study shed light on the non-compositionality of complement constructions (see Cristofaro 2008).

Finally, the aim is to account for the function of postmodal complement items, in cognitive semantic terms, within the chain-like composite construction that unfolds through processing time (Langacker 2014). On a conceptual level, the matrix sets up a mental space (Fauconnier 1985) framed by the epistemic or axiological limits beyond which the event coded by the complement clause goes (see Bres & Labeau 2013). The postmodal verb gives linguistic form to the incompatibility between this event and the reality as projected by the speaker or the subject referent of the main verb.

The paper is organized as follows: Section 1.2. presents the dataset. Section 2.1. outlines the semantic properties of *pouvoir* and *pitää*, including their postmodal functions. Section 2.2. describes the approach taken here to interclausal links. The results of the analysis are set out in Section 3, according to the lexical semantics of the matrix. Section 4.1. deals with the grammaticalization of PCCs, and Section 4.2. discusses the interplay between postmodality and interclausal cohesion. The discussion in Section 5 includes some comparative remarks concerning postmodal auxiliaries in different languages and with regard to the subjunctive mood. Section 6 concludes the paper.

1.2 Data

The French data come from the *Frantext intégral* database, which is a large and heterogeneous corpus of mostly literary (90%) texts in French.[3] The label *literary* covers a variety of non-scientific and non-technical text genres: not only novels, drama and poetry but also memoirs, autobiographies and diaries. The search for *pouvoir*$_{PM}$ in complement position was first run in the *Contemporary French* part of the corpus (554 texts from 1980 till 2019). This resulted in 278, partly manually identified occurrences. For the purpose of diachronic investigation, complementary searches were then conducted in the *Old French* (59 texts from before the 14th century) and the *Classical French* (1103 texts from 1650 till 1799) parts of *Frantext intégral*. No occurrences of *pouvoir*$_{PM}$ in the complement positions under study were found in the *Old French* part of the corpus. As the studied constructions are not very frequent even in contemporary language use, the result may be due to the relatively feeble amount of data from this period and the text types included in the corpus. It is therefore difficult to draw any reliable conclusions concerning the grammaticalization of *pouvoir*$_{PM}$ on the basis of this result. On the other hand, all the uses of *pouvoir*$_{PM}$ that were observed in contemporary data were also found in the *Classical French* part of the corpus. They will be discussed later in this paper.

The Finnish dataset is collected from a heterogeneous set of sources covering a time period from 1880 to 2012: literary texts, internet discussion groups and dialectal recordings. The following data sources were used: Corpus of internet discussions from 2012 (Suomi 24), Corpus of Finnish literary classics (FLC), dialectal recordings from the Digital Morphology Archives (DMA) and the Syntax Archives (SA). Some sporadically collected occurrences found in the literature were also included in the dataset. In this rather large amount of data, I have been able to gather 101 occurrences of *pitää*$_{PM}$ in complement clauses.

The scarcity of *pitää*$_{PM}$ occurrences shows that, while *pitää* is one of the most frequent verbs in Finnish (7th most frequent among verbs and 29th most frequent among all lexemes in Saukkonen et al. 1979), this particular construction is reserved for a limited number of communicative contexts. On the other hand, the fact that the construction can be found in different types of data from the 1880s until the 2010s proves that this association pattern between syntactic structure and lexical items is identifiable to language users and has a certain long-term conventionalized status in language.

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3. Complete references to the data sources used for both French and Finnish are provided at the end of this paper.

The French and Finnish parts of the dataset are asymmetrical not only in terms of the total number of occurrences but also when it comes to the time span covered by the data. In Frantext database, it was possible to search PCCs with *pouvoir*$_{PM}$ in large corpora extending over several centuries. Establishing a diachronic corpus for *pitää*$_{PM}$ is more difficult a task, as the early written Finnish was strongly influenced by South-Western dialects, while the implicative meaning of *pitää*, which has led to the postmodal use under study (see below), is of Eastern (and Ostrobothnian) origin (Laitinen 1992: 213–222, 240). Furthermore, due to their genre, the oldest texts in Finnish (from the 16th century) are likely to report fairly seldom the types of reactive situations where *pitää*$_{PM}$ tends to occur. Elsayed (2017: 159), who investigated *pitää* in the literary works of Mikael Agricola (approximately 1510–1557), considered as the founder of Finnish written language, reports to have found no examples of the affective use in her corpus of more than 4000 occurrences of *pitää*.[4] For the present study, I searched *pitää*$_{PM}$ in the Corpus of Old Literary Finnish (VKK), containing texts from 1543 to 1809. The results of this search will be discussed later in the paper.

PCCs form a very specific and specialized micro-construction within a larger complementation schema (see Traugott 2015: 53–54) where modal *pouvoir* and *pitää* appear in a complement clause more or less independently of the lexical semantics of the complement-taking predicate (see examples 5 and 6 above). The data therefore remains limited, and the disparities between and within the two parts of the dataset are potentially significant. The analysis concerning the evolution of *pouvoir*$_{PM}$ and *pitää*$_{PM}$ is thus essentially grounded on what we know of the grammaticalization of modal auxiliaries (e. g. Bybee, Perkins & Pagliuca 1994, van der Auwera & Plungian 1998), and the few quantitative observations presented below should be regarded as hypothesis-generating. A strength of the present study is that, in both French and Finnish parts of the dataset, dialogical context is strongly represented, in literary dialogues and internet discussions. This allows for the reactive dimension of PCCs to surface.

4. Elsayed (2017: 158–159) observes, however, that the occurrence of *pitää* in the following extract comes close to the affective use.

(i) *Sille ette hen Hurskas oli ia heiden seasans asui /*
'for he was a good man and lived among them'
ia quitengin sencaltaista ***piti*** *nekemen ia cwleman*
and still that.type.of PITÄÄ.PRET.3SG see.INF.INSTR and hear.INF.INSTR
'and still he **should** see and hear those (evil) things.' (*New Testament,* 2 Peter 2:8)

2. Postmodality and mental accessing of complements

2.1 The modal and postmodal semantics of *pouvoir* and *pitää*

Pouvoir$_{PM}$ and *pitää*$_{PM}$ have undergone, first, the process of auxiliation. They have gradually been desemanticized from their lexical meaning and resemanticized, through pragmatic inference (see e. g. Traugott 1995), so that they have acquired new, more abstract meanings (e.g. Lamiroy & Drobnjaković 2009: 20 and the literature cited). Continuing the development further away from the original lexical, concrete meaning, they have then left behind their lives as semantically relatively weighty modal auxiliaries and become grammatical markers of the conceptual configuration underlying a complex linguistic construction (on the different degrees of grammaticalization in auxiliaries, see Krug 2011: 557).

Barbet (2015: 214–215) retraces the evolution of *pouvoir* from the premodal meaning 'to be strong'[5] through modal meanings of participant-internal possibility (capacity) (example 7) and participant-external possibility, including deontic modality (permission) (8), to epistemic meaning (9) and, finally, to postmodal functions (cf. Gougenheim 1929: 226; Buridant 2000: 293), including concession, interrogation, imperative, optative and, what is of particular interest in this paper, complementation (Barbet & Vetters 2013: 328). Figure 1, based on van der Auwera & Plungian's (1998: 98) semantic map (see also Barbet 2015: 214), sums up the different stages of the grammaticalization process of *pouvoir*.

(7) *Le guépard* ***peut*** *accélérer à plus de 100 km/h.*
ART.DEF cheetah POUVOIR.3SG accelerate.INF PREP more PREP
'A cheetah **can** accelerate to more than 100 km/h.'

(8) ***Pouvons*** *– nous nous asseoir ici ?*
POUVOIR.1PL 1PL REFL.1PL sit.INF here
'**May** we sit here?'

(9) *Un burn-out* ***peut*** *arriver à tout le monde.*
ART.INDEF burnout POUVOIR.3SG happen.INF PREP everyone
'Burnout **can** happen to anyone.'

5. See also TLFi (*s. v. pouvoir,* Étymol. et Hist. 1.). The concrete meaning of 'strength' has continued to be present in the noun *pouvoir*, e. g. *Son pouvoir n'est fondé que sur votre faiblesse* 'Her power is founded only on your weakness' (*Les Femmes Savantes* de Molière, cited in *Petit Robert, s. v. pouvoir*, 2., 4.) (see also the etymology of the English *power* in OED).

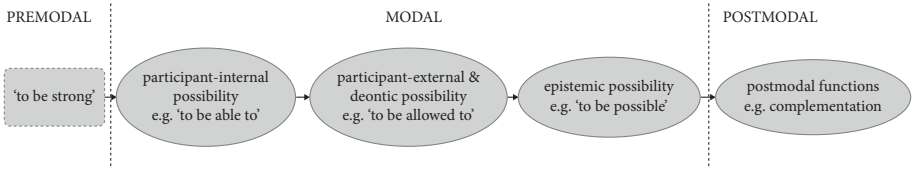

Figure 1. The grammaticalization of *pouvoir*, based on van der Auwera & Plungian's (1998: 98) semantic map (see also Barbet 2015: 214)

In its contemporary uses, *pouvoir* is marked by semantic vagueness (in Le Querler's 2001 terms *underspecificity*): participant-internal, participant-external and epistemic meanings can overlap in a single clause (see Geeraerts 1993; Tuggy 1993).

According to Barbet & Vetters (2013: 238), all postmodal uses of *pouvoir* share the function of affecting (mitigating, reinforcing, modifying) the illocutionary force of the utterance. Postmodal *pouvoir* has previously been studied mostly in main clause position, namely in exclamative clauses, as in (10).

(10) *Ce qu' il* ***peut*** *être agaçant !* (Le Querler 2001: 26, 29)
EXCL 3SG POUVOIR.3SG be.INF annoying
'He is so annoying!'

Le Querler (2001: 26) views this type of uses of *pouvoir* as contributing to intensify the propositional content and paraphrases the sentence presented in (10) as *Je trouve qu'il est vraiment particulièrement agaçant* 'I think he really is particularly annoying'. Le Querler also notes that this use is one of those where the specific interpretation is attributable not only to *pouvoir* but to the entire sentence structure. Barbet (2012: 54–55) argues that the intensifying effect results, indeed, from the exclamative speech act, not from the meaning of *pouvoir.* By using the existential modal *pouvoir* (see e.g. Palmer 1990: 107–109; Cappelle & Depraetere 2016) in an exclamative utterance, the speaker displays that an anticipatory hypothesis is brutally cancelled out and that their universe of belief is therefore modified.

These observations concerning the affective stance and the semantics of *pouvoir* speak of a certain degree of noncompositionality of the construction. I suggest that in complement clauses $pouvoir_{PM}$ and $pitää_{PM}$ function in a comparable way, with the distinction that the meaning of unexpectedness is accessed through the matrix within the interclausal semantic relation. In other words, not only does the PCC holistically convey affective stance in a way comparable to exclamative utterances, but the postmodal meaning of *pouvoir* can only be identified by looking at the PCC as a whole.

Le Querler (2001: 29) has also identified a so-called deliberative use of *pouvoir*, illustrated in (11).

(11) *On se demande comment il* ***a pu*** *faire.*
INDEF REFL.3SG ask.3SG how 3SG AUX.3SG POUVOIR.PTCP.PST do.INF
'One can only wonder how on earth he did that'. (Le Querler 2001: 29)

According to Le Querler (2001: 29), *pouvoir* marks here the degree of speaker's certainty about the propositional content, in other words epistemic meaning (cf. in English *He* ***can't*** *have done that!*). Barbet & Vetters (2013: 324) point out, however, that we could also be dealing with dynamic possibility, in other words a meaning of capacity. This double reading is often found in the complement use of *pouvoir*$_{PM}$, as well.

The postmodal complement use of *pouvoir* studied in this paper only concerns subjunctive clauses. The results of a corpus search with *pouvoir* in the indicative mood do not include occurrences of PCC. The connection between the (post)modal meaning of *pouvoir* and the subjunctive mood has already been pointed out by Boissel et al. (1989: 30) and Barbet & Vetters (2013: 322–323). Furthermore, in a previous study, *pouvoir* held the second position among verbs that occurred most frequently in the subjunctive mood in subordinate position (Peltola 2011: 50–59). The interplay between *pouvoir*$_{PM}$ and the subjunctive mood is dealt with in Section 5.

Pitää, as a necessive verb, has its counterpart in all Balto-Finnic languages (Kehayov & Torn-Leesik 2009: 368).[6] Its modal uses are considered to have developed from the concrete meanings 'to grip', 'to stick' and 'to hold' (Laitinen 1992: 137–138 and the literature cited, 1997: 120). In this sense, the origins of the necessive *pitää* are comparable to the etymology of *to have (to)* as an expression of obligation in English (Bybee & Pagliuca 1985: 72), as well as the double meaning of *to be bound to* (< *to bind*). In its premodal uses, *pitää* shows full person agreement and can be used in intransitive (12) or transitive (13) constructions.

(12) *Sukset eivät lipsuneet, hyvin* ***pitivät****.*
ski.PL NEG.3PL slip.PTCP.PST.PL well PITÄÄ.PRET.3PL
'The skis didn't slip, they **adhered** well (to the snow)'.

(13) ***Pidä*** *kädet ylhäällä!*
PITÄÄ.IMP.2SG hand.PL up.ADE
'**Keep** your hands up!'

The premodal meanings of *pitää* involve dynamics between an agonist force that tends towards movement and a resisting antagonist force that withstands change and maintains stability (see Elsayed 2017: 16–17; on force dynamics, see Talmy 1988). This tension between opposing forces underlies the modal and postmodal uses of *pitää*, as well.

6. For a contrastive overview of the Finnish *pitää* and the Estonian *pidama*, see Elsayed (2017: 64–65). For the modal uses of Karelian *pidäy*, see Sarhimaa (1999: 104–111).

In its modal and postmodal uses, *pitää* always occurs in 3rd person singular form and takes an infinitive complement.[7] Similarly to other necessive constructions in Finnish, a *pitää* clause lacks a prototypical subject: the subject-like argument displays case alternation between the genitive and the nominative and it does not trigger verb agreement. In standard Finnish, the genitive subject prevails (on the creation of the standard norm and the semantic distinction between the genitive and the nominative subjects, see Laitinen 1997).

Pitää covers all types of necessive meaning: in (14) we have a case of participant-internal (dynamic) necessity, in (15) participant-external (deontic) necessity, and in (16) evidentiality. Figure 2, based on van der Auwera & Plungian's (1998: 98) semantic map, exposes the grammaticalization path of *pitää*.

(14) *Minun* ***pitää*** *levähtää hetki.*
1SG.GEN PITÄÄ.3SG rest.INF moment
'I **have to** rest for a while.'

(15) *Valtion* ***pitää*** *turvata terveyspalvelut koko maassa.*
state.GEN PITÄÄ.3SG ensure.INF health.service.PL whole country.INE
'The state **must** ensure health services in the whole country.'

(16) *Kakun* ***pitäisi*** *olla jo kypsä. Ota se pois uunista!*
cake.GEN PITÄÄ.COND.3SG be.INF already ready
'The cake **should** be ready now. Take it out of the oven!'

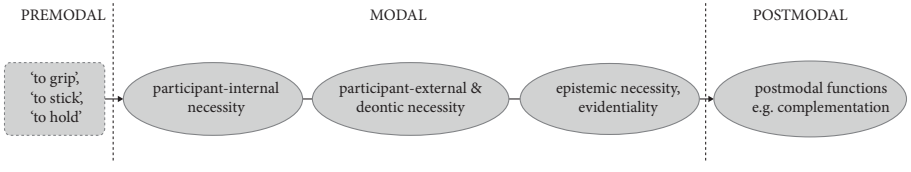

Figure 2. The grammaticalization of *pitää*, based on van der Auwera & Plungian's (1998: 98) semantic map

The postmodal *pitää* occurs in utterances expressing certain types of future time reference (e.g. fatality) and affect. The implicative reading is characteristic of the uses of *pitää* in the Eastern and Ostrobothnian dialects (Laitinen 1992: 215–216; Elsayed 2017: 58–61).[8] The postmodal complement use concerned in the present paper derives from the meaning of implicative obligation (Laitinen 1992: 237–238).

7. On the regional variation in the form of the infinitive, see Laitinen (1992: 213–222) and Elsayed (2017: 111).

8. The PCC data of the present study corroborate previous geographical observations: 11 of the 19 *pitää*$_{PM}$ occurrences in dialectal recordings come from the Ostrobothnian group and 5 from

In the Western dialects, *pitää* receives a non-implicative necessive reading. The difference is most apparent in the preterite: when associated with an implicative *pitää*, the past-time affix *-i-* marks that both the necessity for the event expressed by the infinitive to take place and the event itself are anterior to the moment of speech (*ibid.* pp. 213–216, 264–265; 1997: 123, note 1; Elsayed 2017: 58–61).[9]

The non-implicative meaning has given rise to another type of subordinate use, illustrated in (17).

(17) *Tuuppas oven auki,*
'(S/he) pushed the door open,'
että ***piti*** *tulla* *vilposempaa* *ilmaa.*
CONJ PITÄÄ.PRET.3SG come.INF fresh.COMP.PART air.PART
'so that fresher air **would** come in.' (Dialectal data from the municipality of Virrat, cited by Setälä 1883: 138 and Laitinen 1992: 243)

In these contexts, the preterite form of *pitää* has grammaticalized into a marker of past time future and purpose (Laitinen 1992: 242–243).

The function of the implicative *pitää*$_{PM}$ in complement constructions does not seem to be as strongly associated with past time reference as the non-implicative use shown in (17). In the dataset used, 71 out of 101 occurrences of *pitää*$_{PM}$ were in the preterite form, while 30 were in the present tense. From a semantic perspective, the *pitää*$_{PM}$ found in PCCs shares more similarities with the implicative *pitää*$_{PM}$ used in main clauses (example 18) than with the non-implicative subordinate use.

(18) *no* *kyllä* ***pittää*** *olla* *paikka*
PTCL PTCL PITÄÄ.3SG be.INF place
'(to think) that such a place **should** exist'
(Morphology archives, Pihtipudas, cited by Laitinen 1992: 239)

Pitää$_{PM}$ is not indispensable for the affective meaning to arise, but it brings to the fore the intensionality of the state of affairs: '(to think) that of all available alternatives this is the one that took place' (Laitinen 1992: 238–239; 1997: 116; see also Kehayov 2016: 472–473). The factual state of affairs is conceptualized as a theoretical possibility among others (Leech 1987 [1971]: 113–116; Laitinen 1992: 240). In a main clause position, the interactional context, namely the status of the *pitää* utterance as a reaction, as well as the phrasal construction, including discourse

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the Eastern group. 2 of the 3 remaining occurrences have been recorded at a liminal district adjacent to Eastern dialect area.

9. Caudal (2018: 109–110) refers to this type of postmodal semantics in French past-time modal expressions as *demodality*: the modal meaning in question is no longer active at the moment of speech. Larreya (2015), studying the English *would*, uses the term *modalisation a posteriori*.

markers, interact with the meaning of *pitää*$_{PM}$. In example (18), the clause-initial particles contribute to conveying affect and expressing astonishment. The particle *no* is a frequent marker in responsive utterances of this type (see Vepsäläinen 2019: 67–68). The particle *kyllä*, on the other hand, occurs in copulative clause constructions in reactive assessments, conveying intensity (see Keevallik & Hakulinen 2017: 125–126). In PCCs, on the other hand, the interclausal link comes into play.

As with the main clauses with *pouvoir*$_{PM}$ and *pitää*$_{PM}$, PCCs describe events that deviate from the expected order of things. More precisely, *pouvoir*$_{PM}$ and *pitää*$_{PM}$ profile the incompatibility between the event expressed in the complement clause and the reality as projected by the speaker or the subject referent of the matrix. The semantics of PCCs presents some similarities with what has been called in French "the effect of extraordinary" (Damourette & Pichon 1911–1936, V, § 1652; Bres & Labeau 2013). The term comes from studies concerning the modal uses of the verbs of movement *aller* and *venir*, illustrated in (19).

(19) *et cet imbécile il* ***est allé*** *se rappeler*
and DEM imbecile 3SG AUX.3SG ALLER.PTCP.PST REFL.3SG recall.INF
'and that imbecile **just had to** recall'
ce que je lui avais promis !
'what I had promised to him (though I expected/hoped he had forgotten)'
(conversation, 2010, cited by Bres & Labeau 2013: 153)

The meaning of unexpectedness expressed by the periphrastic constructions with *aller* and *venir* is obviously derived from a very different origin than that conveyed by *pouvoir*$_{PM}$ and *pitää*$_{PM}$. Despite these differences, Bres & Labeau's (2013) analysis of the effect of extraordinary has proved to be useful in understanding the meaning of unexpectedness in PCCs. The meaning of extraordinary arises in a situation where an event is viewed as going beyond a discursively set epistemic or (deontic-)axiological limit. In other words, there is an incongruity with regard to what, according to the speaker, is expected: possible and predictable, on the one hand, or acceptable, correct and appropriate, on the other (*ibid.* pp. 158, 165). In their complement use, *pouvoir*$_{PM}$ and *pitää*$_{PM}$ mark this type of abstract movement with regard to the universe of beliefs of the speaker or the subject referent of the matrix, but each of the two verbs construes the meaning of transgression of limits on different grounds, because of their different modal origins.

Figure 3 sums up the mirroring grammaticalization paths of *pouvoir*$_{PM}$ and *pitää*$_{PM}$. It is a simplified and adapted version of van der Auwera & Plungian's (1998: 98) semantic map. The larger array of premodal and postmodal meanings is not exposed here, and I have added the lexical origin of (post)modal *pitää*. The red lines emphasize the parallelism.

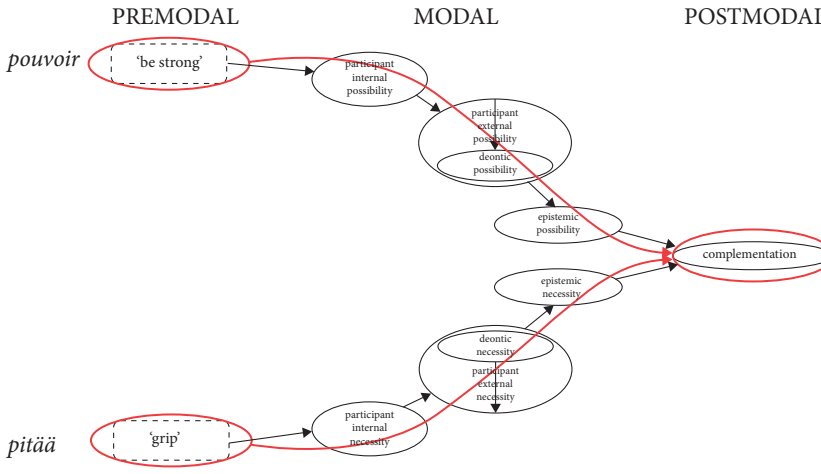

Figure 3. The grammaticalization paths of *pouvoir*$_{PM}$ and *pitää*$_{PM}$ occurring in PCCs. Adaptation of van der Auwera & Plungian's (1998: 98) semantic map

The analysis in this study seeks to shed light on the ways in which the semantic process through which each of the two verbs has gone through is reflected in the postmodal complementation use.

2.2 Interclausal chains

Following Langacker's (2008, 2014) dynamic account of complex constructions, PCCs are regarded in this study as chain-like serial, rather than hierarchical, conceptual arrangements. The approach is based on Fauconnier's (1985) model of mental spaces. These are momentary conceptual units which are construed and modified in discourse constantly. Human understanding and acting are based on the dynamics of these units.

Complex constructions are dynamic structures that unfold through processing time, so that each unit is perceived in its own "window of awareness" (a viewing frame, a momentary locus of attention). The immediate scope of attention, which constitutes the primary window, moves through speech time. The processing of each element in the complex construction is retrospectively and prospectively constrained and influenced by what has occurred in prior windows and what is expected to occur in subsequent windows (Langacker 2014: 28). This is represented in Figure 4, where A, B, C etc. are conceptually overlapping members of a complex structure. The retrospective and the prospective aspect of the conceptualization of

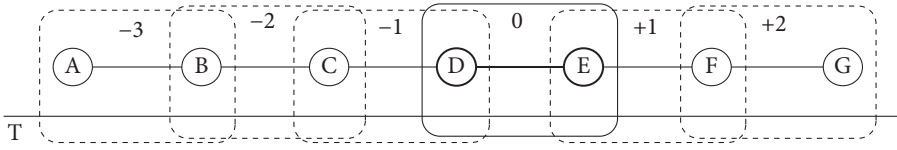

Figure 4. Coding a complex construction through windows of awareness, according to Langacker (2014: 27–28)

the structure is represented by the labels +1, +2, −1, −2 etc. The T arrow describes processing time.

Complement constructions correspond to layered mental space configurations where the matrix provides mental access to the complement. The way of accessing the content is part of the linguistic meaning of an expression; it interacts with lexical form and meaning. What I aim to show with the following analysis is that *pouvoir*$_{PM}$ and *pitää*$_{PM}$ each contribute to this unfolding of the complex meaning structure. They make explicit the incompatibility between the event expressed in the complement and the reality as projected by the speaker or the subject referent of the matrix. On a conceptual level, the matrix sets up the mental space framed by the epistemic or axiological limits beyond which the event coded by the complement clause goes.

3. Interplay with the lexical semantics of the matrix

Constructions conveying a so-called "effect of extraordinary" describe events that go beyond a discursively set epistemic or (deontic-)axiological limit (see Section 2.2). In a similar vein, PCCs found in the dataset of the present study can be divided into two groups, according to the lexical semantics of the complement taking predicate. Some of the matrices include lexical items referring to the truth value of the proposition, others contain evaluative expressions. The first type of matrix semantics will be labelled *going-beyond-epistemic-limits*, the second *going-beyond-axiological-limits*.

The studied verbs display a slight difference, when it comes to the type of lexical and modal items found most frequently in the matrix (see Table 1). *Pouvoir*$_{PM}$ occurs mostly in complement clauses whose matrix encodes epistemic modality, whereas the matrix of *pitää*$_{PM}$ carries more often axiological meaning and the distribution between the two meanings is more even. On the other hand, *pitää*$_{PM}$ is much less likely to occur with a negative matrix.

Table 1. The distribution of the occurrences of *pouvoir*$_{PM}$ and *pitää*$_{PM}$

The semantics of the matrix	***Pouvoir*$_{PM}$ (%)**	***Pitää*$_{PM}$(%)**
Going-beyond-epistemic-limits	207 (74.5)	41 (40.6)
Going-beyond-axiological-limits	71 (25.5)	60 (59.4)
Total	**278 (100)**	**101 (100)**
Negative	128 (46.0)	8 (7.9)
Positive	150 (54.0)	93 (92.1)
Total	**278 (100)**	**101 (100)**

The difference in distribution between *pouvoir*$_{PM}$ and *pitää*$_{PM}$ with regard to the proportion of epistemic and axiological matrices may in part be caused by the asymmetry in the French and Finnish dataset. Perhaps internet discussions as a text genre include more axiological expressions than literary dialogue. Another possible explanation, based on the different semantic origins of the two postmodal verbs, comes to the fore in the following sections where PCCs with *pouvoir*$_{PM}$ and *pitää*$_{PM}$ are analyzed more in detail.

3.1 *Pouvoir*$_{PM}$ and *pitää*$_{PM}$ as markers of going-beyond-epistemic-limits

The results presented above in Table 1 are interconnected. In both languages, negation co-occurs in PCCs mainly with a mental verb or some other expression of cognitive state or action. It is therefore not surprising that *pouvoir*$_{PM}$ is found more often than *pitää*$_{PM}$ in the complement of a negative matrix. Examples presented in (3) and (4), and reintroduced here, in (20) and (21), include a negative marker in the matrix.

(20) *C' est* ***in****croyable que la guerre* ***puisse*** *être*
EXPL be.3SG incredible COMPL ART.DEF war POUVOIR.SUBJ.3SG be.INF
finie.
finish.PTCP.PST
'It is **in**credible that the war **should** be over.' (Frantext, Torrès)

(21) *mitenkää* ***en*** *ois uskont*
no.way NEG.1SG AUX.COND believe.PTCP.PST
'there is **no** way I could have believed'
jot näiv vanhaaks ***pittää*** *elleä ku jäil leskeks*
COMPL this old.TRA PITÄÄ.3SG live.INF when stay.PRET.1SG widow.TRA
'that (one >) I **should** live this old when I became widow' (SA, Rautu)

In (20), the matrix contains an attributive construction including a deverbal adjective with a negative prefix (*incroyable* 'incredible'). Example (21) presents the negative form of the mental verb *uskoa* 'believe' in the perfect conditional. Affirmative matrices, on the other hand, contain items that describe surprise. Example (22) includes the verb *s'étonner* 'be surprised', whereas example (23) presents the adjective *kumma* 'unusual, strange'.

(22) *(---) des choses misérables de la vie, de celles qui sont tristes et sans importance.*
'(---) miserable things in life, those sad and unimportant ones.'
Mais pour Mélissa, ce sont des affronts.
'But for Melissa these are offenses.'
Elle s' *étonne* *avec vigueur que* *je* ***puisse***
3SG REFL surprise.3SG PREP strength COMPL 1SG POUVOIR.SUBJ.1SG
'She is highly surprised that I **should**'
trouver normaux les affronts, et sans importance.
'consider the offenses as normal, and unimportant.' (Frantext, Manchette)

(23) *Olisivat antaneet meidän pysyä maalla ja kierrellä,*
'They should have let us stay at the countryside and wander,'
on *se* *kumma, että* *niiden* ***pitää*** *raahata meidätkin*
be.3SG EXPL strange COMPL 3PL.GEN PITÄÄ.3SG drag.INF 1PL.ACC.CLT
armeijaan.
army.ILL
'it's unbelievable that they **should** drag us too to the army.'
(Literature, Baltzar)

PCCs with *pouvoir*$_{PM}$ and *pitää*$_{PM}$ express not only that the event described in the complement conflicts with the reality as projected by the speaker or the subject referent of the matrix, but also that the speaker or the subject referent is unprepared to the inclusion of the event in the sphere of what is real (on the range of mirative meanings, see Aikhenvald 2012: 437). They mark mirativity on two different levels. Certain PCCs include syntactic constructions that are more or less specialized in expressing surprise in their matrix. These constructions typically include grammatical and lexical expressions of affect, such as uncanonical word order, swearwords and discourse particles. This type of PCCs is more often found in the Finnish data. The matrix in example (23) deviates from the unmarked SVO word order, since the utterance-initial affirmative verb (*on* 'be.3SG') is followed by the expletive subject *se* (Hakulinen 1989: 59–60; Hakulinen et al. 2004: § 1386). Other PCCs, such as the one presented in (22), rather describe the surprised reaction of the subject referent (on mirative expressions and utterances in expressing and describing surprise, see Celle, Jugnet, Lansari & L'Hôte 2017).

In both languages, the difference between the categories of going-beyond-epistemic-limits and going-beyond-axiological-limits is subtle (see also Bres & Labeau 2013: 165–166). The distinction in this part of the analysis was made on the basis of the lexical meaning of the matrix in the most literal sense, in order to tease out the possible effects of the different modal backgrounds of *pouvoir*$_{PM}$ and *pitää*$_{PM}$. Yet, even in the case of the most straightforward lexical epistemic items, the constructions usually convey evaluative stance. In example (22) the astonishment described by the verb *s'étonner* 'to be surprised' conceals disagreement. In example (23) the speaker disapproves of the forced military service of Finnish Romani. This supports the non-compositional treatment of these patterns: alteration in the lexical properties of the matrix, namely between epistemic and axiological semantics, does not affect the overall mirative reading coinciding with expression of emotional attitude – most often disapproval, as shown in the next section (see also DeLancey 2012: 558).

3.2 *Pouvoir*$_{PM}$ and *pitää*$_{PM}$ as markers of going-beyond-axiological-limits

The discrepancy between what the speaker or the subject referent projects as the usual course of events and the event taking place motivates the uses of both *pouvoir*$_{PM}$ and *pitää*$_{PM}$ also in constructions where the lexical meaning present in the matrix is explicitly evaluative. The stance taken is in both languages most often negative, as shown in Table 2.

Table 2. Axiological uses of *pouvoir*$_{PM}$ and *pitää*$_{PM}$

Stance	***Pouvoir***$_{PM}$ **(%)**	***Pitää***$_{PM}$**(%)**
Negative	57 (80.3)	58 (96.7)
Positive	14 (19.7)	2 (3.3)
Total	**71 (100)**	**60 (100)**

Negative stance is present in the following two examples. The dialogue presented in (24) takes place in an apartment just after a burglary. The participant, whose reaction is described with a participial form of the emotion verb *blesser* 'to offend', makes manifest the expectations that the question addressed to him violates by referring to his knowledge of the appropriate way of behaving in a situation of this type. Example (25) reports the thoughts of the narrator in an embarrassing situation. It includes the evaluative adjective *paha* 'bad', referring to the state of mind of the speaker-narrator. The verb *sattua* 'to happen to' makes the contrast between an ordinary state of affairs and the situation in question salient.

(24) *– Vous n'avez touché à rien ?*
'– You haven't touched anything, right?'
– À rien, à rien, pensez donc, protesta Langrier,
'– Nothing, nothing, of course not, Langrier protested,'
sincèrement blessé que
sincerely offend.PTCP.PST COMPL
'sincerely offended by the fact that'
son interlocuteur ***puisse***
POSS.3SG interlocutor POUVOIR.SUBJ.3SG
'his interlocutor **should**'
penser le contraire. J'ai l'habitude, quand même !
'think the opposite. I'm used to this, after all!' (Frantext, Jonquet)

(25) *Eihän tämä hauskaa ollut minustakaan,*
'I did not find this pleasant either,'
käsivarret olivat katketa raskasta tyttöä hyssytellessäni ja
'my arms were almost breaking from carrying and hushing the heavy baby girl and'
mieleni oli hirveästi paha siitä, että
mind.POSS.1SG be.PRET.3SG terribly bad DEM.ELA COMPL
'I was terribly upset by the fact that'
Agnesin ***piti*** *sattua*
PROP.GEN PITÄÄ.PRET.3SG happen.to.INF
'Agnes **should** happen to'
juuri tätä surkeutta näkemään.
just DEM.PART misery.PART see.INF.ILL
'come and see this misery.' (FLC, Canth)

Examples (26) and (27) show two of the more marginal cases of positive astonishment. In (26), two friends are looking at a photo. The incongruity with regard to what is expected is made clear as the difference in beauty (and more implicitly in age) between the mother and her daughters is evoked. In (27), once again the verb *sattua* 'to happen to' foregrounds the accidental, unpredicted nature of events. The reported speaker comments on a happy event where she has managed to sell a cow thanks to an unexpected encounter.

(26) *– Quelle jolie photo, dit l'amie en arrêt devant. J'ai déjà vu cette personne…*
'– What a beautiful photo, my friend said and stopped. I've already seen this person…'
De laquelle de tes deux filles s'agit-il ?
'Which of your two daughters is it?'
– Ce n'est que moi, dis-je en riant, à trente-deux ans…
'– It's me, I said, laughing, at the age of thirty-two…'
L'amie, gênée, se confondait en excuses.
'The friend was embarrassed, offering profuse apologies.'

– *Pourquoi ?! Je suis ravie que*
why 1SG be.1SG delighted COMPL
'– Why?! I'm delighted that'
l'on ***puisse*** *me prendre*
INDEF POUVOIR.SUBJ.3SG 1SG take.INF
'someone **should** take me'
pour l'une de mes filles… qui sont beaucoup plus belles que moi.
'for one of my daughters… who are so much more beautiful than me.'
(Frantext, Chaix)

(27) *"Kyllä se oli somaa,*
PTCL EXPL be.3SG delightful.PART
'It was such a delightful coincidence'
että ***piti*** *sen Pirilän Fiinan*
COMPL PITÄÄ.PRET.3SG DET.GEN PROP.GEN PROP.GEN
'that Fiina Pirilä **should**'
sattua siihen",
happen.to.INF DEM.ILL
'happen to be there'
puhui emäntä itsekseen (---).
'said the wife to herself (---)' (FLC, Pakkala)

In all these examples, the subject positions themself in relation to something unexpected: in (24), 'thinking that the subject referent would touch things on a crime scene'; in (25), 'the friend Agnes coming to visit (at an inconvenient moment)'; in (26), 'being taken for one's daughter'; and finally, in (27), 'seeking to sell a cow and meeting the servant of a house where a new cow is needed'.

To recapitulate, the epistemic and axiological meanings merge in almost all PCCs with *pouvoir*$_{PM}$ and *pitää*$_{PM}$, but the choice of giving prominence to either epistemic or axiological dimension differs in the two verbs. According to Celle (2018), corresponding complement clauses (as well as *why*-questions) with the auxiliary *would* in English receive epistemic modality "fictitiously and provisionally" for evaluative purposes. Complement clauses (and *why*-questions) with *should,* on the other hand, are semantically more dependent on the modality of the matrix which indicates that the event is unexpected. The complement presents the event as imposing itself upon the subject (see also Arigne 2007: 4). Both *pouvoir*$_{PM}$ and *pitää*$_{PM}$ come closer to the postmodal uses of *should* than to those of the inherently retrospective and modally more autonomous *would*. However, the rest of the analysis demonstrates that the necessive meaning, also found in *should*, makes *pitää*$_{PM}$ more inclined to occur in overtly evaluative PCCs than *pouvoir*$_{PM}$.

4. Procedural meaning and interclausal cohesion

4.1 From modal possibility and necessity to postmodal asymmetrical relationships

Because of its origins as a modal verb of possibility, *pouvoir*$_{PM}$ profiles the position of the event with regard to what is conceptualized as real. More specifically, it gives prominence to the possibility of integrating in the sphere of what is projected by the speaker or the subject referent as real an event that, in the first place, does not belong in it. The meaning '**p** and not ¬**p**', based on a relation of contrariety, is salient in *pouvoir*$_{PM}$ and this explains the importance of epistemic lexical items and negation in the matrices of *pouvoir*$_{PM}$ complements. The focus is on the existence of **p** and the non-existence of its (expected) absence.

Instead of operating in terms of truth values, *pitää*$_{PM}$ profiles the presence of paradigmatic alternatives. As a modal necessive verb, *pitää* codes obligation where one or several alternatives **q**, preferred by the subject referent, are overridden by another potential alternative **p**, as in (28) where **q** is 'to stay' and **p** is 'to leave'.

(28) *Minun* ***pitää*** *lähteä (vaikka haluaisin jäädä)*
1SG.GEN PITÄÄ.3SG leave.INF although want.COND.1SG stay.INF
'I **must** leave (although I would like to stay)'

In *pitää*$_{PM}$, the intersubjective meaning of obligation is faded, but the coexistence of other, non-selected alternatives remains at the foreground. The meaning '**p** instead of $\mathbf{q}_1$, $\mathbf{q}_2$…' gives prominence to the uniqueness of the selected event. This accounts for the relatively high proportion of axiological lexical units in the matrices of *pitää*$_{PM}$ complements. The selected event is evaluated against other alternatives. This also explains the relatively recurrent occurrences of expressions of coincidence, such as the verb *sattua* 'to happen to', in the complement (see examples 25 and 27). Coincidence entails unintentionality and the equal potential for an alternative course of events to be selected.

In this sense, similarly to *should* in English (Arigne 2007: 4; Celle 2018), *pitää*$_{PM}$ construes the event as fatal: the event coded by the complement clause is inevitable, uncontrolled by the subject referent (and, potentially, brought about by the circumstances, made possible by an almighty power, or motivated by the instincts of an animate being; see Laitinen 1992: 237).[10] The uses of *pitää* as an expression of fatality are to be related with its century-old history as the verb of ritual, magical and religious directives (see e.g. its biblical use; *ibid.* 232–237).

10. See also Vetters & Barbet (2006: 195), for the use of the French necessive auxiliary *devoir* as "future of fatality".

As the already vague and procedural modal meaning of possibility or obligation is bleached, what remains in the postmodal meaning is a conceptual structure with two elements in an asymmetrical relationship (**p** and ¬**p**; **p** and $\mathbf{q_1}$, $\mathbf{q_2}$…). In postmodal complement auxiliaries, the meaning of possibility or necessity no longer operates on the level of the event as such but on the level of its representation (Arigne 2007: 4). They mark the distinction between the propositional content of the complement (i. e. the description of the event) and the treatment of the event as a discourse-old stimulus of the reaction expressed or described in the matrix.

Within the PCC, the postmodal verb gives linguistic form to the conceptual link between two units. It no longer activates the epistemic or root modal meaning but lends itself to marking semantic cohesion between units. As the meaning of the modal verb becomes more procedural, the auxiliary becomes "a relational strategy" (see Traugott 2015: 54) and, thanks to it, the cognitive-semantic link between the matrix and the complement gets tighter.

4.2 The evolution of *pouvoir*$_{PM}$ and *pitää*$_{PM}$ as relational strategies

The reanalysis of *pouvoir* and *pitää* into postmodal complement markers has taken place in very specific, partially substantive constructions. Given the different modal origins of the two verbs, the critical contexts (see Diewald 2006) for grammaticalization into postmodal complement items are likely to be different as well. For *pouvoir*$_{PM}$, referentially unspecific complements of epistemic matrices could have been the critical context triggering the evolution into postmodal complement item. The complement constructions exposed in examples (29)–(31) are organized from less procedural (modal) to more procedural (postmodal). By elucidating the interplay between lexical and grammatical elements within the PCC, they give us an idea of the constructional changes that may have taken place in PCCs with *pouvoir*$_{PM}$.

In (29), the matrix includes an overtly epistemic modal expression, the negated mental verb *penser* 'to think', and the epistemic modal meaning of *pouvoir*$_{PM}$ is easily retrievable on the basis of the conditional clause included in the complement. Moreover, as the subject of *puisse* is unspecific, the epistemic meaning of the auxiliary can be reanalyzed as a theoretical possibility. In more than 34% of the PCCs with *pouvoir*$_{PM}$, the subject position of the complement clause actually is occupied by an indefinite pronoun, most often *on* 'one'. The unspecific reference opens the way to the emergence of implicative reading: theoretical possibilities may have taken place.

(29) *Pour qu'un artiste fasse quelque chose,*
'In order for an artist to do something'
il faut qu'il soit environné de tout un terreau de gens.
'he has to be surrounded by a soil of people.'
Je ne pense pas que quelqu'un ***puisse*** *exister*
1SG NEG think.1SG NEG COMPL INDEF POUVOIR.SUBJ.3SG exist.INF
'I do not think anyone **can** exist'
s'il n'a pas ce terreau.
'if he does not have this soil.' (Frantext, Boltanski & Grenier)

In (30), the matrix verb is implicative and the subject of the complement is specific, but the content of the completive is still explicitly expressed as a theoretical possibility (*idée* 'idea'). In addition, the time adverbial *un jour* 'one day' opens up an unspecific interpretation.

(30) *Les mariés n' avaient pu*
ART.DEF marry.PTCP.PST.PL NEG AUX.IPF.3PL can.PTCP.PST
'The newly-weds had not been able to'
supporter l' idée
bear.INF ART.DEF idea
'bear the idea'
que leur bonheur ***puisse*** *prendre fin*
COMPL POSS.3PL happiness POUVOIR.SUBJ.3SG take.INF end
'that their happiness **should** come to an end'
un jour…
ART.INDEF day
'one day…' (Frantext, Ollivier)

Finally, in (31), the matrix includes an implicative axiological verb, the subject of the complement is specific and *pouvoir*$_{PM}$ alone marks the status of the complement as a theoretical possibility towards which the reaction expressed in the matrix is oriented.

(31) *[E]lle était en salle de réanimation depuis cinq mois,*
'She had been in a resuscitation area for five months,'
on l'a installée dans une chambre.
'they had put her in a room.'
Dans une sorte d'infantilisme, de refus
'In a kind of infantilism, refusing'
d' admettre que ma mère ***puisse***
PREP admit.INF COMPL POSS.1SG mother POUVOIR.SUBJ.3SG
'to admit that my mother **should**'

être atteinte d'un cancer, (---) je me mis à courir (---).
'be affected by cancer, (---) I started running (---).' (Frantext, Calle)

The following example further highlights the connection between an unspecific subject reference and *pouvoir*$_{PM}$.

(32) *Michel Foucault, dont j'étais sans nouvelles depuis assez longtemps, m'appelle avec gentillesse et tristesse: – Je pense à vous ce matin. Je voulais vous le dire. (---)*
'Michel Foucault, of whom I had not heard for quite a while, calls me with kindness and sadness in his voice: – I'm thinking of you this morning. I wanted to tell it to you. (---).'

Que Michel Foucault, qu' un Michel Foucault ***puisse***
COMPL PROP PROP COMPL ART.INDEF PROP PROP POUVOIR.SUBJ.3SG
'That Michel Foucault, that a Michel Foucault **should**'
penser à moi, un tel jour, et m' appeler
think.INF PREP 1SG ART.INDEF such day and 1SG call.INF
'think of me, on such a day, and call me'
m' étonne et m' émeut.
1SG surprise.3SG and 1SG move.3SG
'surprises and moves me.' (Frantext, Mauriac)

By operating on the paradigmatic axis of language use, the speaker-narrator uses a construction that resembles a self-repair in spoken interaction (see e. g. Schegloff 2007: 101). The association of a proper noun with an indefinite article turns a maximally specific reference ('the one person called Michel Foucault') into an unspecific reference to members of a category ('anyone sharing the discursively set properties of Michel Foucault') (see Riegel, Pellat & Rioul 2018: 339) and thus construes the event ('[someone like] Michel Foucault thinks of me') as a theoretical possibility. The time adverbial *un tel jour* ('on such a day') further implies an unspecific category of time points.

The different degrees from modal to postmodal meaning are already present in *pouvoir*$_{PM}$ occurrences found in the *Classical French* part of the *Frantext* database (written French from 1650 till 1799), as shown in examples (33–35). In (33), the form *puisse* is modal and non-implicative ('one cannot deny').

(33) *Or toutes les religions, et principalement la religion chretienne, posent pour fondement de leurs misteres et pour regle de leur doctrine et de leur morale, un principe d'erreurs, d'illusions et d'impostures; donc… etc.*
'All religions, and principally the Christian religion, take as the foundation of their mysteries and as the rule of their doctrine and moral a principle of errors, illusions and impostures; therefore… etc.'

Je ne vois pas que l'on ***puisse*** *nier*
1SG NEG see.1SG NEG COMPL INDEF POUVOIR.SUBJ.3SG deny.INF
'I do not see how one **can** deny'

la premiere proposition de cet argument, elle est trop claire et trop évidente pour pouvoir douter de la verité d'une telle proposition. Je passe donc à la preuve de la seconde proposition, qui est que la religion chrétienne prend pour règle de sa doctrine et de sa morale ce qu'ils appellent foi, c'est-à-dire une créance aveugle, (---).
'the first proposition of this argument, it is too clear and too obvious to doubt the truth of such a proposition. I thus proceed to discussing the second proposition, which is that the Christian religion takes as the rule of its doctrine and moral what they call faith, that is, a blind belief (---).' (Frantext, Meslier)

In (34), the event presented as going beyond epistemic limits is described as factual. This type of use appears to be particularly present in the natural philosophy literature of the Enlightenment where different ways of conceiving the physical world were contrasted.

(34) *(---) car dans l'un et l'autre cas il arrive que ce rayon qui tendoit droit, par exemple, du Soleil vers l'eau, fait un coude, se courbe, se rompt, (---):*
'(---) for in both cases it happens that this ray, which headed directly, for example, from the Sun toward water, bends, curves, is disrupted, (---):'

or comment est- il possible de
CONJ Q be.3SG EXPL possible PREP
'but how is it possible to'

comprendre qu' un rayon
understand.INF COMPL ART.INDEF ray
'understand that a ray'

puisse *estre courbé, ou rompu*
POUVOIR.SUBJ.3SG be.INF curve.PTCP.PST or disrupt.PTCP.PST
'**should** be bent, or disrupted'

de la sorte, si ce n'est quelque chose de corporel, ou materiel, si ce n'est, dis-je, un corps, qui en rencontrant un autre soit contraint de se detourner de son chemin ?
'in such a way, if it is not something corporal, or material, if it is not, I say, a body that when encountering another body is forced to deflect from its path?'
(Frantext, Bernier)

In (35), the meaning of 'going-beyond-axiological-limits' is lexicalized (*épouventer* 'to frighten', *admirer* 'to consider with surprise').[11]

(35) *On doit remarquer que la nature humaine est si foible, particulierement dans les femmes, et plus qu'en toute autre chose dans l'exercice de l'oraison, qu'il ne faut pas prendre pour des visions tout ce qui se presente à nostre imagination (---). Car j'ay vû des effets de ces imaginations qui m'ont épouventée et*

'It should be noted that the human nature is so weak, particularly in women, and especially when praying, that one must not take for visions all that presents itself to our imagination (---). For I have seen the effects of these imaginations that have frightened me and'

fait admirer que ces personnes
make.PTCP.PST consider.with.surprise.INF COMPL DEM.PL person.PL
puissent
POUVOIR.SUBJ.3PL
'made me surprised that these people **should**'
si fortement se persuader d'avoir vû ce qu'elles n'ont point vû.
'be so strongly convinced of having seen what they have not seen.'

(Frantext, Arnauld D'Andilly)

As for *pitää*$_{PM}$, referentially unspecific complements of matrices with evaluative lexical items may have been the critical context setting off the evolution into post-modal complement item. Examples (36)–(38) outline the different degrees of modal bleaching in *pitää*$_{PM}$ and, in doing so, represent the possible evolution of the procedural meaning. In (36), *pitää*$_{PM}$ expresses an obligation in the past. The habitual time reference construed by the adverbial *joka kuukaus* 'every month', as well as the description of the (unsatisfactory) result of the action that imposed itself point towards an implicative reading of *pitää*. In other words, the speaker not only had to dye their hair every month, they actually did it.

(36) *Eli mulla on aika tumman ruskeet hiukset ja*
'So I have pretty dark brown hair and'
mulla oli aijemmin punaset, mutta
'it used to be red before, but'
*ärsytti ku niitä **piti** olla värjäämässä*
annoy.PRET.3SG COMPL DEM.PL.PART PITÄÄ.PRET.3SG AUX.INF dye.INF.INE
'I was annoyed that I **had to** keep dying them'
joka kuukaus (---) eikä väri pysynyt varsinkaan latvoissa
'every month (---) and the color didn't stay, especially not at the ends'

(Suomi 24)

11. For the meaning of *admirer* in the Classical French, see TLFi, *s. v. admirer*, Étymol. et Hist. 2.

In (37), the meaning of obligation is faded as the action described by the infinitive construction *mennä V-mA-An* 'to go V-INF-ILL' (here, *mennä pila-ma-an* 'to go ruin-INF-ILL' > 'to end up ruining') construes the event as undesired and resulting from an unpredicted course of action (see Sivonen 2016). In other words, the agent was not aware of proceeding towards the unwished result (cf. the uses of the verb *sattua* 'to happen to' in examples 25 and 27). *Pitää*$_{PM}$ indicates that the event is evaluated against other, more desirable alternatives. Note that in (36) and (37) the complement displays zero subject. Hence, the subject reference remains open and renders the situation identifiable to anyone who should find themself in the described circumstances (see Laitinen 2006), although the specific context gives priority to the participant(s) referred to in the preceding clauses.

(37) *Rumina pidetyt rakennukset puretaan*
'Buildings considered as ugly are being demolished'
ja kappas vain, kolmenkymmenen vuoden päästä
'and surprise, surprise, thirty years later'
harmitellaan kun ***piti*** *mennä*
feel.sorry.PASS COMPL PITÄÄ.PRET.3SG go.INF
'they feel sorry for having ended up'
pilaamaan kulttuuriperintöä
'ruining cultural heritage' (Suomi 24)

The use of *pitää*$_{PM}$ displayed in (38) can be regarded as the final stage in the reanalysis of a modal auxiliary as a postmodal marker. The modal meaning of *pitää*$_{PM}$ is bleached to the point where another necessive verb can appear in the same clause (*joutua* 'to have to').

(38) *Kova onni, että hänen* ***piti*** *joutua*
hard luck COMPL 3SG.GEN PITÄÄ.PRET.3SG have.to.INF
'It's hard luck that he **should** have to'
tuolla tavoin elämäänsä viettämään.
'live his life in that manner.' (Literature, Pakkala)

As stated in Section 1.2, the diachronic data for *pitää*$_{PM}$ is limited and, for historical reasons, does not allow to take into account the uses specific to Eastern dialects. Yet, the search for *pitää*$_{PM}$ run in the Corpus of Old Literary Finnish (VKK, 1543–1809) resulted in detecting occurrences of complement patterns with *pitää* that could be regarded as conveying affect, namely astonishment. They consist of a negated mental verb in the matrix and a complement that includes the South-Western dialectal construction associating *pitää* in the preterite form with an infinitive in the instructive case (e. g. *ole-ma-n* 'be-INF-INSTR'), as in (39).

(39) [Alaviite saman luvun jakeen 7 kohtaan *HERra sinä olet minun yllyttänyt*]
Ei johonguhun syndijn / eli erhetyxeen / waan mielistymän saarnawircaan:
'[Footnote to the sequence *Lord you persuaded me* in verse 7 of the same chapter]
Not to sin / or to mistake / but to take pleasure in preaching:'
sillä ei hän olis usconut / että
for NEG.3SG 3SG AUX.COND.3SG believe.PTCP.PST COMPL
'for he would not have believed / that'
saarnamises ***piti*** ***oleman*** *nijn suuri waiwa.*
preaching.INE PITÄÄ.PRET.3SG be.INF.INSTR so big effort
'preaching **would** demand so much effort.' (VKK, Biblia 1642, Jer. 20)

However, this construction is essentially non-implicative and used for future reference (see Elsayed 2017).

The analysis highlights the importance of taking into account the pragmatic and morpho-syntactic (see Noël 2007, for a discussion) as well as lexical (Hilpert 2016) context where grammaticalization takes place. It also supports Cristofaro's (2008) noncompositional approach to complement constructions where complex structures are not seen as "formed by joining together smaller parts with prespecified meanings" but considered as a whole (see also Schmidtke-Bode 2014: 38–39). The investigated patterns convey mirative reading with affective (often negative) stance, regardless of the semantic variation in the (epistemic or axiological) lexical items of the matrix and the modal background of the postmodal auxiliary of the complement. The meaning of the postmodal complement item can only be understood by looking into the interaction between the units of a complex construction. The postmodal auxiliary crystallizes the semantic link between these units.

While the difference in the modal origins of and the grammaticalization paths taken by *pouvoir*$_{PM}$ and *pitää*$_{PM}$ results in different conceptualizations of the 'going-beyond-limits', the two verbs make a similar contribution to the unfolding of the chain-like complex construction formed by the two clauses. In cognitive semantic terms, postmodal complement items are explicit invitations to identify, in the immediate context, the appropriate sequence allowing to access the content of the complement. The mental space construed by the matrix and framed by the epistemic or axiological limits that are relevant in the situation provides the necessary conceptual framework for understanding the unexpectedness of the event coded by the complement. In this sense, the postmodal verbs bring to the fore the chain-like form of the linguistic structure. Figure 5, based on Langacker's (2014: 27–28) theory on the dynamic processing of complex constructions (see Section 2.2), locates the postmodal complement function within the conceptual chain. It zooms in the immediate scope of attention (the primary window) and shows the link to which the postmodal complement item gives linguistic form.

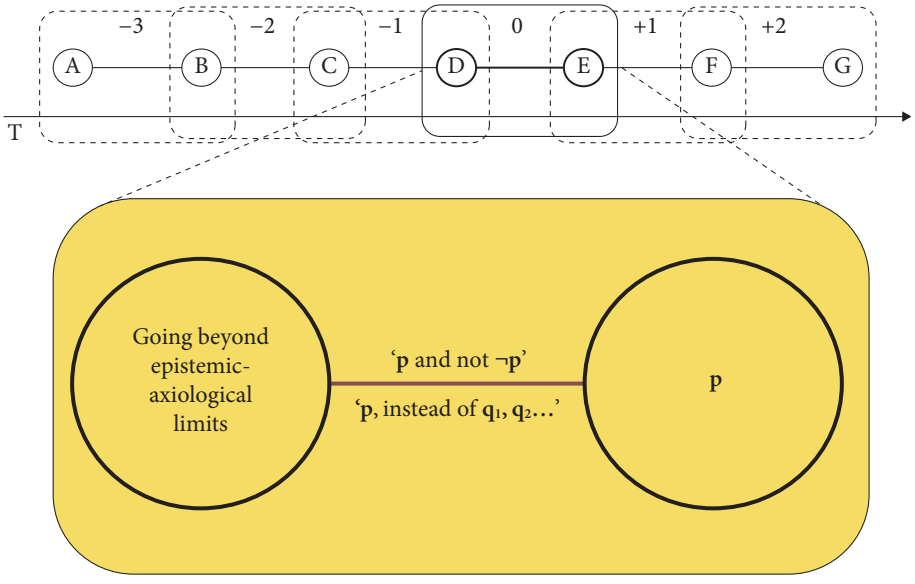

Figure 5. The function of postmodal complement items in the processing of complex constructions

5. Discussion

The analysis presented above and the English translations of the observed constructions have already shown that the postmodal use of a necessity verb in epistemic and axiological contexts is also present in English. Example (40) illustrates the complement use of the English *should*.

(40) *'Can I get you some coffee?' inquired the visitor.*
'Strange that you ***should*** *ask,' said Perera.*
(Corpus of Contemporary American English, cited by Celle 2018: 39)

Just like *should, pitää*$_{PM}$ can also occur in *why*-questions, as shown in (41).

(41) *Miksi noin hyvän ihmisen* ***piti*** *kuolla, (---).*
why DEM good.GEN person.GEN PITÄÄ.PRET.3SG die.INF
'Why **should** such a good person die (---),' (Suomi24)

Celle (2018) has shown that *should* functions in *why*-questions in a way comparable to complement clauses.

What is more important from a diachronic perspective is that, in its main clause and complement functions, the implicative *pitää*$_{PM}$ also resembles certain originally

necessive auxiliaries in languages neighboring Finnish (Laitinen 1992: 240; see also Laitinen 1997: 116), which gives reason to consider the possibility of a contact-induced evolution. The following examples include the Swedish *skola* in an exclamative clause (42a) and in the complement of an axiological expression (42b).[12]

(42) a. *Att det här **skulle** hända just nu!*
'(To think) that this **should** happen just now!'
b. *Det är synd, att han **skulle** vara sjuk just på sin högtidsdag.*
'It's a shame that he **should** be sick on his day of celebration.'
(SAOB, *s. v. skola*, 3 c *β*)

Laitinen (1988: 60–63) presents examples of Inari Sámi modal verb *kolgađ* used in implicative utterances expressing unexpectedness and discusses the possibility of Norwegian influence (cf. e. g. NAOB, *s. v. skulle*, 10.1.7). It is thus clear that Scandinavian and Finno-Ugrian languages neighboring each other have come to develop a similar postmodal use for necessive verbs.[13] However, the hypothesis concerning the Swedish influence in the evolution of the implicative *pitää*$_{PM}$ is difficult to confirm here. It is true that certain other uses of *pitää* (e. g. in verb constructions denoting future time) clearly result from contact with Swedish *skola*, but it has been shown that this has happened mainly in the context of establishing the Finnish written language (see Elsayed 2017). Yet, as discussed above, the implicative *pitää*$_{PM}$ conveying affect is not present in the oldest texts written in Finnish. Furthermore, if one assumes on the basis of its observed regional distribution in language data (see Section 2.1.) that the implicative *pitää*$_{PM}$ is of Eastern origin, it is unlikely that the grammaticalization into affective utterances is due to contact with Swedish, unless one also assumes that the affective use of the implicative *pitää*$_{PM}$ was once present in Western dialects as well, but disappeared before the time of Agricola (16th century). From a geographical perspective, influence from Russian would be more expected. Interestingly, the originally modal *nuzhno* ('be necessary') can be used in implicative sentences of the following type:[14]

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12. Concerning the contacts between *skola* and the non-implicative *pitää*, in view of early written Finnish, see Elsayed (2017).

13. As for the languages that are genealogically most closely related to Finnish, Kehayov & Torn-Leesik (2009: 375) state that the non-implicative reading of *pitää* seems to prevail in Balto-Finnic languages. However, the authors consider that, in view of the implicative reading displayed in Finnish dialects, the situation would deserve further investigation in the dialects of other languages as well. Concerning Finno-Ugrian languages beyond the Balto-Finnic group, apart from the already mentioned Inari Sámi *kolgađ*, at least Udmurt has developed comparable affective uses for a necessive item, namely *kule* 'must' (Svetlana Edygarova, p. c., 14 November 2019).

14. Evgeniya Gorshkova-Lamy and Thierry Ruchot (p. c., 16 October 2019).

(43) *Vot **nuzhno** bylo tebe suda!*
'(To think) that you **should** go there!'

An alternative to assuming a contact-induced change is to opt for a parallel evolution in Eastern Finnish *pitää*$_{PM}$, Inari Sámi *kolgađ*, Russian *nuzhno* and the forms deriving from **skal* in certain Germanic languages (e. g. Ringe 2017: 179). Affective utterances carrying mirative meaning (exclamatives, *why*-questions and complement constructions) may form a cross-linguistic critical context which triggers a grammaticalization process from necessive modal to postmodal meaning.

As stated above, *pouvoir*$_{PM}$ and *pitää*$_{PM}$ included in PCCs reflect the semantics of the matrix. They contribute to the modal cohesion of the construction. This type of complement constructions is known to be the birthplace of subjunctive markers (Bybee et al. 1994: 214): modal harmonization between the matrix and the complement is the first step in the evolution of a subjunctive form. This has happened to English *should* (*ibid.* pp. 214–218). The data of the present study suggest that in contemporary French the subjunctive mood alone is not always semantically strong enough to ensure modal cohesion. The subjunctive no longer carries root modal or epistemic meaning. It only indicates that the event described in the complement belongs to the same modal frame as the event expressed by the matrix. *Pouvoir*$_{PM}$, on the other hand, can combine with the subjunctive and reiterate the modal meaning of the matrix in the complement. In a sense, in this particular function, *pouvoir* has introduced itself in the complex life cycle of a subjunctive (van Gelderen 2009; cf. also Dahl 2001).

There is no dedicated subjunctive category in the Finnish verb system. The conditional, the potential and the jussive mood can be found in certain contexts typical of the conjunctive and the subjunctive in Germanic and Romance languages (Setälä 1887; Kauppinen 1998: 164; Peltola 2011). Certain subordinate non-implicative uses of *pitää*, such as the one presented in (44) (see also example 39 above), have also been compared to the Germanic conjunctive (Forsman Svensson 2016; Elsayed 2017). Some of them have come to Finnish texts through translation (*ibid.* p. 127).

(44) *eij hän [= Pietari] tahtonut Christuxen anda pestä hänen jalcoians,*
'he [= Peter] would not let the Christ wash his feet,'
sillä hän ajatteli, ettei
for 3SG think.PRET.3SG COMPL.NEG
'for he thought that'
*se **pitänyt** sowelias oleman*
DEM PITÄÄ.PTCP.PST appropriate be.INF.INSTR
'it **would** not be appropriate.'
(a sermon by Abraham Ikalensis, 1659, see Forsman Svensson 2016)

The implicative *pitää*$_{PM}$ occurring in PCCs is then one more example of the resources in the Finnish language to mark the semantic link between the constituents of a complex construction.

6. Conclusion

This paper explored the semantic motivation of the postmodal auxiliaries *pouvoir*$_{PM}$ and *pitää*$_{PM}$ in complement constructions conveying mirativity, as well as the grammaticalization path that has taken each of the two verbs beyond their modal uses. Both *pouvoir*$_{PM}$ and *pitää*$_{PM}$ occur in constructions expressing events that cross discursively set epistemic or axiological limits, but the meaning of unexpectedness is construed on different grounds. Stemming from a modal verb of possibility, *pouvoir*$_{PM}$ operates in terms of truth value and makes salient the meaning '**p** and not ¬**p**'. This is why the reanalysis of the modal *pouvoir* as a postmodal marker is likely to have begun in the complements of epistemic mental verbs, the context where *pouvoir*$_{PM}$ most often occurs in the present data. *Pitää*$_{PM}$, on the other hand, draws its origin from a modal verb of necessity. The procedural meaning '**p** instead of $\mathbf{q}_1$, $\mathbf{q}_2$…' establishes a paradigmatic relationship between the selected event **p**, which is factual but viewed as a theoretical possibility among others, and its unrealized alternatives $\mathbf{q}_1$, $\mathbf{q}_2$… The suggested starting point for the postmodal evolution of *pitää*$_{PM}$ are therefore complement constructions that include axiological lexical items and that serve to evaluate events.

The analysis aimed to contribute to our understanding of the interplay between the lexical and the grammatical components of a construction in the grammaticalization process. The paper focused on the different degrees of procedural meaning, showing the mechanism by which a modal marker can become part of a holistic unit as the index of an interclausal semantic link. The complement function of *pouvoir*$_{PM}$ and *pitää*$_{PM}$ was tackled from the point of view of the dynamics in the conceptual unfolding of a complex pattern. The postmodal complement auxiliaries were regarded as resources for giving linguistic form to the modal cohesion between the constituents of the construction. In this sense, they can be identified as early forms of subjunctive items.

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Abbreviations

ACC	accusative
ADE	adessive
ART	article
AUX	auxiliary
CLT	clitic
COMP	comparative
COMPL	complementizer
COND	conditional
CONJ	conjunction
DEF	definite
DEM	demonstrative
DET	determiner
ELA	elative
EXCL	exclamative
EXPL	expletive
GEN	genitive
ILL	illative
IMP	imperative
INDEF	indefinite
INE	inessive
INF	infinitive
INSTR	instructive
IPF	imperfect
NEG	negation
PART	partitive
PASS	passive
PL	plural
POSS	possessive
PREP	preposition
PRET	preterite
PROP	proper noun
PST	past
PTCL	particle
PTCP	participle
Q	interrogative
REFL	reflexive
SG	singular
SUBJ	subjunctive
TRA	translative

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Horizontal links within and between paradigms

The constructional network of reported directives in German

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This paper deals with the constructional network of reported directive speech acts in German. It addresses two aspects of modality and constructions by relating directly to questions raised in the introduction to this volume: the notion of the paradigm in Construction Grammar on the one hand and the nature of the links within the constructional network model on the other. By investigating the network of syntactic constructions of reported directives in German, the paper focuses on the modelling of two types of horizonal paradigmatic links between these constructions: the links between allostructions and the links between paradigmatic choices. On the conceptual level, the paper argues that these two types of paradigmatic links constitute two different types of horizontal links in the network. On the empirical level, the study demonstrates how these horizontal links manifest themselves in the corpus data.

Keywords: speech acts, reported directives, constructional network, horizontal links, allostructions, paradigmatic choices, paradigmatic organization, German

1. Introduction

It is generally known that there are two very broad areas of the domain of modality and modal meanings. On the one hand, there is a sub-domain of modality associated with the basic semantics of possibility and necessity wherein the notions of dynamic, deontic, etc. (= non-epistemic) and epistemic modality serve as the most prominent categories. On the other hand, there is the modal sub-domain of illocutionary distinctions, often called mood, which is associated with such categories as verbal mood, sentence types, etc. It is within this latter sub-domain of modality that the present study is situated. Namely, it deals with the expression of reported speech acts in German, more specifically, with the coding of reported directives, as opposed to reported statements, as exemplified in (1)–(2) below:

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(1) directive speech act — (Peter zu Anna:) ***Geh***$_{\text{IMP}}$ *bitte nach Hause!*
'(Peter to Anna): Please, go$_{\text{IMP}}$ home!'

> reported directive — *Peter bittet Anna, nach Hause **zu gehen**.*
Peter asks Anna home to go-INF
*Peter bittet Anna, **dass** sie nach Hause **geht**.*
Peter asks Anna that she home go-3SG.PRES.IND
*Peter bittet Anna, sie **soll** nach Hause **gehen**.*
Peter asks Anna she should home go-INF
'Peter is asking Anna to go home.'

(2) representative speech act — (Peter zu Anna:) *Ich gehe nach Hause.*
'(Peter to Anna): I am going home'

> reported statement — *Peter sagt, **dass** er nach Hause **geht**/**gehe**.*
Peter says that he home go-3SG.PRES.IND/SUBJ
*Peter sagt, er **gehe** nach Hause.*
Peter says he go-3SG.PRES.SUBJ home
'Peter says that he is going home.'

This paper aims at complementing previous work (Smirnova, 2017) by investigating corpus data from the New High German period (1600–1900) and by drawing more general conclusions with respect to theoretical modeling of paradigms and horizontal links in the constructional network. More specifically, the following points will be addressed in this study:

From the descriptive point of view, different construction types of reported directives exemplified in (1) and distinguished in the previous – more qualitatively oriented – work (cf. Smirnova, 2017) have so far been considered alternative means of expression of reported directives, i.e. 'allostructions'. In this study, these construction types will be analyzed more carefully with respect to their relative distribution and to their degree of prominence among each other. In doing so, particular attention will be paid to frequency. In addition, close attention will be paid to verb forms and verb classes used in complement clauses as well as to diachronic changes within these parameters.

From a more general point of view, the syntactic patterns of reported directives will be explicitly contrasted with the syntactic patterns of the reported statements briefly exemplified in (2). The question to be investigated is whether distinct formal properties may be attributed to these two groups of constructions that could consequently be resulting in them being considered two distinct paradigms of constructions.

From the theoretical perspective, the issue of paradigmatic organization of constructions in the network will be addressed. Using the constructional family of reported directives as an example, it will be shown that – in addition to vertical

inheritance links – there are (at least) two types of horizontal paradigmatic links to be distinguished between constructions. I will argue that these two types of horizontal links are essential for the organization of constructional networks.

The paper starts with a brief introduction of the research object, i.e. reported directives in German (Section 2). Section 3 will present the theoretical framework for distinguishing two types of horizontal links in the constructional network by relating to some recent developments in (Diachronic) Construction Grammar. German reported directives will be modelled as a paradigm of constructions linked to each other by vertical and horizontal links. Section 4 will present the data on which the study is based and introduce the relevant annotation variables. Section 5 is devoted to the discussion of the most relevant results of the corpus study. Section 6 concludes and offers some thoughts on possible avenues for further research.

2. Reported directives in German

The present study deals with sentence types, a domain of modality which is usually associated with mood distinctions. In this paper, I rely on the following definitions of the notion *sentence type*, which are very closely connected to the traditional typology of speech acts going back to Austin and Searle:

> The speakers of any language can accomplish a great many communicative tasks with the sentences of their language: they can start a conversation, order someone to do something […] For some of these uses of sentences a language will have specific syntactic constructions, or even specific forms, reserved for just these uses […]. Such a coincidence of grammatical structure and conventional conversational use we call a SENTENCE TYPE. (Sadock & Zwicky, 1985, p. 155)

> Such a combination of grammatical structures – phonological, morphological, or syntactic – marking the type of communicative act or "speech act" of the utterance is called a "sentence type" or, in yet other terminology, a "mood". (Aikhenvald, 2016, p. 141)

These definitions, albeit ones proposed outside the framework of constructionist approaches, are perfectly compatible with the constructionist view. Both definitions refer to a sentence type as a conventionalized pairing of form, i.e. "phonological, morphological, or syntactic" in the definition by Aikhenvald (2016) or "specific syntactic constructions" in the wording of Sadock and Zwicky (1985), and meaning, i.e. "type of communicative act" (Aikhenvald, 2016) or "communicative tasks" (Sadock & Zwicky, 1985). The present study explicitly takes constructionist perspective on this phenomenon and approaches (reported) sentence types in terms of constructions.

Generally, a distinction is made between three basic universal sentence types (cf. e.g. Sadock & Zwicky, 1985; König & Siemund, 2007; Aikhenvald, 2010, 2014, 2016):

- statements, which are associated with the declarative or indicative mood, see e.g. (3);
- commands, usually associated with the imperative mood, see e.g. (4); and
- questions, which are associated with the interrogative mood and various types of question marking, see e.g. (5).

(3) statements ≈ indicative
*Peter **is** my brother.*

(4) commands ≈ imperative
***Go** away!*

(5) questions ≈ interrogative
***Is** Peter my brother? **Who** is Peter?*

The present study deals with a special sub-group of sentence types, namely with constructions which serve to introduce reported speech acts, which in the German linguistic tradition have been called *Indirektheitstypen* ("types of indirectness", see e.g. DUDEN, 2016; Eisenberg, 2006; Meibauer et al., 2013; Pittner, 2013; Axel-Tober, 2013).[1]

Reported sentence types are thus specific syntactic combinations of complement-taking predicates (henceforth: CTP) with complement clauses, which serve primarily to report statements, commands, and questions. These combinations will be treated here as constructions and conceived of as syntactic patterns with a dedicated function, namely to report the basic sentence types. In this respect, I adopt the view explicitly advocated by Cristofaro (2003, 2008) who treats combinations of CTPs with particular complement clause types as constructions (see esp. Cristofaro, 2008 for detailed discussion).

For German, two *Indirektheitstypen* in the sense introduced above have long been recognized and are by now undisputed. Statements are typically reported by a syntactic structure in which a CTP of utterance like *sagen* 'say' is combined with a verb-final complement clause introduced by the complementizer *dass* 'that'; the finite verb may be in the indicative or in the present subjunctive form, see e.g. (6).

1. Note that if the word *indirect* is used within the term "indirect speech", it refers to the fact that the speech act is reported (= the sense intended here). However, if *indirect* is used in the term "indirect speech act", it refers to the fact that the intended illocutionary act is not expressed directly, but by another speech act, from which the intended act has to be inferred (e.g. indirect imperative by request *Could you close the window?* instead of direct imperative *Close the window*). To avoid any misunderstandings that may arise due to the ambiguity of the term *indirect*, I will use the term *reported* instead of *indirect* throughout this paper.

(6) reported statements
[CTP$_{utt}$ + [*dass* … V$_{ind/pres.subj}$]]
Peter ***sagt***$_{CTP}$, *dass Anna nach Hause geht*$_{ind}$/*gehe*$_{pres.subj}$.
'Peter says that Anna is going home.'

Reported questions, on the other hand, are usually introduced by a CTP with interrogative semantics, for example *fragen* 'ask', and the complement clause typically contains the complementizer *ob* 'if' for yes/no-questions, see (7a), or question words like *warum* 'why' for *wh*-questions, see (7b).

(7) a. reported yes/no-questions
[interrogative CTP + [*ob* … V$_{ind}$]]
Peter ***fragt***$_{CTP}$, *ob Anna nach Hause geht*$_{ind}$.
'Peter asks if Anna is going home.'
b. reported *wh*-questions
[interrogative CTP + [*wh-* … V$_{ind}$]]
Peter ***fragt***$_{CTP}$, *warum Anna nach Hause geht*$_{ind}$.
'Peter asks why Anna is going home.'

It should be noted at this point that the linguistic expression of reported statements and questions in German is not limited to the syntactic structures just described. These prototypical structures are presented here mainly for illustration purposes. In Section 3, reported statements illustrated in (2) and (6) will be described in more detail and contrasted with reported commands, which constitute the main focus of this study.

In contrast to reported statements and reported questions, reported commands and more generally reported directives[2] have only rarely been mentioned in the literature. One notable exception is Breindl (1989), who briefly mentions: "indirekt wiedergegebene Imperativsätze werden meist als Infinitivphrasen oder als unselbständige Verbzweitsätze realisiert" (Breindl, 1989, p. 251).[3] In a previous study, I argued for the existence of reported directives as a particular sentence type of German and suggested that this sentence type is represented by three different construction types or constructional sub-schemas, which are basically formed by a combination of a directive CTP in the matrix clause with a particular type of complement clause (see Smirnova, 2017, pp. 250–264 for detailed discussion). The complement clause

2. Here and in the following, the more general term *directive* or *directive speech act* will be preferred to the narrower term *command*, as the constructions under investigation are not limited to the expression of orders and commands, but are generally used to report directive speech acts, including e.g. requests, invitations, suggestions and recommendations.

3. "Indirectly reported commands are mostly realized as infinitive phrases or as dependent verb-second clauses" (my translation).

combining with a directive CTP may be of one of the following syntactic types: *zu* 'to'-infinitive complement clauses, as illustrated in (8a), and dependent verb-second complement clauses, see (8b), are two possible complement clause types, as was rightly mentioned by Breindl (1989). Additionally, verb-final clauses with *dass* 'that' can be used as complements of directive CTPs, see (8c). As regards the morphology of the finite verb in the complement clause, it may occur either in the indicative or in the (present) subjunctive form.

(8) Reported directives
   a. [CTP_{dir} + [… V*zu*-inf.]]
   Peter ***bittet***$_{\text{CTP}}$ *Anna, einen Brief* <u>*zu schreiben*</u>$_{\text{inf}}$
   'Peter asks Anna to write a letter.'
   b. [CTP_{dir} + [$\text{V2}_{\text{ind/pres.subj}}$]]
   Peter ***bittet***$_{\text{CTP}}$ *Anna, sie* <u>*soll*</u>$_{\text{ind}}$/ <u>*solle*</u>$_{\text{pres.subj}}$ *einen Brief schreiben*.
   'Peter asks Anna (that) she should write a letter.'
   c. [CTP_{dir} + [*dass …* $\text{V}_{\text{ind/pres.subj}}$]]
   Pater ***bittet***$_{\text{CTP}}$ *Anna,* <u>*dass*</u> *sie einen Brief* <u>*schreibt*</u>$_{\text{ind}}$/<u>*schreibe*</u>$_{\text{pres.subj}}$.
   'Peter asks Anna that she write a letter.

In the next section, different syntactic patterns employed to report directive speech acts in German will be modelled from the constructionist perspective. In doing so, a first attempt will be made to represent the syntactic patterns in terms of a constructional network containing vertical and horizontal links within it.

3. Reported directives as a constructional network: Vertical and horizontal links

In the constructionist approaches to language structure, it is a generally acknowledged fact that constructions are organized in structured inheritance networks of various sizes, often called constructional families. It is assumed that the nodes of the network are formed by individual constructions or construction types, and that there are links between the nodes. The links between nodes are said to hold in the vertical and horizontal dimensions of the network. Regarding the theoretical modeling of these relations, several classifications have been proposed in the literature, and in recent years, there has been growing interest in modeling horizontal relations (see Smirnova & Sommerer, 2020 for an overview of the most recent approaches). In the following section, I will briefly introduce some concepts which primarily concern the paradigmatic organization of the constructional network.

Figure 1 is meant to represent a simplified model of a constructional network with vertical inheritance links. The higher levels of the hierarchy host more

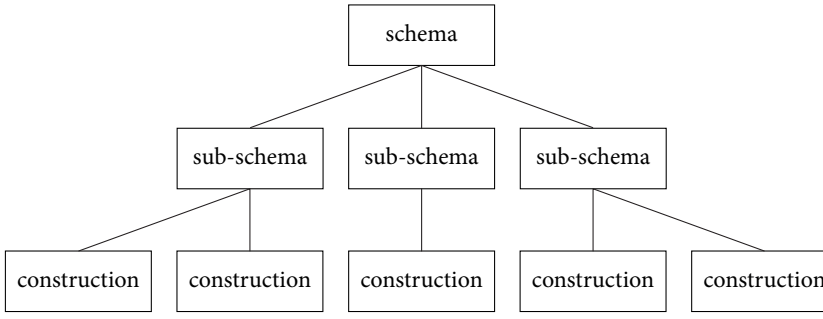

Figure 1. Simplified model of a constructional network with vertical inheritance relations

schematic construction types or schemas, whilst the fully specified construction types are located on the lowest level. Note that there can be multiple intermediate schematicity levels in the hierarchy, rendering several levels of constructional sub-schemas possible. Vertical inheritance links model and visualize the idea that the information from the highest node or most abstract schema is inherited by the nodes lower down in the hierarchy, i.e. sub-schemas and construction types. The constructional family of reported directives introduced in Section 2 can be represented in terms of a hierarchically organized constructional network, see Figure 2.

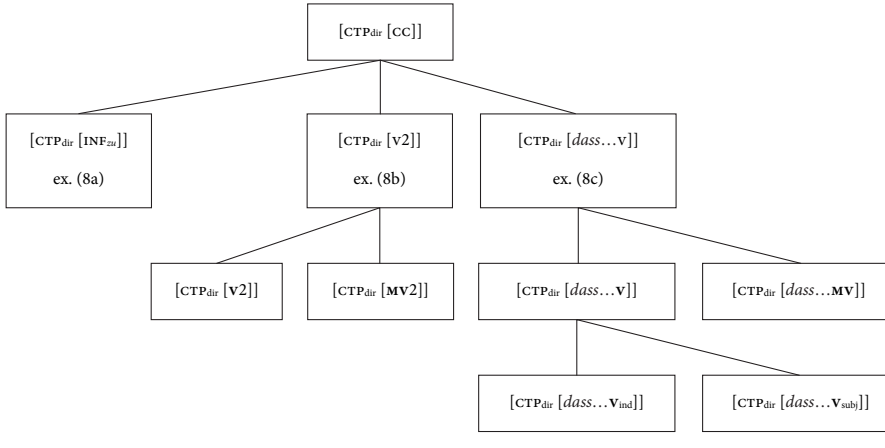

Figure 2. Constructional network of reported directives: Vertical inheritance links [CC=complement clause, MV=modal verb, V=full verb, V2= verb second clause]

The abstract complementation pattern [CTP_{dir} [CC]] is located on the most schematic level. It is constituted by a complement-taking predicate CTP_{dir} in the matrix clause and a (non-specified) complement clause CC. This abstract schema encodes only those elements that are shared by all constructions further down in the

hierarchy; the constructions on the lower levels specify those details which make them differ from each other. This complex schematic pattern may also be said to inherit its properties from some other, even more schematic syntactic constructions of German, for example a more abstract and schematic combination of a main clause and an embedded clause.

More specific construction types are situated on the lower levels in the hierarchy. On the level directly under the most general schema [CTP$_{dir}$ [CC]], three patterns introduced in Section 2 are located: the pattern with the non-finite clause [CTP$_{dir}$ [INF$_{zu}$]], the structure with the dependent verb-second clause [CTP$_{dir}$ [V2]], and the structure with the verb-final clause introduced by the complementizer *dass* 'that' [CTP$_{dir}$ [*dass*…V]].

As finite complement clauses may be further differentiated with respect to the sub-class and inflectional properties of the predicate, further lower levels hosting even more specific constructions may be posited in the network, e.g. where the predicate is specified as a modal verb (=MV) or as a full verb in the indicative (= V_{ind}) or in the present subjunctive form (= V_{subj}). Since the existence of the vertical inheritance links is uncontroversial, and because the main focus of the present study is on horizontal connections within a network of constructions, I will not go into more detail at this point and refer, instead, back to my previous study (Smirnova, 2017).

Horizontal links are usually described as connections which exist between "constructions at the same level of abstractness" (Diessel, 2015, p. 414; Hilpert & Diessel 2016, pp. 60–61). A closer look at some recent attempts to model these connections reveals, however, that the intuitively simple and appealing term *horizontal* has been subject to many different, sometimes conflicting interpretations.[4] I will focus on two approaches or rather groups of approaches to horizontal relations which are of particular relevance for the present study.

On the one hand, there are approaches that go back to Cappelle (2006), who proposed to conceptualize horizontally related constructions in terms of 'allostructions', the term being obviously based on the traditional morphological concept of 'allomorph'. The general idea is that constructions which display some differences in form – yet share the same meaning – are vertically connected to a higher-level schema, which is often termed a 'constructeme'. The allostruction view on horizontal links has been adopted, for example, by Perek (2015), Percillier (2020), Zehentner (2018), and Zehentner & Traugott (2020). The central idea is that

4. I will not consider here interpretations which are based solely on syntagmatic grounds, e.g. subpart links (Goldberg, 1995) or patterns of cooccurrence such as collocations (see e.g. Budts & Petré, 2020)

allostructions display shared semantic and formal features, but still differ in various construction-specific features which are not part of the 'constructeme'.

On the other hand, there are approaches where horizontal links are understood in terms of different choices in a paradigm, in a similar manner to the cells in an inflectional paradigm in morphology. According to this view, constructions that are connected by horizontal links do share some general meaning, but are at the same time opposed to each other in terms of their function (see esp. Van de Velde, 2014). Whilst some shared semantic component is guaranteed, no semantic similarities are postulated at the same level of abstraction.[5]

In the literature, these two approaches are sometimes presented as being closely connected to each other (see e.g. Diessel, 2019, Chapter 10; Zehentner & Traugott, 2020), due to the fact that they both use the term "horizontal" when describing and modeling links within a constructional network. I believe however that these two approaches should be clearly distinguished from each other, as they highlight distinct relations between constructions, and thus model horizontal relations of different types. It may be the case that, for a specific phenomenon, only one of the proposed types, i.e. either the 'allostruction' type or the 'paradigmatic choice' type of horizontal relations, will be relevant; a particular construction type may then be fully accounted for by considering only one type of horizontal relations to its neighbors in the network (see e.g. Audring, 2019). In other cases, however, and I strongly believe that this will be the case in most cases of constructional families and networks, both types of relations will be simultaneously present and will thus be relevant for such a modelling.

Taking nominal inflection in German as an example, the views presented above can be briefly illustrated as follows. German nouns can take several different plural forms, depending on many factors, such as inflectional class, phonological properties etc., see, for example, Table 1. The traditional minimal pair analysis, as it is introduced in a simplified form in Table 1, segments (at least) six different morphs which can serve to mark plural, one of them being a zero-morph {ø}. These six forms are considered allomorphs with the shared function PLURAL. The relation between these six allomorphs in the right-hand column in Table 1 corresponds to the horizontal connections between 'allostructions' introduced above.

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5. In a similar vein, but with rather different implications, Diewald (2015; 2020, Diewald & Smirnova, 2012) proposes to treat a grammatical paradigm itself as a particular type of construction, a 'hyper-construction'. This type of construction constitutes a separate node type within the constructional network. Within a paradigm conceived of in this way, there are vertical and horizontal links: vertical links are relations between a zero-marked cell and the marked constructions; horizontal links are oppositions between sister cells.

On the other hand, each of these six plural forms is opposed to its respective singular form, represented by the minimal pairs in the first and the second column in Table 1. The unmarked singular forms and the marked plural forms are in paradigmatic opposition to each other, thus exemplifying the 'paradigmatic choice' view on horizonal connections.

Table 1. Nominal inflection in German: Plural allomorphs

minimal pair **singular : plural**	**morphemes** **singular : plural**	**plural allomorphs** **[N -x]/ PL**
Kind : Kinder	{ø} ⟺ {er}	{-er}
Schaf: Schafe	{ø} ⟺ {e}	{-e}
Bett : Betten	{ø} ⟺ {en}	{-en}
Auto : Autos	{ø} ⟺ {s}	{-s}
Kiste : Kisten	{ø} ⟺ {n}	{-n}
Fenster : Fenster	{ø} ⟺ {ø}	{ø}
	≈ 'paradigmatic choice' view	≈ 'allostruction' view

Though this representation oversimplifies many aspects of the phenomenon, it may well illustrate the basic idea behind the two views on horizontal links. The important point is that whereas the 'allostruction' view focuses on shared properties of constructions, here the function PLURAL, the 'paradigmatic choice' view emphasizes the differences between them, here the functional opposition SINGULAR ⟺ PLURAL. More specifically, the 'allostruction' view focuses on correspondences between individual constructions, in this instance several plural forms, which represent paradigmatic alternations and are semantically close to each other (and can be considered synonyms, at least to some degree). The 'paradigmatic choice' view, on the other hand, focuses on correspondences between *pairs of* constructions, here the singular vs plural forms of the same noun, which represent paradigmatic choices and are in semantic opposition to each other (and can be considered minimal pairs).

Figure 3 "translates" the aforementioned relations in the German nominal inflection into a (partial) constructional network model. On the lowest level, four of the plural allomorphs are represented (the number has been reduced for practical reasons); horizontal links between them are indicated by the dashed lines. These constructions are vertically connected to a higher-level morphological schema [NOUN [–X]] which guarantees their shared functional properties. On this level in the constructional network, the plural schema [NOUN [–X]] is horizontally connected to the singular schema [NOUN [–ø]]. This type of horizontal connection, however, is of another type, i.e. of the 'paradigmatic choice' type, since it is basically constituted by the functional opposition between the singular and the plural forms.

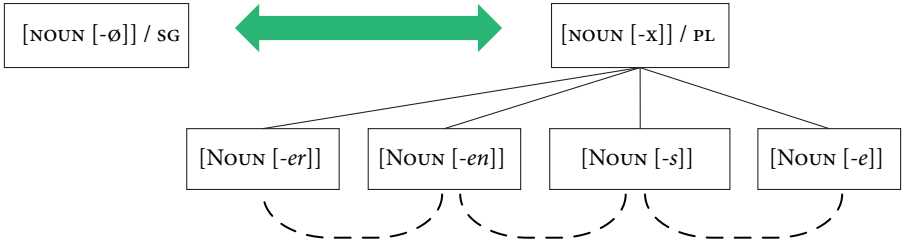

Figure 3. (Partial) constructional network of German nominal number marking: Horizontal links

At this point, it has to be kept in mind that the horizontal relation between the singular schema [NOUN [–ø]] and the plural schema [NOUN [–x]] is not due to the existence of some further higher-order schema, but is generalized bottom-up from the pairwise contrasts of constructions from the lower levels in the hierarchy.

Following the same line of reasoning, and as a first step towards modelling the constructional network of reported directives, Figure 4 builds on the network in Figure 2 above, by adding horizontal connections between individual constructions, conceptualized here in terms of 'allostructions'.

As can be seen in Figure 4, horizontal links between constructions on the same level of abstraction (represented by dashed lines) may exist on different levels of the hierarchy. On the most schematic level, for example, the complementation patterns with *dass*-clause [CTP$_{dir}$ [*dass*…V]], with verb-second clause [CTP$_{dir}$ [V2]] and with *zu*-infinitive [CTP$_{dir}$ [INF$_{zu}$]] are alternatives or 'allostructions' with regard to each other, as they all share the same general meaning and are used to report a directive speech act, see (8a–c).

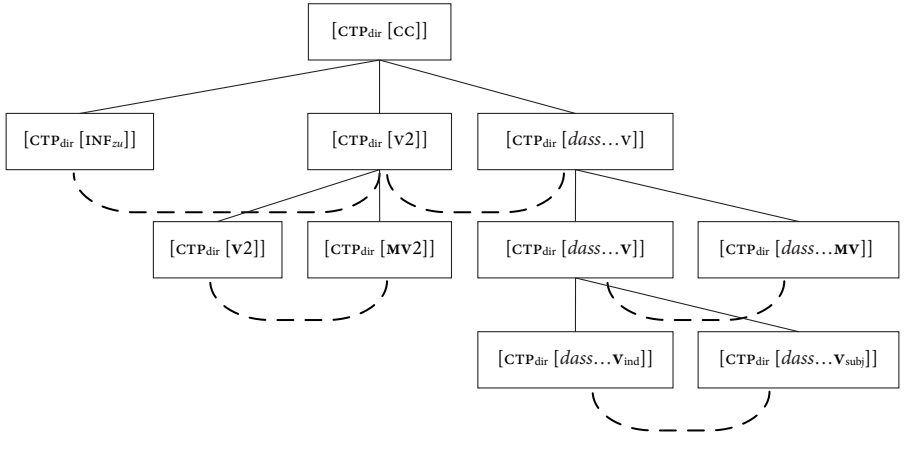

Figure 4. Constructional network of reported directives: Horizontal links

Descending further down in the hierarchy, similar connections may be posited between e.g. two variants of the pattern with a dependent verb-second clause, [CTP$_{dir}$ [V2]] with a full verb in the second position, and [CTP$_{dir}$ [MV2]] with a modal verb in the second position; the same can be said for the relation between the variants with the complement clause with *dass*, i.e. [CTP$_{dir}$ [*dass*…V]] and [CTP$_{dir}$ [*dass*…MV]]. In each case, the meaning of the syntactic structure remains more or less the same. That is, constructions alternate with each other and may be substituted by each other without great semantic difference. Importantly, this type of connection is crucially dependent on the schema abstraction in the vertical dimension of the network, which in each case guarantees the shared properties between the alternating constructions.

To illustrate the second type of horizontal connections, i.e. the 'paradigmatic choice' type, I will use the constructions of reported statements as a contrasting case (see Figure 5). It should be noted, however, that in each case, several complementation patterns are available (see Section 3), and only some of them have been selected for illustration purposes here.

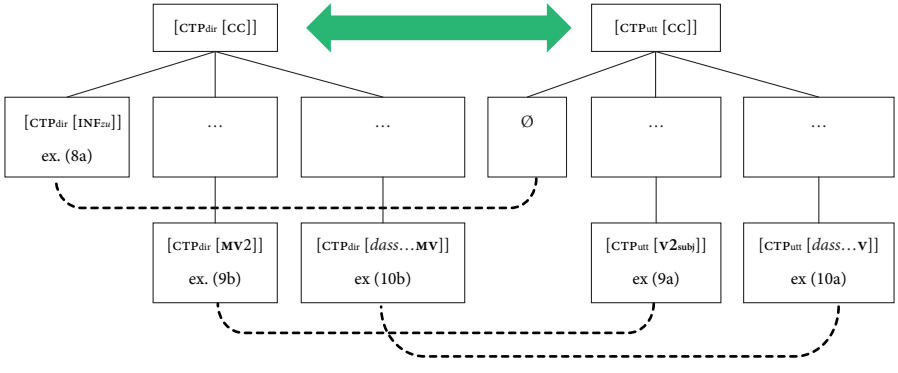

Figure 5. Constructional network of reported directives, contrasted with reported statements: Horizontal links

On the highest level of abstraction in Figure 5, the most schematic patterns [CTP$_{dir}$ [CC]] with a directive complement-taking verb and [CTP$_{utt}$ [CC]] with a complement-taking verb of utterance (= CTP$_{utt}$) are contrasted with each other in precisely the same way in which singular and plural morphological patterns were contrasted in Figure 3 above. Crucially, this contrast is motivated by the lower levels of the constructional hierarchy. On the level just below the two general complementation patterns, the non-finite clause contrasts with a zero or a non-existent

construction,[6] as a non-finite clause is not an option when reporting a statement in German (see Section 5.2 for details).

Descending further down in the hierarchy, we find more specific constructions which might be taken to constitute minimal pairs in the sense introduced above. For example, the more schematic pattern with a dependent verb-second clause (V2) can be observed in both reported statements and reported directives, but there is a contrast with respect to the class of verb: whereas a finite main verb in the present subjunctive form is the preferred form in reported statements, reported directives obligatorily select a modal verb in present-day German (see Section 5.2 for details), cf. (9a–b):

(9) a. reported statement with dependent verb-second clause
Peter ***sagt***$_{\text{CTP}}$, *Anna* *schreibe*$_{\text{subj}}$ *einen Brief*.
'Peter says (that) Anna writes a letter.'
b. reported directive with dependent verb-second clause
Peter ***bittet***$_{\text{CTP}}$ *Anna, sie* *soll*$_{\text{ind}}$ / *solle*$_{\text{pres.subj}}$ *einen Brief schreiben*.
'Peter asks Anna (that) she should write a letter.'

Moreover, although the complementation pattern with *dass*-clause is indeed possible in both cases, the modal verb can only be used in reported directives and not in reported statements, see (10a–b). If a *dass*-clause with a modal verb is used in combination with a matrix verb of utterance, the whole structure may only be interpreted as a reported directive, not as a reported statement.

(10) a. reported statement: *dass*-clause
Peter ***sagt***$_{\text{CTP}}$, *dass Anna er einen Brief* *schreibt*.
'Peter says (that) Anna is writing a letter.'
a′. (intended) reported statement with *dass*-clause and a modal verb *sollen*
=> reported directive
Peter ***sagt***$_{\text{CTP}}$, *dass Anna er einen Brief* *schreiben soll*.
'Peter says (that) Anna should write a letter.'
b. reported directive: *dass*-clause
Peter ***bittet***$_{\text{CTP}}$ *Anna, dass sie einen Brief* *schreibt/ schreiben soll*.
'Peter asks Anna (that) she should write a letter.'

6. The term ø "zero" in Figure 5 is meant to represent the fact that there is no corresponding regular construction with *zu* 'to'-infinitive in the realm of reported statements, that is, one cannot say **Peter sagte Anna, nach Hause zu gehen* to report an assertive speech act. That is, "zero" symbolizes a non-existence, a "hole" in the constructional network, which is only "visible" due to the existence of the corresponding construction in the category of reported directives. Importantly, the word "zero" in Figure 5 does not correspond to a "zero-morpheme" in Table 1, where a "zero-morph" may be and has been attributed particular semantics, i.e. singular and/or plural.

I would like to emphasize at this point that the horizontal relation between the most schematic constructions [CTP$_{dir}$ [CC]] and [CTP$_{utt}$ [CC]] is not due to the existence of some additional higher-order schema, but is generalized bottom-up from the pairwise contrasts of constructions from the lower levels in the hierarchy (i.e. by the horizontal connections which are indicated by the dotted lines in Figure 5). Within each pair of contrasted constructions, there is a correspondence that can be described in terms of opposition and choice; each pair constitutes a minimal pair with the contrasting semantic values "reported statement" and "reported directive". It is due to these multiple correspondences between pairs of constructions that a horizontal link is abstracted to a more general level, i.e. between the schematic constructions [CTP$_{dir}$ [CC]] and [CTP$_{utt}$ [CC]].

In the following sections, the proposed constructional network, in particular the proposed conceptual distinction between two types of horizontal connections between constructions, will be investigated using corpus data from the time period between 1600 and 1900. It will be demonstrated that it is possible to observe and detect diachronic processes of emergence and strengthening of horizontal connections of the two types described above in the diachronic corpus data.

4. Data

The study is based on corpus data from the DTA corpus (deutschestextarchiv.de) which covers the New High German data between 1600–1900. Tokens were extracted from the corpus using the lemma search for the following sixteen CTPs, i.e. eight directive verbs given in (11) and eight utterance verbs given in (12):

(11) CTPs of order and command (= directive verbs):
befehlen 'order', *bitten* 'ask', *empfehlen* 'recommend', *erlauben* 'allow', *gebieten* 'demand', *gestatten* 'permit', *raten* 'advise', *verbieten* 'vorbid'

(12) CTPs of utterance (= assertive, representative):
antworten 'answer', *behaupten* 'claim', *erklären* 'explain, declare', *erwähnen* 'mention', *erzählen* 'report', *meinen* 'mean', *sagen* 'say', *schreiben* 'write'

The choice of the verbs was motivated by the two following considerations: (i) it is the prototypical representatives of German CTPs that serve to express and introduce representative and directive speech acts (see e.g. the lexicon of communication verbs by Harras (2004) and the grammatical description of indirect speech (DUDEN, 2016, p. 534–550); (ii) in the DTA corpus, they are well represented and attain a token frequency of more than 5000, this being important for comparability reasons (see Table 2).

Table 2. Overall token frequency of the analyzed CTPs in the DTA corpus (U = verb of utterance, D = directive verb)

VERB	SEM	RANK	TOKEN FREQ	VERB	SEM	RANK	TOKEN FREQ
sagen 'say'	U	6	218,538	*erlauben* 'allow'	D	186	13,453
schreiben 'write'	U	31	56,718	*erwähnen* 'mention'	U	192	12,517
erklären 'explain'	U	58	34,572	*befehlen* 'order'	D	205	11,916
meinen 'mean'	U	65	32,231	*verbieten* 'vorbid'	D	279	9,626
erzählen 'tell'	U	87	25,274	*gestatten* 'permit'	D	311	8,595
bitten 'ask'	D	93	24,696	*empfehlen* 'recommend'	D	376	7,162
antworten 'answer'	U	107	21,256	*gebieten* 'demand'	D	406	6,528
behaupten 'claim'	U	128	17,865	*raten* 'advise'	D	456	5,667

As can be seen from Table 2, the utterance CTPs (U) are generally more frequent than the directive verbs (D). This observation may be due to the fact these verbs are rather general in their semantics, especially when compared to other complement-taking predicates, and they can be used to introduce different types of speech acts (see e.g. Breindl, 1989, p. 205; Eisenberg, 2006; Pittner, 2013). An utterance verb like *sagen* 'say' for example may serve to introduce reported assertions (13a), reported commands (13b), reported expressives (13c) as well as reported declarations (13d):

(13) a. reported assertive
*Hans **sagte**, dass er nach Hause gehe.*
'Hans said that he was going home.'

b. reported directive
*Anna **sagte** Hans, dass er nach Hause gehen soll.*
'Anna told Hans that he should go home.'

c. reported expressive
*Hans **sagte** Anna, was für eine Idiotin sie sei.*
'Hans told Anna what an idiot she was.'

d. reported declaration
*Anna **sagte** Hans, er sei ab jetzt der Chef.*
'Anna told Hans he was the boss from now on.'

Irrespective of the semantic generality of utterance verbs, which may explain the observed differences in the overall frequency, the prototypical meaning of the utterance verbs selected for this study is associated with the expression of assertive speech acts.

From the overall number of tokens obtained by the lemma search, a sample of 27,000 observations evenly distributed over 6 periods of time, each 50 years long,

was created.[7] In doing so, 4,500 observations per period were retained to trace the original distribution of these verbs over the periods of time. After sampling, the observations were manually checked to discard false positive matches (these were mostly due to the inaccurate pos-tagging in the corpus, e.g. the noun *Gebot* 'command' was often falsely tagged as verb). After removing false hits, 24,446 observation remained.

All remaining matches were assigned to one of six 50-year time periods (1: 1600–1649, 2: 1650–1699, 3: 1700–1749, 4: 1750–1799, 5: 1800–1849, 6: 1850–1899). All tokens were coded for the complement type of the complement-taking verb. The label NS was assigned to non-sentential complements such as nouns, noun phrases, prepositional phrases, or pronouns, see e.g. (14).

(14) NS: Non-sentential complement
Er sah mir mehrmals betrübt und treuherzig ins Gesicht, aber er ***sagte*** *kein Wort*.
[Rosegger, Peter: Die Schriften des Waldschulmeisters. Pest, 1875]
'He looked me in the face several times, saddened and trusting, but he did not say a word.'

Of the 24,446 tokens remaining after the removal of false hits, 13,522 hits were assigned to the category NS and were then removed from the sample, as non-sentential complements are not in the focus of this study. The remaining 10,924 observations are combinations of complement-taking predicates with different types of sentential complements, and they provide the basis for the analysis.

Among sentential complements, several different types were distinguished, generally according to the description in Section 3. Non-finite complement clauses with the *zu*-infinitive were coded as zu_INF, see (15):

(15) zu_INF: Non-finite clause with *zu*-infinitive
Kurz darauf ***bat*** *ihn einer seiner Kollegen, ihm doch das erhaltene Präsent zu zeigen*. [Pückler-Muskau, Hermann von: Briefe eines Verstorbenen. Bd. 3. Stuttgart, 1831]
'Shortly afterwards, one of his colleagues asked him to show him the gift he had received.'

Complement clauses with the most common German subordinator *dass*[8] 'that' were generally coded as dass_, see e.g. (14).

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7. To do so, the *dplyr* R package was used (Wickham et al. 2018). Many thanks to Susanne Flach for pointing out this package to me and for providing the detailed and commented script.

8. There are two different spellings for this complementizer which do not correspond to any differences in meaning: the older one *daß* and the new one *dass*. In the analyzed corpus data, both spelling variants are present.

(16) dass_: Complement clause with *dass*
Der Monarch habe hierauf dem Herrn Bailli ***gesagt****, daß nicht die Minister ihn diesen bösen Rat gegeben hätten.*
[Staats- und Gelehrte Zeitung des Hamburgischen unpartheyischen Correspondenten. Nr. 119, Hamburg, 28. Juli 1789]
'The monarch said to Mr Bailli that it was not the ministers who gave him this bad advice.'

More fine-grained distinctions could in principle have been applied to this relatively abstract category dass_, but few of them turned out to be applicable and/or relevant for the present study. Firstly, the distinction between the indicative and the present subjunctive (= Konjunktiv I) forms in the complement clause, which has often been addressed in the literature (see e.g. Breindl, 1989; Smirnova, 2017; Fabricius-Hansen et al., 2018), was not used in the present study. From a practical point of view, this distinction cannot consistently be applied to all observation in the sample, as many present subjunctive forms are identical with the corresponding indicative forms. From a conceptual point of view, this distinction turns out not to be of primary interest for the present analysis. Recent research on indirect speech marking (cf. Fabricius-Hansen et al., 2018; Zifonun et al., 1997) has shown that the variation between the indicative and the present subjunctive, especially when encountered in complement clauses after CTPs of utterance, is not associated with a palpable difference in meaning.[9] Moreover, it has been pointed out (see e.g. Smirnova, 2017; Fabricius-Hansen et al., 2018; Demske, 2019) that the present subjunctive forms are ambiguous between the reportative and the volitive reading. That is to say, the same verbal form can be subject to different interpretations, and the disambiguation process is highly sensitive to the context. Most prominently, a particular interpretation depends on the CTPs in the matrix clause: reportative reading is associated with CTPs of saying, whereas volitive reading is linked to directive CTPs. Therefore, in the context of the present study, the mood distinction between the indicative and the present subjunctive could not be applied, as it represents a factor which may lead to circularity in argumentation, due to it being

9. „Die meisten echten Verba dicendi sind von Haus aus nicht faktiv […]: Der Autor beschreibt mit dem jeweiligen Prädikatsausdruck die Sprachhandlung, deren Inhalt im Komplementsatz wiedergegeben wird, lässt es aber offen, inwieweit er das Wiedergegebene für zutreffend oder nicht-zutreffend hält. Ob im abhängigen Satz der Indikativ oder der Konjunktiv verwendet wird, ändert in dieser Hinsicht nichts" (Fabricius-Hansen, 2018, p. 111). 'Most real verba dicendi are inherently non-factive […]: With the particular predicate, the author describes a speech action whose content is reported in the complement clause, but leaves open to what extent he considers the reported content to be apt or not. Whether the indicative or the subjunctive is used in the dependent clause is of no consequence in this respect.' [my translation; ES]

highly dependent on both the CTP type under investigation and the complement clause type with *dass* 'that'.

On the other hand, the distinction between full and modal verbs in the complement clause with *dass* (dass_V and dass_MV) is relevant for the present study, but only for the group of directive CTPs. This is mostly due to the following considerations: compared with CTPs of utterance (see above), directive verbs are more restrictive with respect to the speech acts they may introduce. Whereas the former may in principle report any kind of speech acts, the latter are restricted to reports of directive speech acts. This means that the variation of verb classes and verbal forms in the complement clauses of CTPs of utterance may be due to the original speech act and does not necessarily reflect preferences and diachronic changes in the complementation pattern itself. Furthermore, it has been pointed out (Petrova, 2008, Axel-Tober, 2013) that German complementation clauses of CTPs of utterance have not been subject to substantial changes since the earliest periods, especially as regards verbal classes and verbal forms. On the other hand, complementation patterns of reported directives have been subject to significant changes (see Section 5.2). Previous research has suggested that some modal verbs have developed towards analytic alternatives to the synthetic volitive subjunctive (Lühr, 1994, 1997; Petrova, 2013, Smirnova, 2017), and, as a consequence of this development, have progressively spread at the expense of the – often formally ambiguous – synthetic subjunctive forms. In sum, the difference between full and modal verbs in the complement clauses of directive CTPs constitutes a relevant distinction in the complementation pattern itself.

(17) dass_V: Complement clause with *dass* and a finite verb
*Er **bat** demnach demnach den Troll / <u>daß</u> er mit ihm <u>ging</u> / und zu Nacht bei ihm <u>speiste</u>* [Happel, Eberhard Werner: Der Academische Roman. Ulm, 1690]
'So he asked the troll that he went with him and dined with him by night.'

(18) dass_MV: Complement clause with *dass* and a modal verb
*Der König **befahl**, <u>daß</u> ihrer zwei ihn hinaus und zu Pferde bringen <u>sollten</u>.*
[Olearius, Adam: Offt begehrte Beschreibung Der Newen Orientalischen Rejse. Schleswig, 1647]
'The king ordered that two of them take should him out and on horseback.'

Another complement pattern of German that is relevant for this study is represented by the complement clause with the finite verb in the second position (V2). With respect to the annotation of this structure, a similar procedure has been applied: whereas verb-second complement clauses of CTPs of utterance have not been further specified with regard to the mood form or the class of the verb, the verb-second complement clauses of directive CTPs were differentiated with respect to these categories, see (19)–(21):

(19) V2: Verb-second complement clause, CTP of utterance
*Jda **sagte** mir ins Ohr, die Kranke hätte Clare eine Heilige genannt.*
[Rudolphi, Caroline Christiane Louise: Gemälde weiblicher Erziehung. Bd. 2. Heidelberg, 1807]
'Jda told me in my ear that the patient had called Clare a saint.'

(20) V2_V: Verb-second complement clause, directive CTP
*Daher **riete** ich einen solchen Menschen / er setzte lieber / bei ankommenden Donner-Wetter / sein Vertrauen auf Gott*
[Schmidt, Johann Georg: Die gestriegelte Rocken-Philosophia, oder auffrichtige Untersuchung derer von vielen super-klugen Weibern hochgehaltenen Aberglauben. Bd. 2. Chemnitz, 1705]
'Thus I would advise such a man / that he would rather / put his trust in God at the arrival of the thunder'

(21) V2_MV: Verb-second complement clause with a modal verb, directive CTP
*Von dem allen war ihr Herz ganz schwer, und sie **bat** das Tier, es sollte sie nur ein paar Tage wieder heim gehen lassen* [Grimm, Jacob; Grimm, Wilhelm: Kinder- und Haus-Märchen. Bd. 1. Berlin, 1812]
'Her heart was very heavy from all of that, and she asked the beast that he should let her go home only for a few days.'

Complement clauses with subordinators other than *dass,* such as *ob* 'if', *wie* 'how', *warum* 'why', etc. were put together into one category and assigned the label "w_". One potential problem of treating them on a par with the two other types discussed above, i.e. verb-second and verb-final complement clauses with *dass,* could be that they are non-prototypical expressions of reported speech acts. Often, they rather refer to the content of the reported speech act instead of reporting the speech act itself. In such cases, the complement clause cannot easily be transformed into the wording of the original speech act. On syntactic grounds, however, they represent typical dependent clauses, and for this reason they have been included into the annotation schema. As this type of complement clauses is only attested with CTPs of utterance and not with directive CTPs, it does not alter any results of the analysis concerning the complementation patterns of directive CTPs, which are focused on in this study.

(22) w_ : Complement clauses with subordinators other than *dass*
*Dieser **erzählte** / wie der König wohl zwanzig / teils Holländische / teils Englische Schiff um Ternate herum liegen hätte* [Gottfried, Johann Ludwig: Newe Welt Vnd Americanische Historien. Frankfurt (Main), 1631]
'He told / how the king had probably twenty / partly Dutch / partly English ships lying around Ternate'

Contexts of direct speech were treated as a separate category (=DS). Mostly, direct speech is marked in the corpus data by means of quotation signs or other

orthographical indices, see (23a); often, however, it appears orthographically unmarked, but is nevertheless recognizable, due, for example, to the non-shifted deictic reference, see e.g. (23b).

(23) a. DS: Direct speech complement (with orthographical marking)
*Ich **bitte** dich mit Tränen: Hilfe / daß ich mich bis ins Grab / Möge nach dir sehnen.* [Birken, Sigmund von: Heiliger Sonntags-Handel und Kirch-Wandel. Nürnberg, 1681]
'I beg you in tears: Help me / that I shall long for you into the grave'

b. DS: Direct speech complement (without orthographical marking)
*Aber ich **sagte** zu ihm, Du wußtest es ja, Allgütiger, daß ich beten würde.*
[Paul, Jean: Titan. Bd. 3. Berlin, 1802]
'But I said to him, you knew, good Lord, that I would pray.'

Table 3 summarizes the annotated data set with respect to individual CTPs and across six time periods. As can be seen, due to the exclusion of non-sentential complements, the original sample of 24,446 observations was reduced to 10,924 observations in the analyzed sample.

Table 3. Analyzed sample: CTPs with sentential complements, per period (D=directive, U=utterance)

PERIOD VERB	SEM	1 1600–1649	2 1650–1699	3 1700–1749	4 1750–1799	5 1800–1849	6 1850–1899	TOTAL PER VERB
sagen 'say'	U	791	793	578	620	595	606	3,983
bitten 'ask'	D	481	399	280	267	299	164	1,890
befehlen 'order'	D	323	296	144	118	83	79	1,043
erlauben 'allow'	D	56	105	183	239	128	114	825
antworten 'answer'	U	77	108	51	60	66	48	410
schreiben 'write'	U	73	101	81	48	46	47	396
verbieten 'forbid'	D	69	87	98	65	33	42	394
meinen 'mean'	U	53	66	77	38	73	72	379
raten 'advise'	D	34	82	77	75	57	22	347
gestatten 'permit'	D	33	32	32	27	52	103	279
gebieten 'demand'	D	53	54	30	21	27	36	221
erzählen 'tell'	U	32	29	38	37	39	43	218
behaupten 'claim'	U	2	12	19	56	63	59	211
erklären 'explain'	U	13	8	29	25	86	49	210
empfehlen 'recommend'	D	4	2	2	20	13	32	73
erwähnen 'mention'	U	1	4	4	6	9	21	45
TOTAL PER PERIOD		**2,077**	**2,178**	**1,723**	**1,722**	**1,669**	**1,537**	**10,924**

5. Diachronic changes in horizontal links

5.1 Within the network of reported directives: Strengthening of horizontal connections

In this section, the sentential types of complements of directive CTPs will be examined in more detail. On the basis of the corpus data from six time periods, I will attempt to show how horizontal connections of the 'allostruction' type emerge and get strengthen during the time.

Table 4 gives the absolute and relative frequencies of different complement types for eight directive CTPs under consideration distributed over six periods of time (non-sentential complements coded as NS were removed from the sample, see Section 4).[10] Figure 6 below visualizes the frequency numbers given in Table 4.

Table 4. Sentential complements of directive CTPs over time (aggregated)

COMPL	1 1600–1649	2 1650–1699	3 1700–1749	4 1750–1799	5 1800–1849	6 1850–1899
DS	54 (.05)	61 (.06)	33 (.04)	34 (.04)	45 (.07)	28 (.05)
dass_V	104 (.10)	98 (.09)	86 (.10)	61 (.07)	46 (.07)	47 (.08)
dass_MV	321 (.30)	254 (.24)	191 (.23)	113 (.14)	62 (.09)	31 (.05)
V2_V	4 (.003)	2 (.002)	1 (.001)	0 (0)	0 (0)	0 (0)
V2_MV	209 (.20)	187 (.18)	51 (.06)	27 (.03)	27 (.04)	11 (.02)
zu_INF	361 (.34)	455 (.43)	484 (.57)	597 (.72)	512 (.74)	475 (.80)
total	**1,053**	**1,057**	**846**	**832**	**692**	**592**

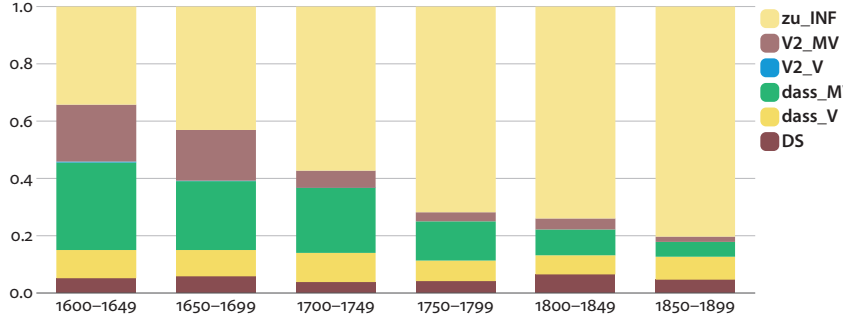

Figure 6. Diachronic shifts in complement types of directive CTPs

10. Chi-square test: $\chi 2 = 758.05$, $df = 25$, p-value < .0001, Cramér's V = .173.

Several observations are particularly relevant for the present context. Firstly, it can be seen that across the analyzed periods of time, the pattern with *zu*_INF is the most frequent complementation pattern. Less frequent, but still representative for the whole group of verbs, is the pattern with the finite complement clause with *dass* (dass_V & dass_MV), where the pattern with the modal verb is the preferred one. Other complementation patterns, including combinations with direct speech (DS), are distributed relatively sparsely over the data and make up less than one third of the overall corpus observations.

Secondly, looking at shifts in the relative distribution of the patterns over time, one general and pronounced tendency becomes evident. For the whole group of directive CTPs, there is a clear trend for the pattern with the *zu*-infinitive to become more frequent, whereas all other patterns are on the decline. The construction type with the non-finite complement clause *zu*_INF ends up as the dominant pattern of complementation at the end of the 19th century. The decline is most remarkable in the case of complement patterns with *dass*-clause and a modal verb (dass_MV): from 30% in the first period to 5% in the last period. The construction type with the dependent verb-second clause (V2_V) seems to have been only sporadically used from the beginning, disappearing completely during the 18th century (see above), whereas the verb-second construction type with modal verb survives, but shows clear evidence of decay.

What do these results tell us about the relations of construction types to each other in terms of the horizontal connections between them introduced in Section 3?

The different construction types introduced above share semantic properties, i.e. the expression of reported directives, and this shared semantics is generally guaranteed by their syntagmatic compatibility with directive CTPs. This syntagmatic compatibility with the same type of matrix CTP translates directly into the paradigmatic association between the complementation pattern themselves. These complementation patterns are connected to each other horizontally in terms of 'allostructions'; they represent paradigmatic *alternations*, which are semantically and functionally close to each other and can be considered synonyms.

With regard to the 'allostruction' horizontal links between constructions, it can be seen that the diachronic changes in frequency of different construction types follow a **uniform directionality** towards the dominant pattern with the *zu*-infinitive. This observation provides strong evidence for the existence and gradual strengthening of horizontal connections between the individual construction types, understood as 'allostructions'. The data presented above concerns eight different verbs with similar semantics and the diachronic shifts in complementation patterns of these CTPs reveal a strong relation between them: the CTPs behave similarly, especially with respect to the diachronic tendency.

However, as data of eight CTPs were aggregated, closer observation is required to see if the observed tendency and the uniformity holds if the histories of individual verbs are taken into account. Figure 7 shows the proportion of the most frequent complementation pattern [CTP_{dir} [*zu*_INF]] within the sentential complements across different verbs.

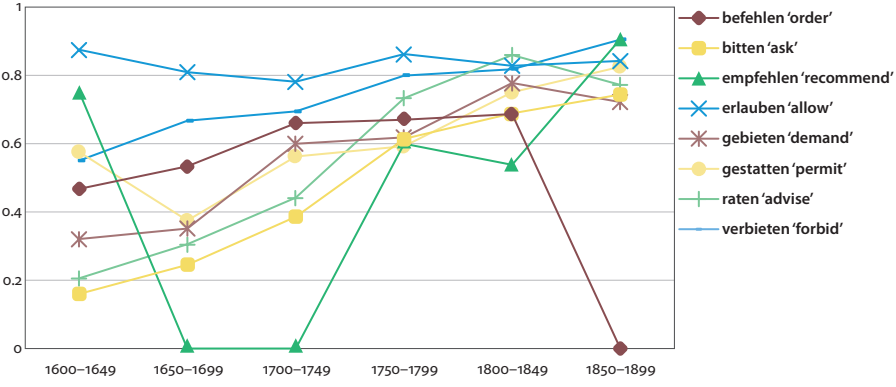

Figure 7. [CTP_{dir} [zu_INF]] with different CTP_{dir}: Relative frequency

As can be seen in Figure 7, the same diachronic tendency at the level of individual CTPs can be observed. Generally, the pattern with the *zu*-infinitive gains consistently in frequency and becomes the dominant complement variant for all verbs at the end the 19th century. However, there are also differences between the individual verbs, and these are mostly found in the earlier periods. In the first two periods (1600–1649 and 1650–1699), there is more variance with respect to the proportion of non-finite complements for each individual verb. In the first period, for example, *erlauben* 'allow', combines with the *zu*-infinitive in more than 80% of cases, whereas for *bitten* 'ask', the proportion of *zu*-infinitives is lower than 20%. As a consequence, *erlauben* 'allow' does not show any significant changes over time with respect to this complementation pattern, whereas *bitten* 'ask' does undergo significant changes.

What is particularly important with respect to the horizontal 'allostruction' links is that, over time, the CTPs become **more similar** to each other with respect to their complement patterns (exemplified in Figure 7 for the structure with the non-finite complement clause). At the beginning of the analyzed period, the CTPs combine with different types of complement clauses, but there is a lot of variation. At the end of the period, the CTPs combine with the same types of complement clauses, but there is much less variation with respect to their relative distribution. The horizontal connections between construction types – which, in addition,

potentially bear information about the relative distribution of alternating constructions – become thus even more pronounced over time.

The fact that horizontally related constructions become more tightly associated with each other and enter into the relation of alternation in the sense of 'allostructions' is also confirmed by the results of the correspondence analysis (Glynn 2014). Correspondence analysis is used as an explorative technique to identify patterns of association in the data. In our case, it maps different complementation patterns (e.g. dass_V, V2_V, zu_INF) and the CTPs at different periods of time (e.g. *bitten*_1 = *bitten* 'ask' in the first period of time). The results are presented in a two-dimensional plot. Figure 8 contrasts two plots, with the situation in the first period (1600–1649) on the left-hand side, and the last period (1850–1899) on the right-hand side of the diagram.

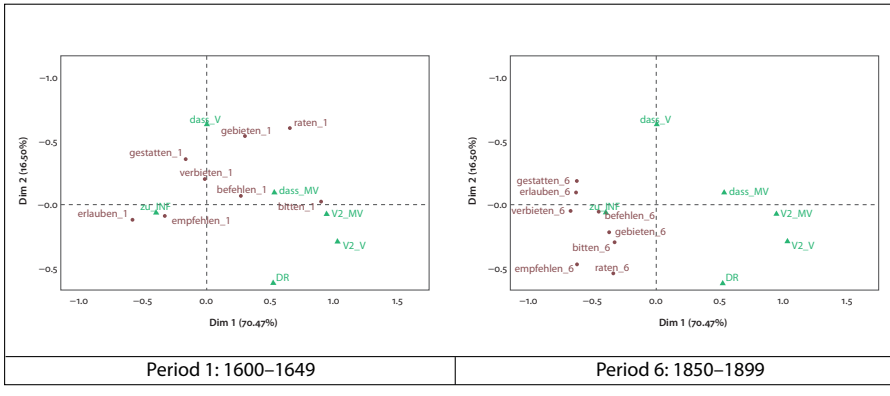

Figure 8. Directive CTPs in different construction types

Figure 8 shows that, in the first period, different verbs are more or less evenly distributed over the space structured by different complementation patterns. In the last period, however, the CTPs cluster more uniformly around the *zu*-infinitive, whereas the other patterns are located farther away. This picture confirms the observations made above on the basis of frequency data; here, further evidence comes from the observation of associations between the matrix verbs and their complementation strategies. More specifically, over time, individual verbs show less variation with respect to their complementation patterns, and they become more similar to each other as regards the (dis-)preferred combinations.

To conclude this section, I would like to present the "updated" versions of the constructional network of reported directives proposed in Section 3 above with added information about the relative distribution of the constructional patterns. As has been shown above, from the 19th century onwards, the constructional schema [CTP_{dir} [INF_{zu}]] is the most dominant and the most entrenched pattern within the

network of reported directives. To mark the dominant status of this construction type, the vertical connection to the higher-level schema [CTP$_{dir}$ [CC]] as well as the construction type itself are highlighted in bold (see Figure 9). Another piece of information that has been added to the original model is the somewhat peripheral status of the pattern [CTP$_{dir}$ [**V2**]], which disappears completely towards the end of the 19th century. For this reason, this construction type is marked as being only weakly vertically connected to the higher-level schema (indicated by the dashed line), and as only weakly entrenched (indicated in grey).

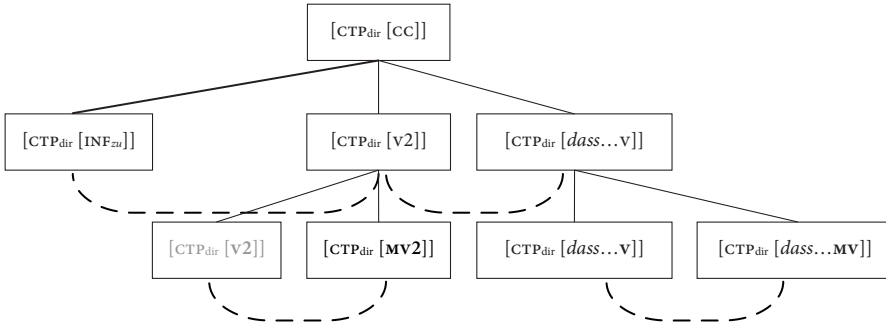

Figure 9. Constructional network of reported directives: Horizontal allostruction links (updated)

5.2 Paradigmatic opposition between reported statements and reported directives

In this section, I will deal with the second type of horizontal connections in the constructional network, i.e. the paradigmatic connections in terms of oppositions or 'paradigmatic choices'. To demonstrate how these connections may be observed in the data, I will use the constructional family of reported statements as a contrasting case to the family of reported directives described above. Table 5 gives the absolute and relative frequencies of different complement types for the eight CTPs of utterance under consideration distributed over six periods of time (non-sentential complements coded as NS were removed from the sample, a similar step was carried out for the group of directive CTPs in Section 5.1).[11] Figure 10 below visualizes the frequency numbers given in Table 5.

11. Chi-square test: $\chi 2 = 167.45$, $df = 20$, p-value < 2.2e-16, Cramér's V = .085. Note that the effect size in smaller here, compared to the results of chi-square test performed on the data of reported directives.

Table 5. Utterance CTPs and their sentential complements, over time (aggregated)

COMPL	1 1600–1649	2 1650–1699	3 1700–1749	4 1750–1799	5 1800–1849	6 1850–1899
direct speech	709 (.68)	765 (.68)	451 (.52)	488 (.55)	548 (.56)	543 (.57)
dass_	160 (.15)	197 (.18)	251 (.29)	226 (.25)	206 (.21)	242 (.26)
V2	119 (.11)	125 (.11)	108 (.12)	116 (.13)	173 (.18)	115 (.12)
w_	47 (.05)	29 (.03)	55 (.06)	60 (.07)	37 (.04)	37 (.04)
zu_INF	7 (.007)	5 (.004)	12 (.01)	0 (0)	13 (.01)	8 (.008)
total	**1,042**	**1,121**	**877**	**890**	**977**	**945**

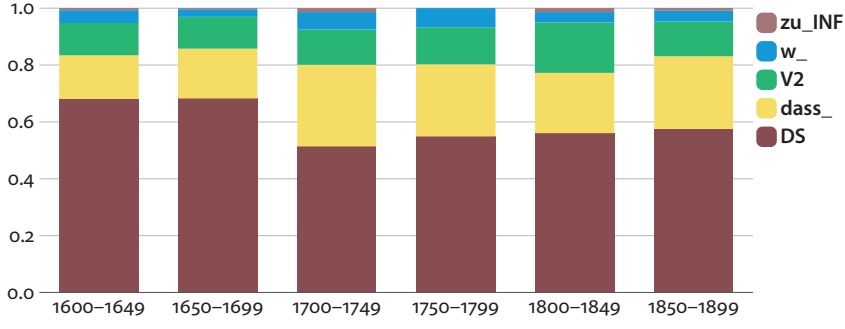

Figure 10. Diachronic shifts in complement types of CTPs of utterance

Several observations are relevant for the comparison with the reported directives discussed in the previous section. Firstly, it can be seen that the inventory of complementation patterns is different: this is partly due to the annotation schema described in Section 4 above, but also to the different complementation patterns found in the data, such as dependent clauses introduced by *wh*-words, which are completely absent from the inventory of reported directives. Importantly, the pattern with the non-finite complement clause zu_INF is extremely rare.[12] A closer look into the data reveals that the *zu*-infinitive complement clause is attested only with two CTPs, namely *meinen* 'mean' and *behaupten* 'claim'. In combination with the latter, see e.g. (24), the form exclusively used is the perfect infinitive form, hence it

12. This observation is consistent with the general diachronic development of the *zu*-infinitive in German towards a sentential complement with basically purposive and goal-oriented semantics (see Smirnova, 2016 and the references therein).

radically differs from the non-finite complements of the directive CTPs, which are exclusively present infinitives. *Meinen* 'mean', on the other hand, seems to change its utterance meaning and become a non-factive mental verb of thinking, the complement clause referring to the impression, and not to report someone's statement, see (25). These formal and semantic details preclude any direct comparison with the group of directive CTPs, so that the *zu*-infinitives of CTPs of *meinen* 'mean' and *behaupten* 'claim' can be completely disregarded in the following.

(24) *Sie **behauptete**, keine Anzeige gelesen zu haben.*
[Gutzkow, Karl: Die neuen Serapionsbrüder. Bd. 2. Breslau, 1877]
'She claimed not to have read the announcement.'

(25) *Wenn man nicht hinter sich schaut, **meint** man gerade wie ein Vogel mitten über dem Meere zu schweben.* [Brehm, Alfred Edmund: Illustrirtes Thierleben. Bd. 5. Hildburghausen, 1869]
'If you don't look behind you, you think you are floating like a bird over the sea.'

Secondly, it can be seen that across the periods of time analyzed in this study, the distribution of different patterns is not subject to any significant changes. The most frequent pattern is represented by the direct speech complements DS. Other construction types available are those with *dass*-clauses and dependent verb-second clauses; but they do not seem to change considerably over time. A closer look at the individual CTPs of utterance in combination with the *dass*-clause (see Figure 11) and their changes over time confirms that no uniform diachronic tendency can be detected at the level of individual combinations either (especially when compared with changes represented in Figure 8 above).

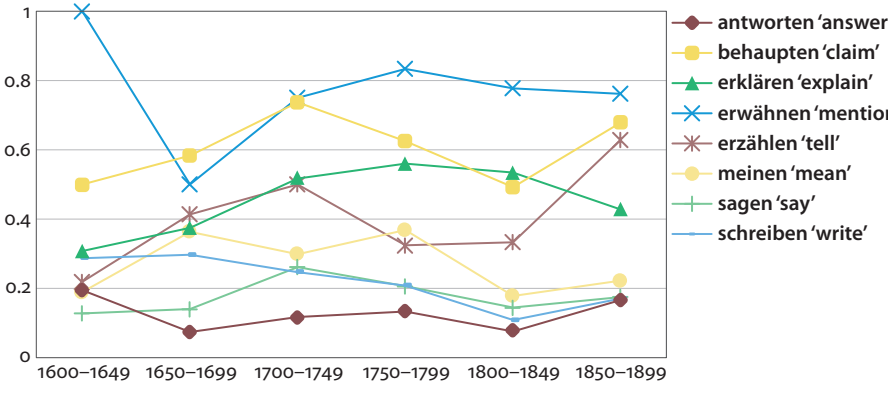

Figure 11. [CTP_{utt} [dass…V]] with different CTP_{utt}: Relative frequency

If we compare these results with the observations presented in the previous section, we may safely conclude that reported directives on the one hand and reported statements on the other constitute two different constructional families and two different constructional paradigms. Within each family of constructions, there are semantic and formal properties which are shared among the members of the family, and these collective properties are decisive for their differentiation.

As introduced in Section 3, the so-called 'paradigmatic choice' view on the horizontal connections between constructions is generally based on correspondences between pairs of constructions, understood in terms of paradigmatic choices, which are in semantic opposition to each other and – ideally – constitute minimal pairs. At this point, I would like to deal with some more qualitative aspects of this study and discuss two contrasting cases which provide a clear illustration of the phenomenon of paradigmatic choice. The following discussion will further elaborate on the distinct properties of constructions from two different paradigms.

As has been mentioned above, dependent verb-second clauses of the general form [CTP [V2]] may be found in both constructional paradigms and are used to express reported directives and reported statements. However, as observed in Section 5.1, verb-second clauses with finite full verbs are at most very marginal – if not completely absent – as an option for expressing a reported directive. Instead, modal verbs are predominantly used in the dependent verb-second complement clauses, see (26a). For the reported statement, on the other hand, verb-second clauses with main verbs constitute a common and conventionalized construction type, see (26b). Importantly, if a modal verb such as *sollen* 'should', *mögen* 'may' or *wollen* 'want' is used in the verb-second complement clause after a CTP of utterance, the whole sentence will very likely be interpreted as a reported directive, and not as a reported statement (see the discussion of the examples in (13) above).

(26) a. reported directive
Er hatte ***gebeten****, Jean Paul* *möge* *ihm bei künftigen Aufenthalten in Bayreuth täglich schreiben.* [Jean Paul: Dritte Abteilung Briefe. 1796]
'He had asked (that) Jean Paul would write him daily during future stays in Bayreuth.'

b. reported statement
Wie sehr mußte man erstaunen, als der ehrsame Bürger ***erklärte****, er* *kenne* *Doktor Pack so gut wie gar nicht.* [Ranke, Leopold von: Deutsche Geschichte im Zeitalter der Reformation. Bd. 3. Berlin, 1840.]
'How astonished one had to be when the honorable citizen declared that he barely knew Doctor Pack.'

In this sense, we can speak of a minimal pair relation which motivates a horizontal link of paradigmatic opposition between constructions at the same level of the

constructional hierarchy. The distinct structural feature in this minimal pair is specified as the type of finite verb used in the complement clause; this structural distinction is associated with a clear semantic contrast, i.e. reported directive vs reported statement. It is for this reason that the construction types [CTP$_{dir}$ [**MV2**]] and [CTP$_{utt}$ [**V2**]] are linked to each other horizontally in Figure 12, and the verb types MV and V are highlighted in bold (see Figure 12).

The second type of minimal pair has already been briefly mentioned in Section 3 above and concerns the opposition between the complementation patterns with *dass*-clause. Complement clauses with *dass*, which represent the most prototypical German complement clause, may be found in both constructional families and are commonly used to report statements as well as directives, see (27a–b) with the same finite verb *machen* 'do, make' in the complement clause.

(27) a. reported directive
*hat er Gott **gebeten** / daß Er ihn lebendig machte*.
[Olearius, Adam: Offt begehrte Beschreibung Der Newen Orientalischen Rejse. Schleswig, 1647]
'he has asked God that He may bring him to life'

b. reported statement
*Man muss ihm **sagen**, daß er sich dadurch für die Fortpflanzung des Geschlechtes unnütz mache*.
[Kant, Immanuel: Über Pädagogik. Königsberg, 1803]
'One must tell him that he thereby makes himself useless for the reproduction.'

These two construction types are in opposition to each other with respect to the type of speech act they report: whereas (27a) reports a directive speech act, in this specific case a plea, (27b) reports a statement, an assertion. The distinct structural feature that serves to differentiate between these syntactic structures is the complement-taking verb itself, that is, a verb of request in (27a) and a communication verb in (27b). The paradigmatic opposition is thus constituted by the use of a particular CTP in the matrix clause, which crucially influences the interpretation of the complement clause as a reported directive or as a reported statement. Contrary to the case just described, it is not an element of the complement clause, but an element of the matrix clause which motivates the paradigmatic choice and the semantics of the whole structure. The semantic contrast remains however the same, i.e. the opposition between a reported directive and a reported statement. This is why the construction types [**CTP$_{dir}$** [*dass*…V]] and [**CTP$_{utt}$** [*dass*…**V**]] are linked to each other in Figure 12, and the complement taking verbs **CTP$_{dir}$** and **CTP$_{utt}$** are highlighted in bold (see Figure 12).

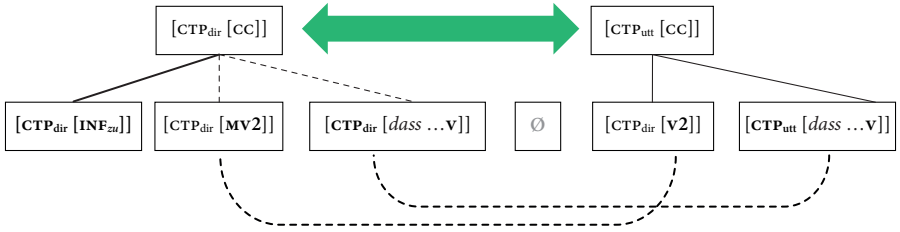

Figure 12. Reported directives contrasted with reported statements: Horizontal links (updated)

At this point, I would like to emphasize again that the relation of paradigmatic opposition on the highest level of abstraction in Figure 12, i.e. the horizontal link between the most schematic patterns [CTP$_{dir}$ [CC]] with a directive complement-taking verb and [CTP$_{utt}$ [CC]] with a complement-taking verb of utterance is of a different conceptual nature (and receives a different marking in Figure 12). Namely, this contrast cannot be postulated via a direct contrast of these two constructional schemas with each other. Instead, the contrast on this high level of abstraction, i.e. the contrast between the paradigms or families of constructions tied together by horizonal allostruction links, is **indirectly motivated** by the lower levels of the constructional hierarchy, namely by pairwise contrasts between constructions on lower levels of abstractions in the sense described in this section.

6. Conclusions

With respect to different construction types of reported directives and their distribution in the corpus data, the present study has demonstrated that they are not evenly distributed. The construction type with the non-finite complement clause [CTP$_{dir}$ [INF$_{zu}$]] is the most frequent one and constitutes the most prototypical means of expression for reported directives. At the end of the analyzed period, i.e. at the end of the 19th century, instantiations of this construction type make up for ca. 80% of all observations. Other construction types are on the decline, most likely due to the spread of the dominant *zu*-infinitive construction.

With respect to more specific internal properties of different construction types, it has been shown that the distinction between full verbs and modal verbs constitutes a relevant structural parameter. Modal verbs, most frequently *sollen* 'shall' and *mögen* 'may', are strongly associated with the reported directives, and in some cases even represent distinctive features of the respective construction types. The contrasting observation of the syntactic patterns of reported directives with those of reported statements has shown that these two groups of constructions

constitute two distinct paradigms or constructional sub-families with their own vertical and horizontal connections within and between them.

From the theoretical perspective, this paper was concerned with the issue of paradigmatic organization of constructions in the network. It has argued for the maintenance of the conceptual distinction between two types of horizontal connections between constructions, i.e. the 'allostruction' type and the 'paradigmatic choice' type of horizontal links. Using the example of reported directives and reports statements in German, it has been demonstrated that these two types of links are essential for building a network model of constructional families. Regarding the constructional family of reported directives, the vertical and two types of horizontal links have been modeled in more detail. Moreover, it has been shown how these types of horizontal links manifest themselves in the corpus data.

To conclude, I would like to mention a potential limitation to the approach advocated here which opens up new avenues for further research. It might be the case that the two approaches to horizontal links adopted in this study, i.e. the so-called 'allostruction' and the 'paradigmatic choice' views, have more in common than might appear at first glance, and that essentially, differences in conceptualization are dependent on the perspective taken by a particular study or a researcher. In both accounts, the existence of a more schematic, i.e. vertically superordinate, higher-level schema, is taken as pivotal for the postulation of horizontal links; or, to put it differently, the detected horizontal links motivate the postulation of the higher-order schemas. In the 'allostruction' view, the higher-order schema is motivated by the syntagmatic distributional properties: if an element may combine with two other different elements without great difference in meaning, these latter elements are taken to be alternatives of each other, or 'allostructions'. In the 'paradigmatic choice' view, the abstraction of a superordinate higher-level schema is less dependent on shared semantics, and may sometimes be made on fully general grounds (cf. esp. Booji's (2016) "second-order schema" and Diewald's (2020) "hyperconstruction").

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Constructionalization of Japanese *koto* imperatives

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This paper examines *koto* imperatives (e.g., *tōku-o mite unten-suru koto!* 'drive looking far ahead!') in Japanese. With internal reconstruction, it is shown that *koto* imperatives not only underwent a process of pragmatic strengthening resulting in a new sense of modality, but also inherited the syntactic schema of the prototypical modal (raising-to-subject) construction. Given this new meaning associated with new syntax, it is proposed that *koto* imperatives are an instance of constructionalization. Given the similarities between *koto* imperatives and suspended clauses (Ohori, 1995), the current analysis also raises the possibility that constructionalization may take place or may be taking place with other emerging modality expressions in Japanese.

Keywords: constructionalization, imperative, Japanese, suspended clause

1. Introduction

Constructionalization is "the creation of a $form_{new}$-$meaning_{new}$ pair" (Traugott & Trousdale, 2013, p. 1). It is distinguished from constructional changes, which involve changes in form or meaning, but not both. Traugott and Trousdale explain that constructionalization is a process in which speakers apply a new analysis ("neoanalysis") to a construction in a network of constructions to create a new form-meaning pair. For example, they report that in the 18th century, speakers began associating *a lot of*, which originated in a structure involving a noun *hlot* 'an object by which individuals were selected' (OE), with the meaning of quantity by pragmatic implicature. By the beginning of the 19th century, we start seeing cases where only the quantifier reading is allowed. What makes *a lot of* a clear instance of constructionalization is that once the quantifier meaning was conventionalized, the meaning shift affected its syntactic structure and triggered the emergence of a newly conventionalized sign: While N in *a lot of N* used to be a modifier, the assignment

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of the quantifier reading to *a lot of* made the N the head of the structure. According to Traugott and Trousdale, this happened because speakers applied the existing schema of quantifiers to *a lot of* with the quantifier meaning in a construction network (pp. 23–26). In this paper, I will show that Japanese *koto* imperatives, as in (1), are another instance of constructionalization.[1]

(1) *Tōku-o mite unten-suru* ***koto****!*[2]
far-ACC look driving-do KOTO
'Drive looking far ahead!'
(The Balanced Corpus of Contemporary Written Japanese, 2005)

Koto imperatives are said to have developed from imperatives with explicit verbs of command (Okamoto, 1995; Uchibori, 2007). However, I will show that *koto* imperatives have unique semantic and syntactic properties that are different from those of the source construction, and that the notion of constructionalization helps us understand why *koto* imperatives behave as they do and how they came into existence. I will also discuss how the current constructional analysis of *koto* imperatives brings new insights into other emerging modality structures (Ohori, 1995).

The organization of this paper is as follows: In Section 2, I will examine the semantic and syntactic properties of *koto* imperatives. In particular, I will show that in terms of semantics *koto* imperatives exhibit well-known characteristics of imperatives (Nitta, 1991). I will also illustrate how the use of *koto* imperatives differs from that of imperatives with explicit verbs of command. I will demonstrate that

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1. There are different approaches for categorizing imperatives. For example, pointing out that other modal sentences can be true or false but imperatives cannot, Portner (2007) excludes imperatives from modal sentences. On the other hand, by showing that imperatives are part of larger inflectional or suffix systems that include the Permissive or the Commissive in languages such as Ngiyambaa and Native American Indian Languages, Palmer (2001, pp. 80–82) suggests that imperatives may be part of a modal system. Bybee and Fleischman (1995, p. 6) include imperatives as part of speaker-oriented modality with which the speaker attempts to influence hearer's actions. Bybee and Fleischman define modality as follows:

> Modality, on the other hand, is the semantic domain pertaining to elements of meaning that languages express. It covers a broad range of semantic nuances – jussive, desiderative, intuitive, hypothetical, potential, obligative, dubitative, hortatory, exclamative, etc. – whose common denominator is the addition of a supplement or overlay meaning to the most neutral semantic value of the proposition of an utterance, namely factual and declarative. (p. 2)

Nitta (1991) also categorizes Japanese imperatives as part of modality using a similar classification. I will follow Bybee and Fleischman (1995) and Nitta (1991) and assume that *koto* imperatives are part of modality in this paper.

2. I will discuss the meaning and function of *koto* in Section 2.

koto imperatives are similar to prototypical modal (raising-to-subject) sentences with respect to syntax.

In Section 3, I will provide a constructional analysis and a possible explanation for the properties of *koto* imperatives discussed in Section 2. I will claim that *koto* imperatives not only went through the process of pragmatic strengthening to gain a new sense of command, but were also *sanctioned* (Langacker, 1987; Traugott & Trousdale, 2013) by the schema of the prototypical modal (raising-to-subject) construction and inherited its syntactic structure. I will thus propose that *koto* imperatives are an instance of constructionalization in which the (new) meaning of the imperative is associated with a (new) syntactic structure corresponding to a modal construction.

Finally, in Section 4, I will show that the transformation of the complementizer *koto* into a modality marker is not an isolated phenomenon. The Japanese culture, which favors indirect communication, motivates the speaker to leave things unsaid and encourages the hearer to infer the meaning of the unsaid. This culturally motivated practice of omission and inference has prompted the development of many other structures similar to *koto* imperatives. I will explore the possibility that the emergence of *koto* imperatives is part of commonly observed changes in Japanese.

2. Japanese *koto* imperatives

In Japanese, as in many other languages, one way to express an order is to use verbs of command, such as *meizuru* and *mōshitsukeru*, performatively. An example is given in (2).

(2) [[*Heisei 15-nen 7-gatsu 29-nichi-madeni tōshoku-ate hōkoku-suru*]
Heisei 15-year July 29th-by us-to reporting-do
koto]-*o* *meizuru.*
COMP-ACC order
'(We) order to report to us by July 29, 2003.' (BCCWJ, 2004)

In (2), the verb takes a sentential complement headed by the complementizer *koto*, which is followed by the accusative marker *o*. What is interesting is that it is possible to have a sense of command with the complement clause alone:

(3) *Heisei 15-nen 7-gatsu 29-nichi-madeni tōshoku-ate hōkoku-suru* ***koto***.
Heisei 15-year July 29th-by us-to reporting-do KOTO
'Report to us by July 29, 2003.'[3,4]

In (3), the clause headed by *koto* appears without the accusative marker *o* or the verb of command, yet it still expresses a sense of command.[5]

Okamoto (1995) claims that (3) is not an elided version of (2), because (2) is much more authoritative and has a stronger sense of command than (3) (p. 235). Given these differences, Okamoto claims that the sense of command in (3) does not come from an elided verb. She proposes that through the process of pragmatic strengthening (Traugott, 1988; Traugott, 1989), *koto* has become a sentence-final particle and has started expressing a sense of command by itself. Pragmatic strengthening is a process in which the involvement of the speaker makes the expression more informative and expressive (Traugott, 1988, p. 411). Okamoto (1995, p. 243) asserts that the pragmatic meaning of the elided version of (2) is conventionalized and that (3) departs from the original source of (2) via the association

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3. The example in (3) was constructed by the author based on (2). Unless otherwise indicated, all examples without a source in this paper are constructed by the author.

4. A reviewer raised the possibility that this sentence could be classified as involving an agent-oriented modality. On agent-oriented and speaker-oriented deontic modalities, Bybee and Fleischman (1995) point out the following difference:

> …the distinction between agented-oriented and speaker-oriented modalities cross-cuts the traditional category of deontic modality. Agent-oriented modals include deontic statements (statements that describe obligations and permissions), while speaker-oriented modals include speech-act types such as imperatives that impose conditions on obligations. (p. 6)

Koto imperatives are speaker-oriented because they assert an obligation brought out by the speaker. This contrasts with a statement with a deontic modality expression (*a*)*nakerebanaranai* 'must,' as shown in (i). In (i), the obligation to report by July 29, 2003, does not have to come from the speaker. Therefore, (i) may be uttered by someone who describes by when one needs to report, even if he does not have the authority to order others to report. On the other hand, if (3) is uttered by someone who does not have the authority to order others to report by July 29, 2003, it will be infelicitous. (See Section 2.1 below for the semantics of *koto* imperatives.)

(i) *Heisei 15-nen 7-gatsu 29-nichi-madeni hōkoku-shi nakerebanaranai.*
Heisei 15-year July 29th-by reporting-do must
'(It) must be reported by July 29, 2003.'

Therefore, in this paper, *koto* imperatives are categorized as a type of speaker-oriented modality (which Nitta (1991) calls utterance-oriented modality) rather than agent-oriented modality.

5. For a good general discussion of universality and variations in imperatives, see König and Siemund (2007).

of the imperative with *koto* and the elevation of the (original) complement clause to a main clause.

I will start this section where Okamoto's (1995) analysis leaves off. Following Okamoto, I assume that while *koto* imperatives developed from imperatives with explicit verbs of command, they are now different. However, beyond the fact that the senses of (2) and (3) are different, we still do not have a full understanding of *koto* imperatives. Thus, this section will examine the semantic and syntactic properties of *koto* imperatives in detail.

2.1 Semantic properties of *koto* imperatives

Nitta (1991) categorizes imperatives as utterance-oriented modalities and claims that prototypical imperatives, as in (4), have the characteristics shown in (5). For example, the prototypical imperative in (4), *tottoto kaere* 'go home at once!,' is uttered by someone who is in a position to order the hearer to go home (5a); the speaker expects the hearer to go home (5b); the hearer's going home is desirable for the speaker (5c); there is someone who is ordered to go home (5d); if the hearer chooses, it is possible for the hearer to go home (5e); and the hearer's going home has not happened yet (5f).

(4) *Tottoto kaere.*
at.once go.home
'Go home at once!' (BCCWJ, 2005)

(5) Semantic characteristics of imperatives (Nitta, 1991)
   a. The speaker is in the position to give an order.
   b. The speaker expects the hearer to do something.
   c. The action that the speaker expects the hearer to do is convenient, desirable, or favorable for the speaker.
   d. There is a recipient of the order.
   e. If the hearer chooses, the hearer can realize and accomplish the order with will.
   f. What is ordered has not happened yet.

Koto imperatives also exhibit these characteristics of imperatives. In (3) (repeated here as (6)), the speaker is in a position to order the hearer(s) to report by July 29, 2003; the speaker expects someone to report; reporting is desirable for the speaker; there are people who are ordered to report; if the recipient of the order so chooses, it is possible for him to report; and finally, the recipient of the order has not reported yet.

(6) *Heisei 15-nen 7-gatsu 29-nichi-madeni tōshoku-ate hōkoku-suru* ***koto****.*
Heisei 15-year July 29th-by us-to reporting-do KOTO
'Report to us by July 29, 2003.'

Thus, it is safe to conclude that *koto* imperatives are a type of imperative, and therefore belong to utterance-oriented modalities.[6]

Although *koto* imperatives are a type of imperative, utterance-oriented modality, as Okamoto (1995) points out, their meaning is different from that of the imperatives with explicit verbs of command from which *koto* imperatives are considered to have developed. In fact, this difference in meaning affects where *koto* imperatives and imperatives with explicit verbs of command may be used. For example, imperatives with explicit verbs of command are often found in court decisions, but not in other contexts.[7,8] On the other hand, *koto* imperatives are found

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6. There is another structure similar to *koto* imperatives, as shown in (i). This structure occurs with *koto da*.

(i) *Nemureru uchini nemutte oku koto da.*
can.sleep while sleep place KOTO is
'Sleep while you can.' (BCCWJ, 1989)

Although the sentences with *koto da* look similar to *koto* imperatives, Miyazaki et al. (2002, p. 58) point out that they are different from *koto* imperatives: *Koto* imperatives express an order from someone in an authoritative position, but *koto da* has the nuance of advice in which the speaker tells the hearer what to do so that the hearer may avoid undesirable situation. Furthermore, *koto da* does not necessarily satisfy the characteristics of imperatives in (5). For example, *koto da* may be desirable to the hearer, but it does not have to be desirable to the speaker. Thus, while they look similar, I assume that *koto* imperatives and *koto da* are different.

7. Ramson (1988) reports that the Korean complementizer *kEs* means 'thing' and is used as the imperative modality marker in government documents. For the comparative analysis of Japanese *no* and Korean *kEs*, see Horie (2011).

8. A reviewer pointed out that the difference between imperatives with explicit verbs of command and *koto* imperatives can be explained in terms of Rhodenburg's (1996, p. 173) 'complexity principle':

(i) Complexity principle:
In the case of more or less explicit grammatical options the more explicit one(s) will tend to be favored in cognitively more complex environments.

Through the investigation of a variety of constructions, such as discontinuous constructions and the contrast between finite and non-finite clauses in English, Rhodenburg claims that the principle captures the tendency for an explicit syntactic option to be more formal than its less explicit alternative. Japanese imperatives with verbs of command are more explicit and formal than *koto* imperatives. Thus, it appears that the complexity principle also explains the difference in the context of use between these structures.

in rules and regulations.[9] An actual example of a *koto* imperative which was found in the Model Rules of Employment developed by the Ministry of Health, Labour and Welfare, is shown in (7):

(7) *Furikae-wa zenjitsu-madeni tsūchi-suru* ***koto***.
switch-TOP day.before-by notice-do KOTO
'Provide employees with a minimum one-day advance notice of the switch.'
(Ministry of Health, Labour and Welfare, 2020)

However, the document consistently avoids explicit verbs of command. If a verb of command *meijiru* is added to (7), as shown in (8), it will sound unnecessarily commanding and become inappropriate.

(8) #[[*Furikae-wa zenjitsu-madeni tsūchi-suru*] *koto*]-*o* *meijiru.*
COMP-ACC order
'(The company/we) order you to provide employees with a minimum one-day advance notice of the switch.'

By avoiding a verb of command in (7), the company tries to seem less authoritative. On the other hand, Endicott (2016, p. 1) states that "Lawmakers characteristically use language to make law, and law must provide for the authoritative resolution of disputes over the effects of that use of language." It can thus be said that employing verbs of command in court decisions is an attempt to maintain an authoritative tone. In sum, this difference in intentions between these genres appears to dictate where imperatives with explicit verbs of order and *koto* imperatives are used.

Furthermore, if you look at *koto* imperatives closely, they show some idiosyncrasies that separate them from regular imperatives. When regular imperatives violate the conditions of imperatives mentioned in (5), they are sometimes associated with non-imperative meanings (Nitta, 1991, pp. 247–250). For example, in (9), the action is non-controllable (violation of (5e)) and the sentence expresses a wish rather than an order. In (10), the speaker neither expects the hearer to tell a lie (violation of (5b)) nor thinks that telling a lie is desirable (violation of (5c)). With these violations, the example in (10) is not interpreted as a command but as a condemnation.

9. According to Searle (1969), there are two types of rules: regulative rules, such as the rules of etiquette, which concern actions that can be performed independently of the rules; and constitutive rules, such as the rules of chess, which define possible actions. *Koto* imperatives express regulative rules. I thank the reviewer for directing my attention to this distinction.

(9) *Shindeshimae.*
die (imperative form)
'I wish you were dead.' (Nitta, 1991, p. 248)

(10) *Uso-o tsuke.*
lie-ACC tell (imperative form)
'Liar!' (Nitta, 1991, p. 250)

However, if *koto* imperatives are used in (9) and (10), they must still be understood as imperatives.

(11) *Shindeshimau* ***koto****.*
die KOTO
'Die!'

(12) *Uso-o tsuku* ***koto****.*
lie-ACC tell KOTO
'Tell a lie!'

In addition, while regular imperatives can be used to give permission (Nitta, 1991, p. 250), as in (13), *koto* imperatives express only a command and not permission, as shown in (14).

(13) *Tabe-tai-dake otabenasai.*
eat-want-only eat (imperative form)
'Please eat as much as you want.' (Nitta, 1991, p. 251)

(14) *Tabe-tai-dake taberu* ***koto****.*
eat-want-only eat KOTO
'Eat only the amount that you want to eat!'
'*Please eat as much as you want.'

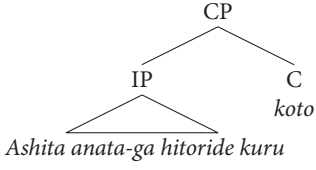
Thus, the use of *koto* imperatives is much narrower than that of other, regular imperatives.

To summarize, *koto* imperatives have the semantic properties of imperatives, but they differ from imperatives with explicit verbs of command in that they are less formal. In comparison to regular imperatives, *koto* imperatives do not follow all the same patterns. Following Okamoto (1995), I assume that the imperative meaning of *koto* imperatives is not encoded in an elided verb of command. Rather, the meaning comes from the construction of *koto* imperatives.

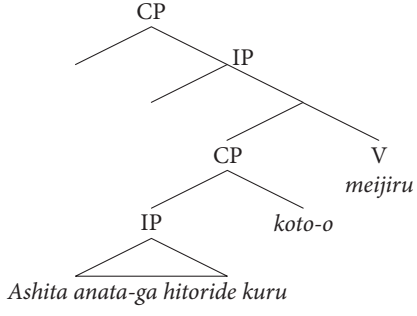
2.2 Syntactic properties

While the meaning of *koto* imperatives has been discussed by some linguists (Okamoto, 1995; Noda, 1995; Miyazaki et al., 2002), the syntactic structure of *koto* imperatives has not been fully explored. The only exception is Uchibori (2007). Uchibori's claim is that *koto* imperatives are similar to imperatives with explicit verbs of command, as shown in (15) and (16). In both (15) and (16), the entire clause, *ashita anata-ga hitoride kuru* 'you come alone tomorrow,' is the complement of the complementizer *koto*.

(15) Syntactic structure of *koto* imperatives in Uchibori (2007)
[*Ashita anata-ga hitoride kuru*] ***koto***.
tomorrow you-NOM alone come KOTO
'You come alone tomorrow!' (Uchibori, 2007, p. 295)



(16) [[*Ashita anata-ga hitoride kuru*] *koto*]-*o* *meijiru*.
tomorrow you-NOM alone come COMP-ACC order
'(I) order that you come alone tomorrow.'



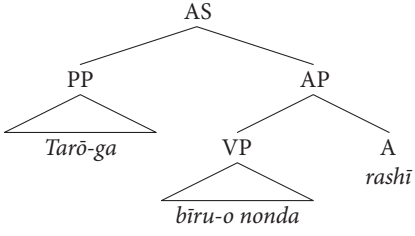
However, I will claim that the structure of *koto* imperatives is more similar to that of other modal sentences as Ueno (2017) proposes, as shown in (17).[10] In (17),

10. Ueno claims that the epistemic construction in (17) is justified by the fact that the adverb *dōyara* 'somehow, evidently,' which modifies *rashī* 'seem' and has to be in the same clause with *rashī,* can appear between *Tarō-ga* and *bīru-o nonda*, as shown in (i).

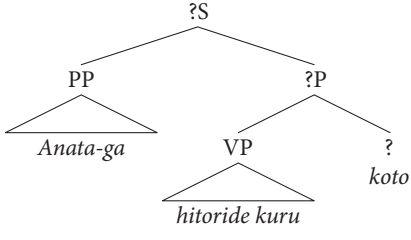
(i) *Tarō-ga* [*dōyara bīru-o nonda rashī*]. (Ueno, 2017, p. 106)
Taro-NOM somehow beer-ACC drank seem
'Taro seems to have drunk beer.'

the subject *Tarō-ga* of the predicate *nonda* 'drank' is outside the constituent consisting of *bīru-o nonda* 'drank beer' and *rashī* 'seem,' reminiscent of the so-called raising-to-subject structure. The tree in (18) is the proposed syntactic structure of *koto* imperatives that I will discuss in detail below. The crucial point is that just like (17), the subject *anata-ga* of the *koto* imperative in (18) is outside the constituent that comprises *hitoride kuru* 'come alone' and *koto*.

(17) Sentence with *rashī* 'seem'[11]
Tarō-ga [*bīru-o nonda rashī*]. (Ueno, 2017, p. 105)
Taro-NOM beer-ACC drank seem
'Taro seems to have drunk beer.'



(18) Proposed structure of *koto* imperatives[12]
(*Ashita*) *anata-ga* [*hitoride kuru koto*].
tomorrow you-NOM alone come KOTO
'You come alone tomorrow!'



11. I adopt the node labels used by Ueno (2017). First, AS refers to an adjectival sentence with *rashī* 'seem' as its head. Because *rashī* follows the adjectival inflection pattern (e.g., *rashī* 'seem' and *rashikatta* 'seemed,' just like *warui* 'is bad' and *warukatta* 'was bad'), it is categorized as an adjective. Second, the subject *Tarō-ga,* which consists of a proper noun and a nominative-marking postposition, is labeled as PP. In Japanese syntax, depending on what one assumes as its head, a nominal argument is labeled as a PP, NP, or DP. Ueno's convention (2017), which I assume in this paper, adopts PP.

12. I will discuss the category label of *koto* below.

To examine the syntactic structure of *koto* imperatives, we need to look at the *shika-nai* test. It is well known that *shika* 'only' has to occur with a clause-mate negative *nai/nakatta* (Muraki, 1978; Ueno, 2017), as demonstrated in (19). The examples in (19) are sentences with sentential complements and a clause boundary between the main and complement clauses. When *shika* 'only' is attached to the main subject or the main indirect object and a negative appears on the main verb, as in (19b) and (19c), the sentences are grammatical. Similarly, when *shika* occurs with the embedded subject or the embedded object with a negative on the embedded verb, as in (19d) and (19e), the sentences are again grammatical. When the clause-mate condition is not met, as shown in (19f) to (19i), however, the sentences become ungrammatical (Ueno, 2017, pp. 94–95). Thanks to the clause-mate condition with *shika* and a negative, the *shika-nai* test allows us to determine where the clause boundary exists.

(19) a. *X-ga Y-ni* [*Z-ga R-o hometa to*] *itta.*
X-NOM Y-DAT Z-NON R-ACC praised COMP said
'X said to Y that Z praised R.'

b. *X-shika Y-ni* [*Z-ga R-o hometa to*] *iwa-nakatta.*
X-only Y-DAT Z-NON R-ACC praised COMP said-not
'Only X said to Y that Z praised R.'

c. *X-ga Y-ni-shika* [*Z-ga R-o hometa to*] *iwa-nakatta.*
'X said only to Y that Z praised R.'

d. *X-ga Y-ni* [*Z-shika R-o home-nakatta to*] *itta.*
X-NOM Y-DAT Z-only R-ACC praised-not COMP said
'X said to Y that only Z praised R.'

e. *X-ga Y-ni* [*Z-ga R-shika home-nakatta to*] *itta.*
'X said to Y that Z praised only R.'

f. **X-shika Y-ni* [*Z-ga R-o home-nakatta to*] *itta.*

g. **X-ga Y-ni-shika* [*Z-ga R-o home-nakatta to*] *itta.*

h. **X-ga Y-ni* [*Z-shika R-o hometa to*] *iwa-nakatta.*

i. **X-ga Y-ni* [*Z-ga R-shika hometa to*] *iwa-nakatta.*

If we assume that *koto* imperatives have Uchibori's (2007) structure in (15) (repeated here as (20)), the structure with *shika* on the subject *anata* and a negative

on the verb *kuru*, as shown in (21), should be grammatical. However, (21) is ungrammatical.[13]

(20) Syntactic structure of *koto* imperatives in Uchibori (2007)
[*Ashita anata-ga hitoride kuru*] ***koto***.
tomorrow you-NOM alone come KOTO
'You come alone tomorrow!' (Uchibori, 2007, p. 295)

(21) **Ashita anata-shika hitoride ko-nai* ***koto***.
tomorrow you-NOM alone come-not KOTO
'Only you come alone tomorrow!'

On the other hand, the sentence with an explicit verb of command in (22a) shows that it is possible for *shika* to occur with an embedded subject and negation on an embedded verb. This is expected because the embedded subject and the embedded verb in (22a) are supposed to be clause-mates. However, if we remove the verb of command and turn (22a) into a *koto* imperative, as in (22b), the sentence becomes unacceptable.

(22) a. ?*Daitōryō-wa* [[*kazoku-no mono-shika sono gokuhi-shorui-ni*
President-TOP family-GEN members-only those secret-documents-DAT
sawara-nai] *koto-o meijita.*[14]
touch-not COMP-ACC ordered
'The President ordered that only family members touch these secret documents.'

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13. Ueno (2017, p. 95) claims that the epistemic structure in (17) is structurally ambiguous and has the structure given in (i), in the same way that the English *seem* occurs in the raising and non-raising structures.

(i) [*Tarō-ga bīru-o nonda*] *rashī.*
Taro-NOM beer-ACC drank seem
'It seems that Taro drank beer.' (Ueno, 2017, p. 104)

Thus, the grammatical sentence in (ii) is not a counter-argument to the structure in (17), but simply shows that (17) can also have the structure in (i).

(ii) [*Tarō-shika bīru-o noma-nakatta*] *rashī.*
Taro-only beer-ACC drink-not seem
'It seems that only Taro drank beer.'

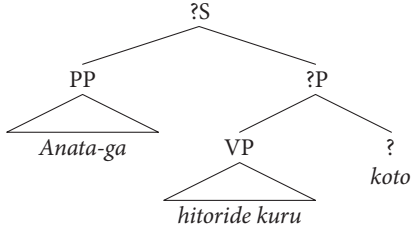
14. The sentences in (i) show that variations of (22a) are grammatical only if *shika* occurs with a negative in the same clause. This shows that in sentences with an explicit verb of command, there is a clear clause boundary between the main clause and the embedded clause, and the embedded subject stays inside the sentential complement headed by *koto*.

b. ??*Kimi-shika sono gokuhi-shorui-ni sawara-nai **koto**.
you-only those secret-document-DAT touch-not KOTO
'Only you touch these secret documents!'

The contrast in (22) shows that Uchibori's structure in (15) (= (20)) cannot be maintained. A sentence with an explicit verb of command must be structurally distinct from a *koto* imperative.

To properly capture the difference between (22a) and (22b), I argue that the syntactic structure of *koto* imperatives is similar to the structure of *rashī* 'seem' in (17) above. The proposed syntactic structure of *koto* imperatives is given in (23). In this structure, the subject of the verb *kuru* is no longer inside the clause headed by *koto*.

(23) Proposed syntactic structure of *koto* imperatives
(*Ashita) *anata-ga* [*hitoride kuru* ***koto***].
tomorrow you-NOM alone come KOTO
'You come alone tomorrow!'



Support for the structure in (23) comes from the exhaustive listing interpretation of *ga*-marked nouns. Kuno (1973) says that *ga*-marked nouns have the exhaustive

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(i) a. *Daitōryō-wa [[*kazoku-no mono-shika sono gokuhi-shorui-ni*
President-TOP family-GEN members-only those secret-documents-DAT
sawaru] *koto-o meiji-nakatta.* (not clause-mate)
touch COMP-ACC ordered-not
'The President ordered that only family members touch these secret documents.'

b. *Daitōryoō-shika [[*kazoku-no mono-ga sono gokuhi-shorui-ni sawara-nai*]
koto-o meijita. (not clause-mate)
'Only the President ordered that family members touch these secret documents.'

c. ?Daitōryō-shika [[*kazoku-no mono-ga*
sono gokuhi-shorui-ni sawaru]
koto-o meiji-nakatta. (clause-mate)
'Only the President ordered that family members touch these secret documents.'

listing interpretation, which means 'X and only X,' if they occur in main clauses. In (24a), *John-ga shinda* is a main clause. Therefore, *John-ga* in *John-ga shinda* 'it is John who died' is the only person who died. In subordinate clauses, however, the exhaustive listing interpretation is lost, as in (24b).

(24) a. Exhaustive listing interpretation of *ga*-marked nouns
Dare-ga shinda ka? John-ga shinda.
who-NOM died INT Taro-NOM died
'Who died?'
'It is John who died.' (Kuno, 1973, p. 53)

b. Loss of the exhaustive listing interpretation in subordinate clauses
[[*Kinō Tarō-ga kita*] *kadōka*] *shitteru?*
yesterday Taro-NOM came whether know
'Do you know whether Taro came yesterday?'
Not 'Do you know whether (only) Taro came yesterday?'

In the *koto* imperative in (23), it is only *anata* 'you' who has to come alone tomorrow. The subject of the *koto* imperative thus has the exhaustive listing interpretation. Therefore, the exhaustive listing interpretation supports the structure of *koto* imperatives in (23), in which *anata* is outside the constituent headed by *koto*.

In the tree in (23), the category of *koto* is left unlabeled. Before I move on to my constructional analysis, I will briefly examine the categorial status of *koto* and discuss its implications. *Koto* was originally a noun. In (25), *koto* as a noun denotes an abstract entity and is modified by adjectives and followed by particles.

(25) *Ī koto-mo warui koto-mo atta kedo, tonikaku watashi-no kimochi-wa*
good thing-also bad thing-also had but anyhow I-GEN mind-TOP
kawaranakattadesu.
did.not.change
'We had both good and bad things happening, but anyhow my mind did not change.' (BCCWJ, 2001)

It is clear that *koto* in *koto* imperatives does not denote an entity but expresses a sense of command. It also does not appear in prototypical syntactic positions for nouns, such as argument positions. However, Noda (1995) shows that *koto* in *koto* imperatives behaves like a noun when used with Sino-Japanese compounds. In Japanese, when a Sino-Japanese compound such as *shutsuba* 'to run (for an election)' occurs before another noun, the genitive marker *no* may appear in between them. A relevant example is given in (26).

(26) *Tōji-wa Asō-shi-no shutsuba-no ikō-o ibukaru*
back.then-TOP Mr. Asō-GEN run.GEN intention-ACC doubt

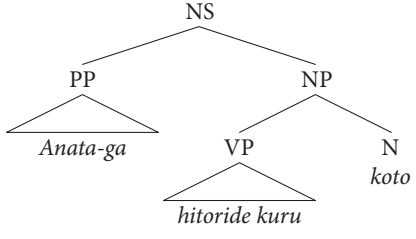
koe-mo atta…
voice-also had
'Back then, there were some voices that doubt Mr. Asō's intention to run for an election…' (BCCWJ, 2002)

In (26), the genitive marker *no* appears between the Sino-Japanese compound *shutsuba* 'to run (for an election)' and *ikō* 'intention,' because *ikō* is a noun. Therefore, whether the genitive marker *no* occurs or not between a Sino-Japanese compound and *koto* will allow us to determine whether *koto* is a noun.

The example in (27) shows that when the compound *sejō* 'to lock' appears in a *koto* imperative, the genitive marker *no* occurs between *sejō* and *koto*.[15] Thus, (27) suggests that *koto* has nominal features. The revised syntactic structure of *koto* imperatives with category information is given in (23').

(27) *Kono tobira-o kaihei-shita sai-wa kanarazu sejō-no* ***koto***.
this door-ACC open.and.close-did time-TOP always lock-GEN KOTO
'After you open and close this door, always lock it.' (Noda, 1995, p. 261)

(23′) Structure of *koto* imperatives (revised)
(*Ashita) anata-ga* [*hitoride kuru koto*].
tomorrow you-NOM alone come KOTO
'You come alone tomorrow!'



The structure proposed in this paper in (23′) accommodates not only the results of the *shika-nai* test and the exhaustive listing interpretation but also the fact that *koto* imperatives do not allow the *ga-no* conversion and that *koto* behaves like a noun when it occurs with Sino-Japanese compounds. Relevant examples will be presented below; they provide further evidence for the syntactic analysis presented here, which contrasts with Uchibori's (2007) analysis.

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15. As a reviewer pointed out, imperatives with explicit verbs of command do not allow the genitive marker in the same context.

It is not clear why *koto* imperatives gain nominal features. However, this is another syntactic difference between imperatives with explicit verbs of command and *koto* imperatives.

In Japanese, the nominative marker *ga* can become the genitive marker *no* when a *ga*-marked noun occurs in a clause headed by a noun. A prototypical example of the *ga-no* conversion is given in (28).

(28) a. *Katsute nanninmo* [$_{N}$ [$_{S}$ *Nihongo-no jōzuna*] *Amerikajin*]*-to*
before many Japanese-GEN good American
deatta ga,…
meet but…
'I have met many Americans who are proficient in Japanese, but…'
(BCCWJ, 2003)

b. *Katsute nanninmo* [$_{N}$ [$_{S}$ *Nihongo-ga jōzuna*] *Amerikajin*]*-to deatta*
NOM
ga,…

Pointing out that *koto* imperatives do not allow the *ga-no* conversion, as in (29), Uchibori (2007) concludes that *koto* is not a formal noun and does not have nominal features.

(29) *Ashita anata-ga/*no hitoride kuru* ***koto***.
tomorrow you-NOM/GEN alone come KOTO
'You come alone tomorrow!' (Uchibori, 2007, p. 301)

Uchibori's argument goes as follows: (1) *anata-ga/anata-no* in a *koto* imperative is inside a clause headed by *koto,* as in (30); (2) if *koto* has nominal features, the *ga-no* conversion should be possible, but it is not; and therefore, (3) *koto* does not have nominal features.

(30) Uchibori's (2007) structure
[*Ashita anata-ga/*no hitoride kuru*] ***koto***.
tomorrow you-NOM/GEN alone come KOTO
'You come alone tomorrow!' (Uchibori, 2007, p. 301)

However, Noda's (1995) example in (27) empirically refutes Uchibori's third point and shows that *koto* in *koto* imperatives has nominal features: as the genitive marker *no* is acceptable, it must be that the following item is a noun.

In this paper, the syntactic structure of *koto* imperatives is not (30) but (31).

(31) Structure proposed in this paper
*Ashita anata-ga/*no* [*hitoride kuru* ***koto***].
tomorrow you-NOM/GEN alone come KOTO
'You come alone tomorrow!'

In (31), *anata-ga/anata-no* is not inside the clause headed by *koto* and is not in the environment where the *ga-no* conversion should take place. Thus, the structure proposed in this paper accommodates not only the results of the *shika-nai* test

and the exhaustive listing interpretation, but also the *ga-no* conversion and *koto*'s nominal behaviors with Sino-Japanese compounds without stipulations.[16]

To summarize the semantic and syntactic properties of *koto* imperatives, the *koto* construction has the meaning of an imperative (Section 2.1). Syntactically, *koto* imperatives appear in the raising-to-subject structure in the same way as other modal sentences (Section 2.2). This means that both the semantic and syntactic properties of *koto* imperatives are different from those of sentences with overt verbs of command. In the next section, I will present a constructional analysis to account for the properties of *koto* imperatives discussed in this section.[17]

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16. Koyo Akuzawa (personal communication) has pointed out that the example with a Negative Concord Item *daremo* 'anyone' in (i) could be a problem for (23').

(i) *Kyūjitsu-ni-wa* *shigoto-ni* *daremo* *ko-nai* ***koto!***
weekend-during-CONT work-to anyone come-not KOTO
'No one comes to work during the weekend!'

Normally, for *daremo* to be interpreted as 'no one,' *daremo* and a negative must be clause-mate, as shown in (ii).

(ii) **Taro-wa* [*kyūjitsu-ni-wa* *shigoto-ni* *daremo* *kuru*]
Taro-TOP weekend-during-CONT work-to anyone come
koto-o *shira-nakatta.*
COMP-ACC know-not
'Taro knew that no one would come to work during the weekend.'

It is not clear why (i) is perfectly grammatical. I will have to leave the interpretation of *daremo* in *koto* imperatives for future research.

17. There is another construction that involves *koto* in sentence-final position:

(i) *Maa* *oishisoo* *desu* *koto!*
wow delicious.looking POL KOTO
'Wow, that looks delicious!' (BCCWJ, 2004)

The exclamative *koto* (or the mirative *koto,* according to Shimada and Nagano [2017]) in (i), which is attested already in Old Japanese (Wrona, 2011), looks similar to *koto* imperatives. However, I assume that *koto* exclamatives and *koto* imperatives are different because (1) the meanings of exclamative and imperative are quite different; (2) *koto* exclamatives allow polite forms, such as *desu* in (i), but *koto* imperatives do not; and (3) the *ga-no* conversion is allowed in (i), but not in *koto* imperatives (see (31)).

Although I assume that *koto* exclamatives and *koto* imperatives are different, it is interesting to note that Shimada and Nagano (2017) suggest that "Both *koto* and *no* started as nominals and were grammaticalized into complementizers, that is Fin [finite] heads, and then further grammaticalized into focus particles as IFoc [information focus] head" (p. 236). In light of the constructional analysis that I pursue below, where different constructions are expected to interact, it is quite intriguing that both *koto* exclamatives and *koto* imperatives appear to follow a similar path. However, I will leave the questions of whether and how these constructions interact for future research.

3. *Koto* imperatives as an instance of constructionalization

To explain the properties of *koto* imperatives and the differences between *koto* imperatives and sentences with an explicit verb of command, I propose that *koto* imperatives went through the following process:

(32) a. Initially, an explicit verb of command was omitted and the hearer inferred the meaning of command of the elided verb from the context.
b. Through pragmatic strengthening, *koto* itself took on a meaning of command. This meaning of command began to be associated with *koto* itself, rather than with an elided verb of command. This is the emergence of *koto* imperatives (constructional change).
c. As the association of the meaning of command with *koto* became conventionalized, *koto* imperatives became categorized as a member of the set of imperatives. As part of this set, *koto* imperatives were *sanctioned* (in the sense of Langacker, 1987 and Traugott & Trousdale, 2013) by the schema of the modal construction and inherited its syntactic structure.

Okamoto (1995) has already described the change between (32a) and (32b). While this change semantically separates *koto* imperatives from the construction with explicit verbs of command, it is still only an instance of constructional change which affects only one dimension of a construction and does not involve the creation of a new sign (Traugott & Trousdale, 2013, p. 26). However, a close examination of the syntactic properties of *koto* imperatives suggests that more changes took place. Namely, as the imperative meaning was conventionalized for *koto* imperatives, speakers gave *koto* imperatives a "neoanalysis" in the sense of Traugott and Trousdale (2013, p. 21), categorizing them as a type of imperative/modality expression and associating them with the modal construction.

This modal construction has the semantics of modality and the syntax of the raising-to-subject structure. Because the network of constructions is in flux, when the hearer heard *koto* imperatives, he matched the meaning of *koto* imperatives with the syntactic structure of other modality expressions and formed a new link between *koto* imperatives and the modal construction. As Trousdale (2013, p. 511) points out, this way of thinking about language change is possible only if one assumes that "language consists of a network of constructions." Without the concept of a network of constructions, the inheritance of the syntactic information from the modal construction by *koto* imperatives will be neither predicted nor explained.[18]

18. A reviewer pointed out that if the change in (32a) and (32b) took place in both semantics (i.e., less authoritative meaning) and syntax (i.e., command verb elision), then the change in (32a) and (32b) constitutes an instance of constructionalization and the change in (32b) and (32c) post-constructionalization (Trougott and Trousdale, 2013, p. 28). Because it is possible to

With the inheritance of syntactic information from the modal construction, *koto* imperatives have taken on the new meaning of command and a new syntactic structure, that of the modal construction. *Koto* is thus no longer a nominal complementizer, but a new sign. Therefore, I conclude that *koto* imperatives are a clear instance of constructionalization (Traugott & Trousdale, 2013, p. 1).[19]

The inheritance relationships among the explicit verb of command construction, the modal construction, and the *koto* imperative construction are given in Figure 1. Here, the *koto* imperative construction has two parents: the explicit verb of command construction from which the *koto* imperative construction has developed and the modal construction from which the *koto* imperative construction (and the *rashī* construction as well as other modal constructions) inherited syntactic and semantic properties. These constructions "are linked by inheritance relationships which motivate many of the properties of particular constructions" (Goldberg, 1995, p. 67). Although the *koto* imperative construction superficially resembles the explicit verb of command construction, the *koto* imperative construction inherits many of the syntactic and semantic properties of the modal construction. The thickness of lines reflects the strength of the inheritance relationships.[20]

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elide items that are clear from the context in Japanese, it is not easy to demonstrate the formal difference between (32a) and (32b). In this paper, I show that *koto* imperatives went through a semantic change (i.e., less authoritative meaning) and a syntactic one (i.e., raising-to-subject structure), constituting a clear instance of constructionalization. Whether more steps of constructionalization have occurred awaits further research.

19. Although close examinations of the timeline of these changes are beyond the scope of this paper, *Nihonkokugo Daijiten*, a Japanese language dictionary, lists the following earlier examples of *koto* imperatives:

(i) *Midarini hito-o korosu bekarazaru koto.*
recklessly people-ACC kill should.not KOTO
'Do not kill people recklessly.'
(from *Arte da Lingoa de Iapam*, 1604–1608 [my translation])

(ii) *Sāsā minna-ga neru koto neru koto.*
quick everybody-NOM sleep KOTO sleep KOTO
'Quick! Everybody, sleep! Sleep!'
(from *Seiyō Dōchū Hizakurige*, 1870–1876 [my translation])

Nihonkokugo Daijiten also lists other uses of *koto*. Earlier examples of *koto* as a noun are from the *Manyōshū* (8th century; *Collection of Ten Thousand Leaves*). The examples of the exclamative *koto* (cf. Footnote 17) are from *Taketori Monogatari* (9th century; *Tale of the Bamboo Cutter*) and *Ise Monogatari* (10th century; *Tales of Ise*). Therefore, the descriptions in *Nihonkokugo Daijiten* may also suggest that the analysis presented in this paper is valid.

20. For a similar diachronic constructional analysis of Japanese conditional imperatives, see Kikuta (2018).

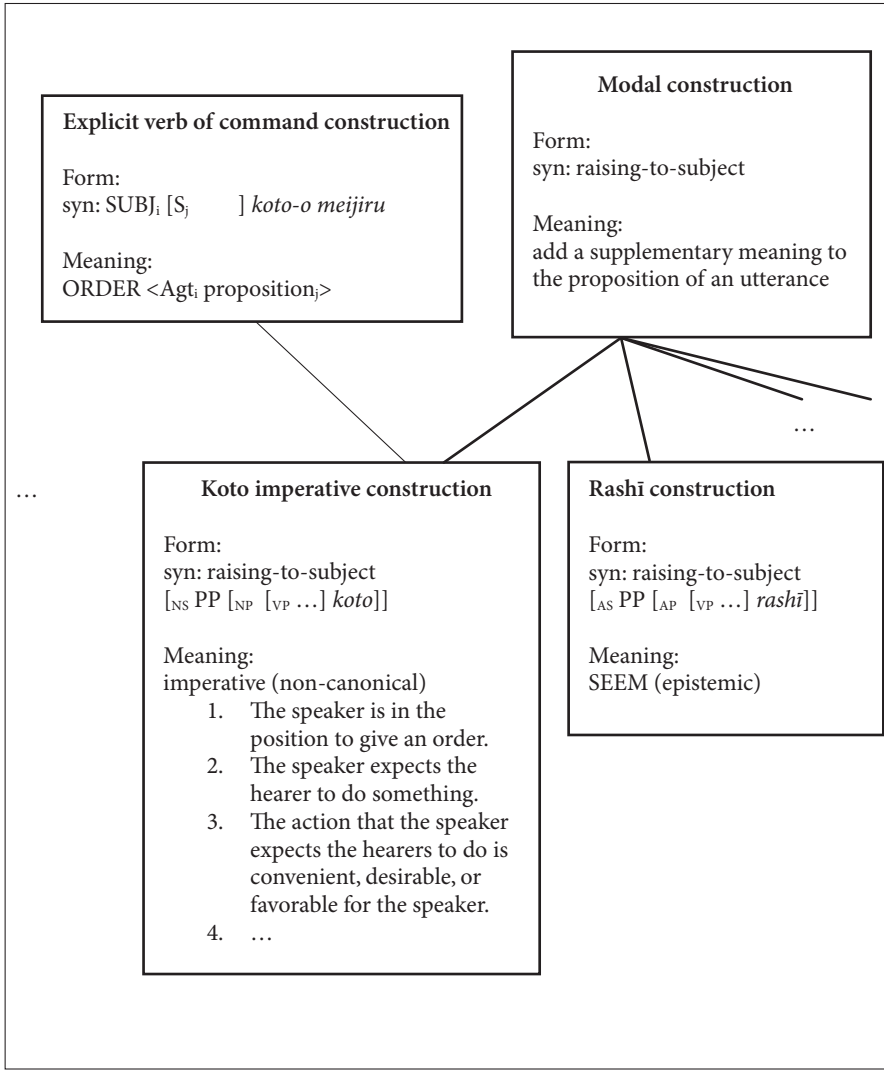

Figure 1. The inheritance relationships around the *koto* imperative construction in Japanese[21]

21. Although the difference does not affect the present argument, the two inheritance links from the parent constructions to the *koto* imperative construction are different: The one from the explicit verb of command construction is a subpart link, and the one from the modal construction is an instance link. I thank the reviewer for pointing this out.

One of the questions posed for this volume was the following: If the actual developments of modal expressions are viewed through the lens that Traugott and Trousdale (2013) provide, what new insights can be gained (Hilpert et al., this volume)? Now that I have argued that *koto* imperatives are an instance of constructionalization, I will briefly address this question of constructionalization and the development of modal expressions in the final section of this paper.

4. Suspended clauses

In this paper, we have seen that the changes in *koto* imperatives did not stop when they acquired the imperative meaning through pragmatic strengthening. Their new semantics promoted a neoanalysis and the inheritance of the syntactic structure from the modal construction, which turned *koto* imperatives into a new sign and an instance of constructionalization. Traugott and Trousdale (2013, p. 29) say that changes observed in constructionalization are often observed as part of larger systemic shifts. If we look beyond *koto* imperatives, we find that the change of the *koto* complement from a type of subordinate clause to an independent clause with modal meaning is not an isolated phenomenon. To demonstrate this, I will briefly discuss how *koto* imperatives may be situated in the broader systematic development of Japanese modality and suggest a potential contribution of the notion of constructionalization to studies of Japanese modality.

In Japanese, indirect communication is favored; the speaker is motivated to leave some things unsaid, and the hearer is encouraged to infer the meaning of the unsaid. This culturally motivated practice of omitting and inferring has prompted the development of new constructions from a variety of complex sentences. Ohori (1995; 1997; 2006) calls them suspended clause constructions.[22] Examples from Ohori, (1995, p. 203) are given in (33).

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22. Similar phenomena are also discussed under other terms, such as Evans's (2007) insubordination and Shirakawa's (2009) *īsashi-bun*. The definitions of insubordination and *īshashi-bun* are given below:

(i) Evans's (2007, p. 367) insubordination
'I will apply the term 'insubordination' to *the conventionalized main clause use of what, on prima facie grounds, appear to be formally subordinate clauses*.'

(ii) Shirakawa's (2009, p. 1) *īsashi-bun*
'In this book, *īsashi* is contrasted with *īkiri* 'a complete (sentence)' and refers to utterances expressed by syntactically incomplete sentences which lack main clauses. I will target only the utterances that express contents completely, just like complete sentences.' (translation mine)

(33) a. *Ja sure-ba.*
then do-BA
'Then, please.'
[BA is normally glossed as 'conditional' or 'provisional.']

b. *Itte kurere-ba ageta-noni.*
say give-BA gave-NONI
'(I)'d have given (it to you) if (you) requested.'
[NONI is a concessive connective, normally glossed 'although.']

c. *Daremo tasuke-ya shi-nai-toiu.*
anybody help-PRT do-not-TOIU
'(The story) is nobody helped (me).'
[TOIU is a kind of complementizer, analyzable as *to* (=COMP) and *iu* (='say,' noun-modifying ending). As such, it is used for noun complementation with the structure S-*TOIU* N, 'such N that S.'] (Ohori, 1995, p. 203)

The sentence in (33a) is reduced from an idiomatic expression, V-*ba ī* 'to do V would be fine.' The example in (33b) is reduced, as the pragmatic inferences of the subordination marker *noni* are conventionalized. The source of (33c) involves a complementizer. The head noun is reduced in this case. After these suspended clauses have been reduced from the complex source structures, they often gain new modality meanings: They "have their own discourse functions that are not manifest in a non-suspended version" (Ohori, 1995, p. 216), and they "carry directive and expressive functions" (Ohori, 1997, p. 473).[23] For example, Ohori (1995, p. 208) explains the meaning of *noni* in (33b) as follows:

> Here, NONI no longer codes any logical relation between the linked clauses, but marks *some aspect of the participant's involvement* [emphasis added] in the conversational context. The pragmatic effects of such suspended clauses are not easy to describe, but, generally speaking, the effect of NONI may be rendered approximately, 'Alright, but the due consequence has not followed in reality, you know.' In (13) [(33b) in this paper], the 'due consequence' is the teacher's giving a copy of his book to his student. In this example, there is only a feeling of weak regret in the teacher's utterance.

One of the unique characteristics of suspended clauses is that they often involve inference-intensive readings (Ohori 1997, p. 475). That is, when the full structure has

23. Evans (2007) and Shirakawa (2009) also associate meanings in insubordination and *īsashi-bun* with modality. For example, Evans (2007) says the following about insubordination:

> Another widespread use of insubordination is to express various kinds of modal meaning, both epistemic – having to do with belief, truth, knowledge about the proposition – and deontic, i.e. 'concerned with action, by others and by the speaker himself' (Palmer 1986: 96) to bring about a state of affairs denoted by the proposition. (p. 394)

multiple readings, only the reading with a strong inference emerges in its suspended clause counterpart. For example, Ohori (1997, pp. 475–476) reports that the marker *shi* may have both an (inference-intensive) reason reading and a more neutral temporal reading when used with an overt main clause, as shown in (34a) and (34b). In (34a), by providing her age as a reason for the difficulty of the task in question, the speaker asserts the difficulty clearly and declines to do the job. The marker *shi* in (34b) with a neutral temporal reading merely juxtaposes two propositions. However, the suspended version in (35) only has a reason reading: The speaker expects the hearer to infer her situation (e.g., she does not have enough energy to do something) from the explanation she provides (i.e., she is getting old) and show sympathy. Evans (2007, p. 387) claims that not expressing a main clause has "the effect of putting the face-threatening act 'off the [*sic*] record.'" In (35), by omitting the main clause ('I cannot do this job'), the speaker mitigates her face-threatening act of declining. If the motivation for not expressing a main clause and using suspended clauses is to mitigate face-threatening acts, it is understandable why suspended clauses are often associated with readings with stronger inferences.

(34) a. *Watashi-mo ī toshi desu-shi, kono shigoto-wa dekimasen.*
I-also good age be-SHI this job-TOP cannot.do
'I have become very old, and I can't do this job (=Because I have become very old, I can't do this job).' (reason reading)

b. *Watashi-mo ī toshi desu-shi, otto-wa mamonaku teinen desu.*
I-also good age be-SHI husband-TOP soon retire be
'I have become very old, and my husband is retiring soon.' (temporal reading) (Ohori, 1997, pp. 475–476)

(35) *Watashi-mo ī toshi desu-shi.*
I-also good age be-SHI
'I have become very old-SHI [and].' (reason reading) (Ohori, 1997, p. 475)

Interestingly, *koto* imperatives show the same pattern of inference-intensive reading as the other suspended clauses. When it does not occur in sentence-final position, the complementizer *koto* occurs in a variety of contexts. For example, in (36a), 'going to New York' is described as something that was experienced. In (36b), 'going to New York' is something that the speaker decided to do.

(36) a. *Nyūyōku-e iku koto-ga yoku aru.*
New York-to go KOTO-NOM often exist
'I often go to New York.'

b. *Nyūyōku-e iku koto-ni shita.*
New York-to go KOTO-DAT did
'I decided to go to New York.'

When *koto* occurs sentence-finally, as in (37a), however, it does not evoke the meaning of experience or decision. It only expresses a command. Describing experience or decision, as in (36), is not a face-threatening act, but ordering others with a verb of command, such as *meijiru*, as shown in (37b), is. Because the sentences in (36) are not face-threatening, the speaker does not have a reason to try to make them less face-threatening by omitting their main clauses. On the other hand, to make commands like (37b) less face-threatening, there is a good reason for the speaker to omit the command verb and to use a less-explicit structure, such as (37a). It can be said that *koto* imperatives, as in (37a), are the result of the speaker's desire to mitigate a face-threatening act, just like with the suspended clause in (35) above.

(37) a. *Nyūyōku-e iku koto.*
New York-to go KOTO
'Go to New York.'
b. *Nyūyōku-e iku koto-o meijiru.*
New York-to go KOTO-ACC order
'I order you to go to New York.'

If the reason behind the interpretation of other suspended clauses has played a role in the development of *koto* imperatives, it is possible that *koto* imperatives, which were reduced from a complex structure to a simplex structure with modality meaning, should be considered a member of suspended clauses.[24]

In Section 2, I have argued that changes in *koto* imperatives go beyond the reduction of complex sentences to simplex sentences. They took on not only imperative meaning but also the syntax of the raising-to-subject structure. If *koto* imperatives are part of a major shift from complex sentences to independent sentences with modal meaning, as illustrated by suspended clauses, this paper suggests that constructionalization may take place or may be taking place not only in *koto* imperatives but also in other suspended clauses.[25] Discussions of suspended clauses have tended to focus on whether they should be explained as instances of ellipsis

24. As Seiko Fujii (personal communication) has pointed out to me, the extent to which *koto* imperatives are conventionalized is probably greater than for other suspended clauses. If other suspended clauses are in the process of constructional change (equivalent to (32a) and (32b)), it is understandable that *koto* imperatives appear to be more conventionalized because they have undergone the process of constructionalization (32c).

25. Seizi Iwata (personal communication) has pointed out that suspended clauses are mainly observed in spoken language, while *koto* imperatives appear to be more of a written language phenomenon. The properties of *koto* imperatives and those of suspended clauses may not match entirely. However, it would still be interesting to examine whether many structures that are gaining new modal meanings are going through the process of constructionalization just as *koto* imperatives did.

(Masuoka & Takubo, 1992), on whether the items that appear at the sentence-final position should be categorized as sentence-final particles (Takahashi, 1993), or on whether they should be understood as independent constructions due to the loss of an original main clause (Ohori, 1995; Ohori, 1997; Ohori, 2006; Shirakawa, 2009). While a full discussion of this question is beyond the scope of this paper, the current analysis suggests the possibility that suspended clauses that were reduced from complex sentences and gained modal meaning undergo the process of constructionalization through the interaction of suspended clauses and the modal (raising-to-subject) construction. If such is the case, constructionalization plays a bigger role in the development of modality expressions in Japanese.[26]

5. Concluding remarks

In this paper, I have further developed Okamoto's (1995) analysis of *koto* imperatives and shown that *koto* imperatives took on not only the meaning of command but also adopted the raising-to-subject structure as their new syntactic structure. This occurred when the hearer matched the meaning of *koto* imperatives with the syntactic structure of other modal structures ("neoanalysis"). Because *koto* imperatives are now associated with a new meaning of command and a new syntactic structure, they constitute a new sign, which is an instance of constructionalization. I have also suggested the possibility that constructionalization may be observed in other modal expressions in Japanese. Suspended clause constructions, which changed from a type of subordinate clause to an independent clause with modal meaning, share with *koto* imperatives the involvement of inference-intensive readings. If *koto* imperatives are a member of the class of suspended clauses, it is possible that the type of constructionalization that we have seen in this paper may be seen with other suspended clauses and plays a bigger role in Japanese modality expressions.

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26. A reviewer pointed out that that some suspended clauses may also bear imperative functions:

(i) *Menbā-wa minna kichinto kodo-suru yōni/no!*
Member-CONT all properly act-do YŌNI/NO
'All members act properly!'

In (i), the complementizers *yōni* and *no* occur at the end of the sentence. The sentence expresses the sense of command. However, compared to *koto* imperatives, *yōni/no* suspended clauses are more colloquial (see Footnote 30) and appear to be less conventionalized (see Footnote 29). The questions of how *koto* imperatives differ from other imperatives, including the ones involving other suspended clauses, and how different constructions form a system of imperatives in Japanese will be addressed in further research.

Without the right approach, the properties of *koto* imperatives seem erratic and disorganized. The Construction Grammar elucidates the seemingly irregular properties of *koto* imperatives and gives a coherent explanation as to why they behave as they do.

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Abbreviations

ACC	(usative)	INT	(errogative)
COMP	(lementizer)	NOM	(inative)
CONT	(rastive)	PAR	(ticle)
DAT	(ive)	POL	(ite)
GEN	(itive)	TOP	(ic)

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This volume explores how Diachronic Construction Grammar can shed new light on changes in a central and well-researched domain of grammar, namely modality. Its main goal is to show how constructional analyses can help us address some of the long-standing questions that have informed discussions of modal expressions and their development, and to illustrate the processes that are involved in these developments on the basis of data from languages such as English, Finnish, French, Galician, German, and Japanese. The studies in this volume are organized around three interrelated topics. The first of these concerns the organization of modal constructions in a network. A second focus area of the studies in this volume concerns the developmental pathways that modal constructions follow diachronically. The third topic that ties the contributions of this volume together is the contrast between constructionalization and constructional change.

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