DE GRUYTER
MOUTON

Jacques Moeschler

NON-LEXICAL PRAGMATICS

TIME, CAUSALITY AND LOGICAL WORDS

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To Anne

Foreword

This book has a long history. A couple of years ago, I suggested to Istvan Kecskes that I write a book relating to my research on negation, tenses and connectives. I spent several years developing what I had in mind, with the support of research projects from the Swiss National Science Foundation. Thanks to the Faculty of Letters, University of Geneva, I finally found the time to think about and expand upon this project over the course of a whole sabbatical semester.

Over the last twenty years, I have pursued two goals: first, to develop a sound description of the semantic issues of tenses, connectives and negation; second, to elaborate a robust theoretical framework able to account for these data.

What struck me in pragmatics was the lack of detailed descriptions supporting theoretical claims. A second puzzle was the disconnect between descriptive works and theoretical tools. For about twenty years, empirical domains like tenses and connectives have been popular topics of investigation in pragmatics; but most of the time, they have been disconnected from the tools developed since the Gricean turn, with concepts like implicature and presupposition frequently unused in the literature. The only new and original theoretical contribution was the conceptual vs. procedural meaning distinction.

This book aims to connect empirical and theoretical issues. The main hypothesis is that the markers under investigation (tenses, connectives and negation) all share a number of different conceptual and procedural meanings contributing to entailment, explicature and implicatures, aspects of meanings which relate to speaker meaning for some of them.

This hypothesis can bear fruit not only at the descriptive but also the theoretical level. If I am right, there should be irrefutable connections between the linguistic system and the types of inference required for verbal communication to succeed. My hope is that this book will help to resolve – if only partially – the entanglement of conceptual and procedural meaning.

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Abstract

This book is about the pragmatic meaning of the functional lexicon. We investigate tenses, causal connectives, logical connectives and negation. The main claim is that meaning is distributed between conceptual information and procedural information, whatever the type of functional unit. The issue of the type of meaning encoded in the functional lexicon raises the question of their contribution to semantic and pragmatic meanings, entailment, presupposition, explicature and implicature. The book presents a first account of such meaning relations, a description of the contribution of tenses, connectives and negation as regards conceptual and procedural meanings, and addresses with new conceptual tools the semantics-pragmatics interface issue. In the conclusion, a more general question is addressed, meaning evolution. The prediction is that meaning change is mainly located in procedural meaning rather than into conceptual one.

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Part II: **Time and tenses**

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Introduction

1 Why write this book?

This book is about pragmatics, and in particular the pragmatic approach to certain linguistic categories defined as non-lexical. By non-lexical pragmatics, I refer to a domain of pragmatic theory dealing with non-lexical units; this excludes classical lexical categories such as verbs, nouns and adjectives, the open classes of the lexicon. Non-lexical pragmatics thus deals with the functional lexicon, negatively defined as non-lexical, and positively as referring to the lexicon's closed classes. The functional lexicon includes conjunctions, determiners, prepositions, logical operators (like negation, quantifiers and logical connectives) and tenses. In this book, I restrict my attention to tenses, connectives and logical words (negation and logical connectives).[1]

I chose to write a book on non-lexical markers because most substantive contributions to the relevant domains (tenses, connectives and logical words) appear in articles in peer-reviewed journals. Although there have certainly been pragmatics textbooks which have considered these phenomena, monographs are rare, and thus unique in the extent to which they contribute to knowledge. The ambition of this monograph is twofold: first, I would like to shed new light on the semantics and pragmatics of tenses, connectives and logical words; and second, I would like to discuss a unified approach to pragmatics, one with sufficient empirical coverage. Such an enterprise may not be obvious, as there are already extensive studies on tenses, connectives and negation which contribute to pragmatic theories such as Relevance Theory – for instance, Blakemore (1987), Iten (2005) on connectives, Saussure (2003) on tenses, and last but not least, Horn (1989) on negation in a neo-Gricean framework. Instead, this book is written in the hope that it will add value to the debate by creating a unified approach to tenses, connectives and logical words, the relevant and significant meanings triggered by non-lexical expressions, rather than by providing an alternative descriptive point of view, or a new theoretical framework. In so doing, it is less ambitious at the descriptive and theoretical levels, but more ambitious with respect to the semantics-pragmatics interface.

At present, certain basic concepts of pragmatic theory, mainly implicature and presupposition, are absent from most descriptions of tenses and connectives.

1 Quantifiers will not be discussed here. See Moeschler (2017) for a precise discussion about analysis of *some* and *some . . . not*.

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As far as negation is concerned, the distinction between descriptive and metalinguistic negation – first proposed by Horn (1985, 1989) following proposals in French by Ducrot (1980, 1984) – afforded a central role to implicature and presupposition, as discussed in Moeschler (2018a, 2019). However, tenses' pragmatic contribution to utterance meaning is generally disconnected from the issue of implicature, instead involving the concept of *procedural* meaning (Wilson and Sperber 1993), just like the analysis of connectives.

Briefly put, it is true to say that pragmatic theory, originating from the seminal work by Grice (1989), did not have a significant impact on tenses and connectives, the most frequently investigated domains in pragmatics. Pragmatic theory has developed sound and tested approaches to implicatures, mainly scalar implicatures (Noveck and Sperber 2004, Noveck and Reboul 2008, and Zufferey, Moeschler, and Reboul 2019 for a synthesis), and principally involving quantifiers (*some* vs. *all*). As for tenses, one experimental work on dyslexia (Fiorin 2010) has sought to use the scalar implicature paradigm to explain the contrast between two past tenses in Italian – *Imperfetto* vs. *Passato Prossimo*, corresponding broadly to the English Past Progressive and Present Perfect opposition. The *Imperfetto* is the weak form in the scale, implicating negation of the complete action described by the *Passato Prossimo*. Such an analysis dealing with the contrast between forms has been proposed in Levinson (2000) – for instance, the meta-scale <reflexive, non-reflexive> for pronouns like <*himself*, *him*>, where the choice of non-reflexive pronouns implicates the non-reflexive reading (Levinson 2000, following Reinhart 1983).

Within a different theoretical framework originating from cognitive semantics, causal connectives' meaning is linked to presupposition, but in a non-technical or loose sense: "causal relations presuppose additive relations" (Sanders and Noordman 2000: 44), which means that *p because q* presupposes *p and q*. Finally, if we take the example of other discourse connectives like *therefore* and *but*, the description has been in terms of conventional implicature, which is conventional non-truth-conditional meaning (Grice 1989, Levinson 1983).

So, the empirical domain investigated in this book can be described by the classical concepts of pragmatics: presupposition and implicatures (conventional and conversational). However, this short survey of some of the best-known proposals conceals more complex issues; all these proposals are very general, and empirically inadequate. In the next section, I present some aspects of the complexity of the descriptions for tenses, connectives and negation.

2 Descriptive issues

One of the main characteristics of the three relevant domains – tenses, connectives, and logical words – is their extreme sensitivity to context; they have a non-fixed meaning that varies according to contextual factors. One of the main issues for the description of tenses is their variation in use. Any traditional grammar will list a set of examples which give an inconsistent picture of the tense meaning. The French *Imparfait*, for example, has many unrelated uses (descriptive, narrative, conditional, play-related, iterative, etc.) which cannot be reduced to an obvious and immediate fixed meaning. Even the past meaning is inappropriate for the play-related and polite uses, as in (1) and (2):

(1) *J'étais le papa, et toi la maman.*
I was the daddy and you the mummy
'I was daddy, and you mummy.'

(2) *Je voulais vous demander si vous acceptez*
I wanted you ask whether you accept
mon sujet de thèse.
my topic of thesis
'I wanted to ask you whether you would accept my PhD proposal.'

These examples are not restricted to a specific tense like the *Imparfait*, nor to a specific language like French. The explanation is that tenses, like other functional markers, vary in meaning. Another example of such variation comes from spatial prepositions, where the proliferation of uses calls into question their core meaning (see Lakoff 1987 for a similar issue linked to the variation of meaning of the English preposition *over*). In a different manner, although with a similar outcome, variation of meaning can be seen as a general issue for lexical categories too, as lexical pragmatics has shown (Wilson 2003, Wilson and Carston 2007). In lexical pragmatics, narrowing and broadening are just the types of meaning specification and extension that highlight the relation between linguistically encoded meaning and contextually inferred meaning. Is linguistic meaning connected to contextual meaning? And if so, how can a general theory of language use explain firstly how addressees manage to derive the appropriate reading, and secondly why languages are systems that show such discrepancies between semantics and pragmatics?

Of course, the same issue arises with connectives. A very illuminating and extensive illustration is given in Bruxelles et al. (1980), which analyses all the examples of French *mais* used in a play by Feydeau (*Occupe-toi d'Amélie*).

Descriptive studies of connectives tend to conclude that what defines their meaning is neither descriptive nor conceptual, but instructional, i.e. procedural. The semantic meaning of a connective is thus a general template which, when applied to a specific context, yields different outcomes. The same strategy, whatever the general theoretical background, can be described as follows:

Meaning of connectives

a. Connectives have different meanings in use, but one semantic meaning.
b. The semantic meaning is a set of instructions for the use of a given connective in a given context.
c. The generation of the meaning in use is derived from the core meaning, i.e. the set of instructions of the connective.

The instructional nature of the meaning of connectives, compared to the variation of meaning of lexical units, raises the question of the nature of lexical meaning. Traditional lexical approaches to semantics, such as that in Levin (1993), describe lexical meaning as based on semantic components, concepts which combine to build a complete lexical meaning. According to a traditional pragmatic approach, too, lexical meaning is defined as conceptual, whereas non-lexical meaning is non-conceptual, and so procedural.

In a nutshell, the classic picture divides the lexicon into two complement sets: lexical categories with conceptual meaning; and non-lexical categories with procedural meaning. However, this analysis has been challenged by the following assumptions:

a. First, some pragmatic approaches to semantic meaning, such as Ducrot's *integrated pragmatics* (Anscombre and Ducrot 1983), analyse the descriptive meaning of lexical units as the result of a pragmatic process, since Benveniste (1966) termed *délocutivité* 'delocutivity': for instance, the property of being INTELLIGENT is the result of the use of the lexical item *intelligent* in an act of argumentation, which is positively oriented and argues for a positive conclusion (Ducrot 1981). In other words, the "objective" or descriptive meaning of *intelligent* is not a property but the result of an argumentative orientation. For Ducrot, the argumentative orientation is a semantic primitive, whereas the descriptive meaning is the *delocutive* result of language use.
b. Second, analogous reasoning has come from a different, cognitive, perspective. For instance, the meaning of the verb *open* which varies in context is constrained by its internal arguments (*open the window, one's mouth, a book, a briefcase, the package, the wound*, etc.). According to Carston's explanation (Carston 2002: 65), based on Searle's description of literal meaning (Searle 1979), the interpretation of *open* "is only so given a Background

of assumptions concerning what is involved in an X opening a Y". For Searle, "the notion of literal meaning of a sentence only has application relative to a set of contextual or background assumptions" (Searle 1979: 117). The question is how core and pragmatic meanings interact. As the example of *open* shows, it is difficult to assign a basic conceptual meaning to an expression; the more specific and multiple the usages, the less specific or determined the semantic meaning. So, from a practical perspective – one relevant to acquisitional or computational approaches to lexical meaning – the issue is what core meaning might be.

c. Third, this issue is yet more crucial for a pragmatic theory of concepts, like Relevance Theory, where the core distinction is between the encoded concept and the inferred concept. Easy cases, with clear entailments as part of the logical entry of the concept (Sperber and Wilson [1986] 1995), show classical set relations between the encoded and the inferred concept. For instance, the inferred *ad hoc* concept BACHELOR* describes a subset of the encoded concept BACHELOR, selecting according to its encyclopaedic entry (for instance, YOUNG, ELIGIBLE FOR MARRIAGE), whereas the ad hoc concept RAW*, applied to a steak, rules out its logical entry (RAW(x) → NOT-COOKED(x)) since the inferred concept means INSUFFICIENTLY COOKED. But as soon as complex concepts intervene, as in metaphors, it becomes much harder to explain how a certain property is selected as appropriate (think about "being a chameleon" for a human being, Reboul 2014).

d. Last but not least, what would be the argument for a straightforward separation between conceptual and procedural meaning if the tested expressions are not discourse connectives but logical connectives or tenses? For tenses, can we assume that basic temporal concepts like PAST, PRESENT or FUTURE are absent from the temporal meaning of tenses? Or must we interpret them as procedural – that is, as instructions for computing time in discourse? And what about connectives? Is it possible that causal connectives do not refer to a concept like CAUSE, and connectives such as *and, or* and *if* are detached from logical concepts such as conjunction, disjunction and material implication?

Considering these issues in the round, there are manifestly connections between encoded concepts and inferred concepts. But the issue of procedural meaning – that is, the nature of non-descriptive meaning – is open, and must be investigated in relation to its conceptual twin. This is not a conclusive outcome, but the point of departure for a new empirical investigation of non-lexical meaning. How, precisely, are conceptual and procedural meaning intertwined? The prediction is that what makes tenses and connectives complex in their uses, as well as

different from language to language, lies in the very close connection between their conceptual and procedural meanings. This assumption will be developed extensively in this book, and will be more precisely formulated in Chapter 2.

However, the first issue in this introduction must be addressed. What is the relationship between different types of meaning, such as presupposition, implicatures, entailments and explicatures, and the conceptual and procedural meanings attached to tenses, connectives and negation? Chapter 1's discussion of the different types of meaning will provide an initial answer which can be summarized in a single sentence: pragmatic meaning, like explicature and implicature, has propositional content, and so is conceptual in nature.[2] What has been traditionally ascribed to procedural meaning is thus constrained by the nature of the conceptual meaning attached to non-lexical expressions; as we shall see, temporal relations, one of the main properties of tenses, are typically procedural, as is the direction of the causal relation for causal connectives. Temporal and causal directions are relevant as soon they are detected; at that moment, the question is whether the relation is forward or backward. In other words, is the relation iconic or non-iconic? I hypothesize that it is precisely the procedural meaning of the expression that gives the answer.

3 Theoretical foundations

The questions formulated above only make sense if some theoretical foundations are clearly stated. The main goal of pragmatic theory is to explain speaker meaning in communication. The assumption of all theories influenced by Grice's seminal *Logic and conversation* (Grice 1989: 22–40) is that speaker meaning is the result of a calculation, giving rise to one type of meaning, conversational implicature, which is defined as non-truth-conditional. In other words, an implicature can be false whereas the assertion that triggers it can be true. This a very robust property; whatever the nature of the implicature (what Grice calls *conversational* and *conventional* implicatures), implicatures share non-truthfulness but differ on cancellability, which is restricted to conversational implicatures. This property is noticeable because it is exactly the reverse which is at stake in terms of presupposition: a presupposition is a proposition entailed both by the assertion and its negation, whereas its cancellation produces a clash in conversation, a development

2 This a main point to be made clear: the result of an instruction (procedural meaning) is not a proposition, but an injunction. For instance, "look for the speaker" for the procedural meaning of the first person pronoun *I*.

which shows disagreement over not only what is or isn't true, but the common ground of the conversation (see chapter 8). These two types of meaning provide an initial clue to what meaning is, and what communication is. In verbal communication, the speaker gives what Relevance Theory calls cues or indices for the addressee to obtain his *informative intention*. Two principal points must be made explicit.

First, for speaker meaning to be accessed, the speaker must make her informative intention accessible by signalling her communicative intention. What makes human communication with natural language specific is that it is not restricted to an encoding and decoding process. This is certainly what brings about the main difference between pragmatics and most paradigms in language science; linguistic approaches to meaning assume that meaning is mainly an affair of *convention*, from Saussure ([1916] 1978) to cognitive linguistics (Langacker 1991), to say nothing of generative syntax (Chomsky 1995). For Saussure, a language (*langue* in his terms) is a convention which must be shared inside a social community: "[language [*langue*]] is both a social product of the faculty of speech and a collection of necessary conventions that have been adopted by a social body to permit individuals to exercise that faculty." (Saussure 1977: 9).[3] In cognitive grammar, Langacker (1991: 263–264) clearly defines a grammar as "a structured inventory of conventional linguistic units." In generative grammar, and more specifically in the Minimalist program (Chomsky 1995), a grammar is a computational device connected to the sensorimotor and the conceptual-intentional interfaces, responsible for the phonetic form and the logical form of a sentence: "[. . .] the cognitive system interacts with the performance systems by means of levels of linguistic representation [. . .] the cognitive system interacts with just two such "external" systems: the articulatory-perceptual system A-P and the conceptual-intentional system C-I. Accordingly, there are two interface levels, Phonetic Form (PF) at the A-P interface and Logical Form (LF) at the C-I interface" (Chomsky 1995: 2). In other words, all linguistic paradigms describe "language as sound with meaning, traceable at least back to Aristotle" (Chomsky 1995: 2).

Second, what verbal communication shows as far as meaning is concerned is that it can only be conventional; Grice (1989) developed a very precise concept of meaning he called *non-natural meaning*, defined (1989: 219) as such: "'meant$_{NN}$ something by x' is roughly equivalent to 'A uttered x with the intention of

3 "[la langue] est à la fois un produit social de la faculté du langage et un ensemble de conventions nécessaires, adoptées par le corps social pour permettre l'exercice de cette faculté chez les individus" (Saussure [1916] 1978: 25).

inducing a belief by means of the recognition of this intention'". In other words, the recognition of the intention to induce a belief (the informative intention) is possible if, and only if, the addressee recognizes this intention. This second order intention is called the communicative intention in Relevance Theory.

So why is the case that communicative intention is required to arrive at the informative intention? If human communication were restricted to a coding process (encoding and decoding), no such requirement would be necessary. But as meaning is non-natural, the recipient must be able to access cues, or indices, to draw the right conclusion – i.e. to identify the right informative intention, the speaker's meaning.

This leads us to ask what non-natural meaning *is*. Meaning$_{NN}$ has two properties (Reboul 2007): it is under the control of the speaker's volition, and is not factive. This contrasts with what Grice calls *natural meaning* (meaning$_{N}$), which is factive and not under the voluntary control of the sender. For instance, smoke naturally means fire, whereas an utterance does not naturally mean what it means but is the result of principles and rules that Grice attributes to conversation – i.e. the cooperative principle and the maxims of conversation (quantity, quality, relation and manner). But there is a further property which makes the difference between meaning$_{N}$ and meaning$_{NN}$ more salient: in meaning$_{N}$, *x means that p* entails *p* (Grice 1989: 213), whereas with meaning$_{NN}$, *x means that p* does not entail *p*. (3) is a classic example of meaning$_{N}$ and (4) an example of meaning$_{NN}$:

(3) *Those spots mean measles*.

(4) *That remark, "Smith couldn't get out without his trouble and strife" meant that Smith found his wife indispensable*.

The reason why there is no entailment in meaning$_{NN}$ is because it is cancellable. Grice (1989: 214) gives as a follow-up sentence to (4) "But in fact Smith deserted her seven years ago". In other words, with meaning$_{NN}$, the relevant test is the cancellation test, made explicit in *Further notes on logic and conversation* (Grice 1989: 44):

> You will remember that a putative conversational implicature that *p* is explicitly cancellable if, to the form of words the utterance of which putatively implicates that *p*, it is admissible to add *but not p*, or *I do not mean to imply that p*, and it is contextually cancellable if one can find situations in which the utterance of the form of words would simply not carry the implicature.

So, what makes non-natural meaning particular is its cancellability. This property is exactly that of *conversational implicatures*, whereas conventional implicatures

are not cancellable: meaning$_{NN}$ corresponds to what is *implicated*, and differs from what is *said*. What is said is truth-conditional, what is implicated is non-truth-conditional, and the combination of what is said and what is implicated corresponds to what is *communicated* (*conveyed* in Grice 1989). Meaning$_{NN}$ thus equates implicatures and speaker meaning (although see Moeschler 2017a for a counterargument). This is a significant outcome for a theory of linguistic communication: human linguistic communication is thus based on inferred meaning, and not on literal meaning. The main goal of a pragmatic theory is then to explain the derivation from literal meaning (what is said) to what is implicated.

In *Logic and conversation*, a general template of this relation is provided.

> It is a common place of philosophical logic that there are, or appear to be, divergences in meaning between, on the one hand, at least some of what I shall call FORMAL devices – ~, ∧, ∨, ⊃, (∀x), (∃x), (ιx) (when these are given a standard two-valued interpretation) – and, on the other, what are taken to be their analogues or counterparts in natural language – such expressions as *not, and, or, if, all, some* (or *at least one*), *the*. (Grice 1989: 22)

The Gricean explanation is an alternative to the classic explanations from philosophy of language: the formalist approach, which claims that natural languages *are* formal languages (in the vein of the Montagovian view of semantics, Thomason 1974, Partee 1976, Gazdar 1979); and the non-formalist approach, which capitalizes on Frege's general intuition that natural languages are imperfect ("an incompleteness of language", Frege 1948: 222; see also Ducrot 1989, chapter 2). The difference between formal and natural languages is thus explained by a complete divergence between meaning in logical languages, which rests on propositions, and meaning in natural language, which is about utterances. So, logic and natural language have different objects, and the non-logical behaviour of meaning is explained by a difference in objects (propositions vs. utterances).

However, the Gricean solution is different; it is based on the idea that sentence meaning is grounded in logic, and utterance meaning corresponds to what is implicated. The object of pragmatics is thus to explain how logical meaning – such as that of negation, quantifiers and logical connectives – can be made more specific by general principles of conversation. Table 1 shows these meaning divergences:

This general template, while raising new issues (see chapter 7), is certainly a positive contribution to the semantics-pragmatics interface; however, it seems to be less favourable for non-logical devices like tenses and non-logical connectives. The apparent non-logical semantics of tenses and non-logical connectives will be developed in chapters 4 and 6 respectively. But what needs to be made explicit is the semantics-pragmatics interface – that is, the way semantic meaning interacts with pragmatic meaning.

Table 1: Semantics and pragmatics of logical words.

	Semantics	Pragmatics	Type of meaning
some	$\exists x$	$\neg\forall x$	scalar (quantitative) implicature
p and q	$p \wedge q$	p < q, p CAUSE q	temporal/causal meaning
p or q	$p \vee q$	$p \bar{\vee} q$	exclusive disjunction
if p, q	$p \rightarrow q$	$p \leftrightarrow q$	biconditionals

4 The semantics-pragmatics interface

In chapter 1, the semantics-pragmatics interface (SPI) will be extensively developed, and a general picture, including types of meanings and different criteria, will provide a complex but illuminating analysis of the way linguistic meaning can be connected to meaning in use. The idea is that linguistic meaning is encoded through the syntax and the lexicon, and is either conceptual and/or procedural. This meaning is compositional in nature, the result of a shallow but efficient, quick and modular process. The exact nature of the relation between semantics and pragmatics will be subject to an ad hoc discussion of different types of expressions and domains. The principal proposal is that the distinction between semantic and pragmatic meaning comes from the fact that contextual information is needed to obtain a complete interpretation. The context is not defined here as a set, each context (c_i) being associated with one specific meaning (m_i), as Figure 1 shows, but in a very restricted way, as containing the minimal required information fitted to a specific interpretation, as in Figure 2.

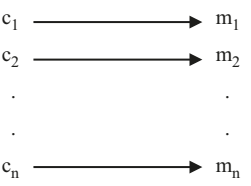

Figure 1: A semantic definition of context (*c*) mapping meaning (*m*).

Chapter 1 will discuss how this enrichment process is to be fulfilled; its answer is based on the way contextual information is accessed with or without information provided by linguistic material. In essence, the contrast between (5) and (6) comes from the absence of the contribution of connectives, and more specifically conceptual and procedural meanings, to the process of constituting context:

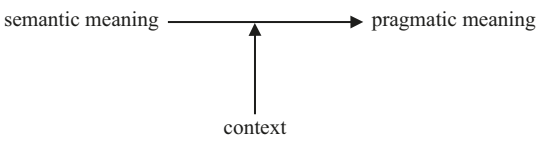

Figure 2: A pragmatic view of context.

(5) *She slipped. The road was icy.*

(6) *She slipped because the road was icy.*

Moeschler (2016a) proposes that the main difference between (5) and (6) comes from the nature of the context necessary to infer the causal relation between the slipping and the ice on the road. In other words, the presence of a connective has as a principal effect the reduction of processing costs, as has been argued in Blochowiak (2014a, 2014b). The result of such a connective is a significant reduction in the number of contextual assumptions. Using different arguments, Moeschler (2018b) shows that the contextual effects, with or without connectives, are not identical: the outcome with a connective is much more precise than without a connective. So, if the same goal can be reached by different routes, the path without a connective is longer and less reliable than the path with one. The main benefit of the connective is the quality of the effect: the cognitive effect triggered by a connective is more accurate and cheaper, and the cost in processing a supplement word is balanced by its effects.

However, for these assumptions to be sound, the content of the conceptual and procedural meaning must be able to predict the right effect in the appropriate context. This challenge can be illustrated by the variation in use with connectives. Take for instance the difference in meaning between the two following uses of *because* (Sweetser 1990):

(7) *He came back because he loves her.*

(8) *He loves her, because he came back.*

The semantic meaning of *because* is the same in both uses: *because* signals a causal relation between an event (*he came back*) and a state (*he loves her*), but the order of the cause and the effect is not the same, being non-iconic in (7)

and iconic in (8). So, why should (8) not give rise to a non-iconic reading, along the lines of (9):

(9) His return caused his love for her.

Sweetser's explanation requires the distinction between the semantic (causal) and the epistemic domains, and (8) is interpreted as (10):

(10) His coming back causes me to believe that he loves her.

In chapter 6, I will propose an alternative analysis, based on the description of connectives like *because* at the conceptual and procedural levels. The challenge requires that both interpretations for *because*, as well as its speech act uses (*Are you ready? Because we are late*), be compatible with the semantic and epistemic uses. But this is not enough, because the same type of content relation – that is, a causal relation – can be obtained with different connectives, as shown in (11) and (12):

(11) *He loves her; so, he came back.*

(12) *He loves her, and he came back.*

In chapter 6, I will give a contrastive analysis of the French connectives *parce que* 'because', *donc* 'so' and *et* 'and', where their meanings align, and where they deviate.

5 Outline of the book

This book is organized as follows. Three parts of the book (parts 2 to 4) are devoted to three topics (time, causality and logical words), each containing two chapters: the first presents the issue of the domain, and the second a semantic and pragmatic analysis of specific pragmatic markers (tenses, causal connectives and negation). Before this, part I will provide the theoretical foundations on which our proposals will be based.

Chapter 1 will be a detailed analysis of meaning relations such as entailment, presupposition, explicature and implicature. Truth-conditional criteria will be proposed, and their interaction with these semantic and pragmatic relations and linguistic markers investigated. What is behind this analysis is the issue of the semantics-pragmatics interface, as discussed in Moeschler (2018c).

Chapter 2 is devoted to the conceptual/procedural distinction; its main goal is to propose a new and compelling approach to pragmatic meaning and its relation to semantics. Furthermore, a clear-cut relation between types of meaning and the nature of the information encoded (procedural vs. conceptual) will be proposed.

Chapter 3 is about temporal references and temporal relations in discourse. I will identify an apparently minor issue of temporal relation, traditionally labelled as the temporal order issue. The proposed model for explaining temporal order affords a central role to the concept of directional inference, based on the idea that time is directional, and that temporal direction is one of the features central to the representation of time in language and discourse (see Moeschler 2000a for a synthesis).

Chapter 4 is an illustration of the semantics and pragmatics of French tenses in the light of the conceptual/procedural distinction. The proposed model combines classic Reichenbachian semantics for tenses (Reichenbach 2005) with a pragmatic model of time, as developed in Grisot, Cartoni, and Moeschler (2016). This approach gives a very general and unconstrained conceptual semantics for tenses and explains how their semantics is constrained by pragmatic features at the level of procedural meaning.

Chapter 5 is about causality and its relation to temporal order. A general model of causality will be developed based on Moeschler (2003), showing how natural languages express temporal order and causal relations (explanation and justifications) in discourse. The main idea is that causal relations in natural languages are expressed in a non-iconic order (i.e. the ante-chronological order; Grisot 2018a), whereas the temporal order follows an iconic order (i.e. a chronological order). One of the main points of this chapter is to explain why causal relations in discourse can express relations of argumentation, and thus why argumentation can be marked with causal connectives such as *because* (Moeschler 2014).

Chapter 6 analyses causal connectives, and tries to explain the difference between causal, inferential and temporal connectives. The comparative analysis of French causal connectives like *parce que* 'because' (as opposed to inferential *donc* 'so' and temporal *et* 'and') will demonstrate a very strange property of causal connectives: they are backward-oriented. It will be shown that there are no forward causal connectives (at least not in French), the reason being that backward orientation is the only possible means of ensuring a causal reading, no matter the discourse segments' aspectual properties. Additionally, a description of these connectives will be put forward, combining their inferential contributions, the types of meaning, and the conceptual/procedural distinction (Moeschler 2016a).

Chapters 7 and 8 are about logical words. First, in chapter 7, the issue of logical connectives will be developed, demonstrating how logical meaning is connected to pragmatic meaning (Moeschler 2017a). The main conclusion of this chapter is that speaker meaning cannot be reduced to implicatures. The study of negation in chapter 8 suggests a precise relation between semantics (entailment and scope) and pragmatics (discourse relations and connectives, contextual effects). The aim of this chapter is to argue for a monoguist approach to negation, as initially proposed by Horn (1985). However, a robust contextualist analysis of negation will be developed, disentangling the descriptive from the metalinguistic, and addressing the status of negation as a conceptual or a procedural marker.

Finally, the conclusion will attempt to determine the extent to which meaning is conventional. I will propose a new and original approach to meaning variation, ascribing responsibility for meaning variation to procedural meaning, whereas conceptual meaning – defined as robust vs. flexible – intervenes mainly when a grammaticalization process takes place, as in a change of category (from lexical to functional).

Part I: **Theoretical foundations**

1 Types of meaning and the semantics-pragmatics interface

1 Introduction

All semantic and pragmatic approaches to meaning share the idea that meanings are diverse, and that some of them are structured. First, one of the basic distinctions is between literal and non-literal meaning, of crucial relevance to the analysis of speech acts (Searle 1969, 1979). In speech act analysis, an utterance like (13) literally means (14), but communicates (15):

(13) *Can you pass the salt?*

(14) Are you able to pass the salt?

(15) I request that you pass the salt.

In speech act theory, there is a clear and explainable relation between literal and non-literal meaning. The main assumption of indirect speech act theory (Searle 1979) is that one way of realizing an indirect speech act is to ask one of the addressee's condition defining the meaning of an act of requesting. This is the preparatory condition 1 (Searle 1969: 66): "*H*[earer] is able to do *A*[action], *S*[peaker] believes that *H* is able to do *A*". So, asking whether the hearer is able to pass the salt is equal to a request for the salt.[1]

Second, in Gricean pragmatics, it is common in most situations to associate what is implicated with what is said. For instance, (16) is a classic example of conversational implicature, where B implicates in her answer to A that C "is the sort of person likely to yield to the temptation provided by his occupation" (Grice 1989: 24), put succinctly in (17):

(16) A: *How is C getting on his job?*
B: *Oh, quite well, I think; he likes his colleagues, and he hasn't been in prison yet.*

(17) C is dishonest.

1 This analysis unfortunately cannot explain why (2) is not a way to ask for the salt, that is, why only the modal *can* succeed in doing so (1).

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Third, when a speaker asserts a sentence, such as *I stopped smoking* in (18), she does not just assert something she believes to be true, but also presupposes a true proposition, which is not communicated but is necessary for the assertion to receive a truth value.

(18) Doctor: *Are you a smoker?*
Patient: *I stopped smoking seven years ago.*

(19) The patient used to smoke.

The assertion *I stopped smoking* cannot be true if it is false that the patient smoked in the past. So, the patient in this situation should have answered *No*, or *I never smoked*; but in the case of (18), her answer presupposes that the doctor thinks, or has reason to think, that the patient used to smoke. Similarly, if the doctor had asked (20) instead of (18), the patient – if she never smoked – is placed in a less-than-optimal situation where she is required to cancel the relevant presupposed proposition that she used to smoke:

(20) Doctor: *When did you stop smoking?*
Patient: *I did not stop smoking, because I have never smoked.*

Last but not least, some implicit content is even more covert than presuppositions, which cannot be false if the assertion is true – that is, which are not defeasible without contradiction. *Buying a Chow* certainly entails "buying a dog", and if a proposition is true of a Chow, it is true of a dog, as (21) shows:

(21) # *I bought a Chow, but not a dog.*

These facts are uncontroversial, but they seem to belong to different categories of issues: the direct vs. indirect speech act is a pragmatic issue; the difference between what is said and what is implicated shows the difference between semantic and pragmatic meanings; the assertion/presupposition distinction is a semantic and pragmatic issue (the target is a presupposition, but the trigger is an utterance); and finally, entailment is a semantic relation between what is said and what is entailed.

So why is the distinction between what is literal and non-literal not of the same type? The usual answer is that an indirect speech act has a pragmatic meaning as well as an implicature, whereas presuppositions and entailments are defined as semantic. So, the literal/non-literal distinction is not homogeneous, whatever the property of the trigger and the target, as Table 2 shows:

Table 2: Different types of meaning.

	target	
trigger	**semantic**	**pragmatic**
semantic	entailment	presupposition
pragmatic	implicature	indirect speech act

This initial analysis is unfortunately incomplete: first, the list of types of meaning is not exhaustive; second, at least one type of meaning (presupposition) is not always considered as semantic, but as pragmatic (Stalnaker 1977); third, nor is there any consensus on the nature of one type of implicature – that is, conventional implicature, defined in Potts (2005) as semantic meaning. The primary goal of this chapter is to fix the definition of these meaning relations. To do so, I will propose a method of disentangling meaning relations from one another. The first step is to propose certain tests; the second provides a truth-conditional analysis, which is to say a contrastive analysis of entailment, presupposition, explicature and implicature based on truth tables.[2] Finally, I will use these findings to explore the issues of the semantics-pragmatics border and interface.

2 Tests for disentangling types of meaning

There are apparently two simple tests for these different types of meaning, *negation* and *explicitness*. The first involves seeing what happens when the trigger is negated; the second relates to whether or not the target can be made explicit. The first test is looking for contradiction, where the second is an evaluation of the pragmatic acceptability of explicitness.

Before applying these two tests to these four meaning relations, I would like to add to the previous list of meanings one uncontroversial type of meaning, which is pragmatic, but not implicit. This type of meaning is what has been described as *explicatures* in Relevance Theory (Sperber and Wilson [1986] 1995; Wilson and Sperber 2004). In chapter 7, a more precise argument from Wilson and Sperber (2012, chapter 8) will be given, based on the pragmatic meaning of the conjunction *and*. For now, I will simply assume that certain enrichments of the proposition expressed need to bind certain variables, or be modulated

2 I will consider indirect speech acts a special type of implicature, exactly in the vein of Horn (1984).

during the pragmatic process by what Carston (2002) calls *saturation* and *modulation*, and what Recanati (2010) calls *primary pragmatic processes*:

(22) *It is raining* [here].

In (22), the unarticulated constituent [here] is needed to build a full propositional form (Recanati 2010). The full proposition must specify the temporal variable [now] associated with the present tense, and another variable, locative, giving rise to the full proposition (23):

(23) *It is raining* [in Cluny] [on Wednesday 14 March 2018]

In (24), the concept BACHELOR must be specified in order to exclude candidates such as the Pope, or the old man living with his mother on the same floor as Mary.

(24) *Mary is happy: she finally met a bachelor*.

2.1 The explicitness test

The first test consists in a follow-up sentence making the target meaning explicit. I will start with entailment and presupposition, as in (25) and (26) respectively:[3]

(25) ?? *I bought a Chow, so I bought a dog*.

(26) ?? *I stopped smoking, so I used to smoke*.

(25) and (26) are odd, mainly because the information made explicit (buying a dog, having smoked) are automatically associated with the proposition and the assertion uttered. This is a well-known fact, mentioned for instance in Ducrot's (1972) sequencing rule (*règle d'enchaînement*) stating that it is not possible to link an assertion with its presupposition. As for entailment, since the superordinate concept to CHOW – DOG – is entailed by the subordinate one, any explicitness in unnecessary, because the former belongs to the meaning of the latter.

3 ?? stands for pragmatic oddity.

This is a general characteristic of any semantic property. Unless explicitness is relevant for some communicative reason, the explicitness of the entailment is useless. So, (27) is odd; (28), while informative, is acceptable, but there is no entailment relation between the trigger and its follow-up.

(27) *My daughter, a female human being, is engaged.*

(28) *My daughter, who is a young and beautiful lady, is engaged.*

When it comes to presupposition, the reason why its explicitness is not possible as a follow-up is different. In the following very common example, the presupposition is triggered by a possessive expression:

(29) *My daughter is in Japan.*
Presupposition: the speaker has a daughter

Of the three follow-ups below, each introduced by a connective, (30) is contradictory, (31) redundant, but (32) is informative:

(30) # *My daughter is in Japan, but I have no daughter.*[4]

(31) ?? *My daughter is in Japan; therefore, I have a daughter.*

(32) *My daughter is in Japan, because I have a daughter.*

(30) is contradictory because the follow-up sentence is a denial of the presupposition, both presupposing that the speaker has a daughter and implying that she has not. Note that (30) can be saved if *daughter* is put in quotation marks, referring perhaps to a daughter-in-law, for example, or to someone else whom the speaker would not call her daughter:

(33) *My "daughter" is in Japan, but I have no daughter.*

In (31), there is a true redundancy. So, if the speaker wants to inform her addressee that she has a daughter, (34) would be a better and simpler way:

(34) *I have a daughter, who is in Japan.*

4 # stands for semantic contradiction.

So, what makes the difference between (34) and (32)? One answer comes from the notion of the *question under discussion* (QUD, Roberts 2004); clearly, (34) answers (35), where (32) instead answers another QUD, (36):

(35) QUD1: *Do you have children?*

(36) QUD2: *Who is in Japan?*

In a *yes/no* question, no presupposition is triggered. The opposite is true in a *wh-* question like (37), as (38) shows:

(37) *Who is in Japan?*

(38) Someone is in Japan.

However, a further answer can be given, referring to what belongs to the *common ground*. In (32), the speaker evidently realized that what she thought to be a common assumption (she has a daughter) is in fact not shared by her addressee, and her follow-up with *because* is a repair: she introduced as new information that which she thought was shared, and already belonged to the common ground. This first test leads us to a semantic diagnostic.

What about true pragmatic meanings, such as explicatures and implicatures? When it comes to explicature, (39) and (40), in the collective reading, show that unarticulated constituents can be made explicit. This is also the case for meaning modulation, which can be made more accurate, as in (41) and (42):

(39) *It is raining here.*

(40) *Abi and Fée climbed the Roche de Solutré together.*

(41) *Mary is happy: she finally met a bachelor, a nice, young and handsome, not-yet-engaged man.*

(42) *This steak is raw: please bring it back properly cooked.*

Why is it possible to make explicit the enrichment of the proposition expressed? One answer is the underspecification of linguistic meaning, as argued by Relevance

Theory. If linguistic meaning is underspecified, in normal circumstances, there should not be an issue determining the basic explicature. However, disambiguation is a fundamental task in utterance understanding, as expressed in the relevance-theoretic comprehension procedure (Wilson and Sperber 2004: 613):

Relevance-theoretic comprehension procedure

a. Follow a path of least effort in computing cognitive effects: test interpretative hypotheses (disambiguations, reference resolutions, implicatures, etc.) in order of accessibility.
b. Stop when your expectations of relevance are satisfied (or abandoned).

So, it is quite reasonable for the speaker to anticipate the addressee's difficulty accessing the right propositional form – that is, avoiding ambiguities. The explicit development of the explicature is one strategy by which the speaker can avoid the possible negative consequences of miscomprehension. How can this be explained? Is it not the case that this strategy goes against a general principle of least effort, like the R-Principle advocated by Horn (1984: 13) according to which the speaker says as little as possible:

The R Principle
Make your contribution necessary (. . .).
Say no more than you must.

The prototypical example given by Horn is indirect speech acts, such as a request. As predicted, an indirect speech act can be made explicit:

(43) Can you pass the salt? It is not a question, but a request.

As such, if explicatures as well as indirect speech acts can be made explicit, this is because the speaker wants to avoid misunderstandings. The same explanation will be used to explain why implicatures can be made explicit.

Are implicatures homogeneous with respect to explicitness? (44) to (46) show conventional implicatures (CIs), generalized conversational implicatures (GCIs) and particularized conversational implicatures (PCIs) respectively. CIs are a type of implicit meaning triggered by a specific expression: they are non-calculable, non-cancellable, non-truth-conditional, detachable (not carried by a synonymous expression), triggered by what is said and determinate (Grice 1989: 39–40; Sadock 1978, for a detailed discussion of Grice's criteria). Conversational implicatures, on the other hand, are calculable (they are the result of a reasoning

process)[5], cancellable, non-truth-conditional, non-detachable (triggered by the meaning vs. the form of the trigger) and indeterminate. A final criterion is that GCIs are triggered by a specific – although cancellable – expression, whereas PCIs are contextual:

(44) *Even Bill likes Mary. He is not the only one, and this is unlikely.*

(45) *Some of the students passed the pragmatics exam. Unfortunately, some didn't pass.*

(46) A: *I am out of petrol.*
B: *There is a garage around the corner. You are lucky: it is open, and they sell gasoline.*

In (44), the CIs triggered by *even* (see Karttunen and Peters 1979 for a detailed analysis of *even*) are made explicit. *Even* conveys non-truth-conditional meanings, propositions that are true if the proposition expressed is true, but that do not play any role in the truth value assignment of the utterance. In (45), *some* and *some not* are compatible, not just because they are subcontraries (see Chapter 7 for a development of this) but because one is the trigger (*some*) and the other the target (*some not*), and vice versa. The compatibility between the assertion and its implicature is not a logical issue, but the consequence of a rule that allows one to make explicit what is covertly communicated by implicature. This principle is at work in this example whatever the type of conversational implicature: with a PCI, the overt realization of the implicature is in some circumstances more than relevant. What could the relevance of B's reply in (45) be if the encounter happened at midnight, when a garage is not open under normal circumstances? By making the implicature explicit, the speaker makes her point clearer, and ensures that her informative intention will be properly understood.

However, this explanation is only partial. The advantage of implicit communication has been vigorously asserted in an evolutionary theory of language and communication evolution (Reboul 2013, 2017a, 2017b). According to Reboul, the main advantage of implicit communication is to allow manipulatory but non-

5 Here is the working out process as described by Grice (1989: 31): "He has said that *p*; there is no reason to suppose that he is not observing the maxims, or at least the Cooperative Principle; he could not be doing this unless he thought that *q*; he knows (and knows that I know that he knows) that I can see that the supposition that he thinks that *q* is required; he has done nothing to stop me thinking that *q*; he intends me to think, or is at least willing to allow me to think, that *q*; and so he has implicated that *q*."

hostile communication. In this vein of reasoning, it can be argued, as below, that conversational implicatures are accompanied by a speaker's weak commitment, which is not the case for conventional meaning such as entailments, semantic presuppositions or conventional implicatures. As conversational implicatures are weak commitments, it makes sense that they can be made explicit in some circumstances to strengthen a weak commitment and allow the speaker to be strongly committed. This view is somehow paradoxical, and humour provides a counterexample to it. A central feature of jokes (Minsky 1985), as observed by a lot of scholars working on humour (among them Raskin 1985, Attardo 2001), is that the humorous point is never made explicit. For some jokes, this is because it would suppress their main effects, consisting in a clash between two interpretations, as in (47); for others, it is simply because the point cannot be made explicit, as in (48), for reasons of complexity.

(47) *Why did they bury Washington on a hill? Because he was dead.*
(Raskin 1985: 248)

(48) *A gentleman entered a pastry-cook's shop and ordered a cake; but he soon brought it back and asked for a glass of liqueur instead. He drank it and began to leave without having paid. The proprietor detained him. "You've not paid for the liqueur." "But I gave you the cake in exchange for it." "You didn't pay for that either." "But I hadn't eaten it".*
(Freud 1905, from Minsky 1985: 175)

(47) is very simple and childish, mainly because it answers the question but betrays the expectation of relevance. The question under discussion seems to be "Why did they bury Washington on a hill?" whereas the answer is simply to "Why did they bury Washington?". But in (48), the point is more complex. The reply to the final assertion by the proprietor is legitimate, as are the replies to the previous ones, so it seems that the client is not at fault. But the reader could have forgotten that the cake should have been paid for, because it has been exchanged for a glass of liqueur which has been drunk but remains unpaid. So, the fallacy is much more difficult to detect. This is exactly the reason why the story is comical.[6]

To summarize this section, the test of explicitness provides good arguments for a substantial difference between semantic meaning (entailment,

6 The explanation given by Minsky (1985) is cognitive: he assumes that humor has as a main function to test the limits of rationality. When the borders of rationality are trespassed, the field becomes less secure, and censors have to be launched to warn the mind that the rational validity is not insured.

presupposition), which cannot be made explicit in follow-up sentences, and pragmatic meaning – such as explicatures and implicatures, either conventional or conversational – which can be.

2.2 Negation

The second test considers the target when the trigger is under negation. As we shall see, this test is not as straightforward as the explicitness one, because negation can be ambiguous between its descriptive and metalinguistic readings (see chapter 8). So, the question is whether negation preserves or cancels the target – that is, the related meaning to the trigger.

Some cases seem easy at first sight. For instance, in the case of presupposition, both the assertion and its negation preserve the presupposition. Negation is defined as a *presupposition hole*, an operator that lets the presupposition of the trigger pass through it. The standard definition is given as follows (Gazdar 1979: 93):

(49) *P* presupposes *Q*, iff *P* entails *Q* and *not-P* entails *Q*.

So, the so-called semantic definition of presupposition is based on the notion of entailment. But what is an entailment? First consider the behaviour of the negated trigger:

(50) *I did not buy a Chow*.

What exactly is meant by (50)? Did I buy a dog or not? In fact, both positive (51) and negative (52) answers are possible:

(51) *I did not buy a Chow, I bought a Labrador*.

(52) *I did not buy a Chow, I bought a Siamese*.

However, the default case seems to be (51), where the entailment of the positive counterpart ("I bought a dog") remains unaffected by negation; with a cancelled target, the situation becomes marked, thanks to the change of conceptual category, as shown in Figure 3.

While the preservation of the target is a preferred reading for entailments, this leaves open the definition of presupposition as a special case of entailment, because presupposition as well as entailment yield a true target when the trigger is false. However, there is a significant difference between entailment and presupposition, which is the behaviour under metalinguistic negation.

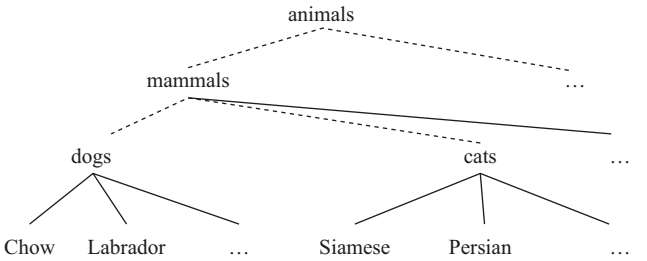

Figure 3: A conceptual structure for entailments (the dotted lines indicate an indirect conceptual hierarchy).

Metalinguistic negation – to be defined more precisely in Chapter 8 – is non-truth-conditional (Horn 1985, 1989) and can be formulated as *I object to U* or *I cannot affirm U* (where *U* stands for utterance), in contrast with the truth-conditional meaning of descriptive negation (*it is not the case that*) (Moeschler 2018a). When the entailment target is false, as in (52), the correct reading of negation when the negated trigger is contrasted happens to be descriptive (53a) rather than metalinguistic (53b).

(53) a. It is not the case that I did not buy a Chow; I bought a Siamese.
b. # I cannot affirm that I bought a Chow; I bought a Siamese.

In contrast, this is not true of presupposition: under descriptive negation, unlike metalinguistic negation, presupposition is preserved. In (54), the scope of negation is the proposition asserted; the presupposition is true, and receives the reading (56). But in (55), with a metalinguistic negation, the reading is (57), and the presupposition is false as a result.

(54) *Abi does not regret having failed her exams; she decided to stop her studies.*
presupposition: Abi failed her exams

(55) *Abi does not regret having failed her exams; she passed.*
entailment: Abi passed her exams

(56) It is not the case the Abi regrets having failed her exams.

(57) I cannot affirm that Abi regrets having failed.

So, it seems that the target is true with both presupposition and entailment under descriptive negation; but when the entailment is false, it is under

descriptive negation, and when the presupposition is false, it is under metalinguistic negation. Table 3 shows this difference:

Table 3: Entailment and presupposition under types of negation.

	target	
trigger	**entailment**	**presupposition**
assertion	true	true
descriptive negation	true or false	true
metalinguistic negation	–	false

In other words, the difference between the two types of negation is a good test for maintaining the difference between entailment and presupposition, and for a pragmatic approach to presupposition.

Under negation, pragmatic explicit meaning is predicted to behave as follows: given that explicatures are developments of the logical form of the sentence, negation is expected to scope over the enriched proposition, and the explicature is therefore under the scope of negation. As a result, negation makes the explicatures false:

(58) *It is not raining* [here].

(59) It is not the case that it is raining at Sainte-Cécile on Friday 16 March 2018.

Note that (58) cannot receive a metalinguistic reading: (60) is thus not a possible reading for (58), mainly because the negation of raining cannot target a stronger predicate, like pouring.

(60) I cannot affirm that it is raining at Sainte-Cécile on Friday 16 March 2018.

However, if there is a significant contrast – for instance, in the choice of the verb denoting rain (*pouring* vs. *raining*) – the reading will not concern the explicature, but the implicature of the negated predicate. (61) is read as (62), with the implicature of the corrective clause given in (63):

(61) *It is not raining* [here], *it is literally pouring*.

(62) I cannot affirm that it is raining at Sainte-Cécile on Friday 16 March 2018, because it is literally pouring.

(63) We had to stay home.

Metalinguistic negation cannot therefore scope over an explicature. However, with implicatures, things are more complex: conversational implicatures are cancellable, but conventional implicatures are not. A good, and classic, example of the latter comes from *even*:

(64) *Even Bill does not like Mary*.

In a negative sentence, the conventional implicatures triggered by *even* are not preserved in its descriptive meaning (65):

(65) It is not the case that even Bill likes Mary.

In (66), the CIs of the assertion are under the scope of negation:

(66) Bill is not the only one who does like Mary and he is the least likely not to like her.

In effect, the positive counterpart (67) conventionally implicates (68):

(67) *Even Bill likes Mary*.

(68) a. Bill is not the only person who likes Mary.
b. Bill is the least likely to like Mary.

(64) certainly does not receive a metalinguistic reading, as (69) is more than improbable, and (70) meaningless:

(69) # *Even Bill does not like Mary: he is for sure the only one to like her*.

(70) # I cannot affirm that even Bill likes Mary, because he is the only one who likes her.

So metalinguistic negation is inaccessible with a negative trigger for CIs. As for conversational implicatures, two readings can be given when the trigger (the positive assertion) is false, as in (71):

(71) *Abi is not beautiful.*

The first accessible reading is descriptive negation, which means that Abi is less than beautiful. But does this mean that the implicature (73) triggered by the positive target (72) is false?

(72) *Abi is beautiful.*

(73) Abi is not more than beautiful.

If Abi is less than beautiful, she is not beautiful; thus it is not the case that she is more than beautiful. So, a situation with a false trigger (Abi is not beautiful) and a true target (Abi is more than beautiful) is simply impossible:

(74) # *Abi is not beautiful; she is not more than beautiful.*

There is a second reading with a negated target: this use of negation is metalinguistic, as in (75), where negation scopes over the implicature of the positive assertion, leaving the assertion untouched, as the entailment (76) shows, and enabling the metalinguistic reading (77):

(75) *Abi is not beautiful, she is gorgeous.*

(76) Abi is gorgeous → Abi is beautiful

(77) I cannot affirm that Abi is beautiful, because she is gorgeous.

Explicatures and implicatures thus provide the following template given in Table 4:

Table 4: Pragmatic meaning under negation.

	target		
trigger	**explicature**	**conventional implicature**	**conversational implicature**
assertion	true	true	true
descriptive negation	false	false	–
metalinguistic negation	–	–	false

The result is very interesting: explicature and conventional implicatures cannot occur with metalinguistic negation and behave alike under descriptive negation. Further constraints must therefore be found, as explicatures and conventional implicatures are uncontroversially considered to be different types of meaning, the first explicit and the second implicit.

A merger of the two templates in Table 5 confirms the initial complexity of meaning.

Table 5: Semantic and pragmatic meanings under negation.

	target				
trigger	**entailment**	**presupposition**	**explicature**	**conventional implicature**	**conversational implicature**
assertion	true	true	true	true	true
descriptive negation	true or false	true	false	false	–
metalinguistic negation	–	false	–	–	false

Essentially, it appears that metalinguistic negation reveals certain qualitative properties for presupposition and conversational implicature, distinguishing them in terms of entailments, explicatures, and conventional implicatures. This confirms the general picture proposed in Potts (2005), making a difference between entailments (including CIs and conventional presuppositions) and context-dependent meanings (conversational implicatures and conversationally-triggered presuppositions), albeit using different evidence:

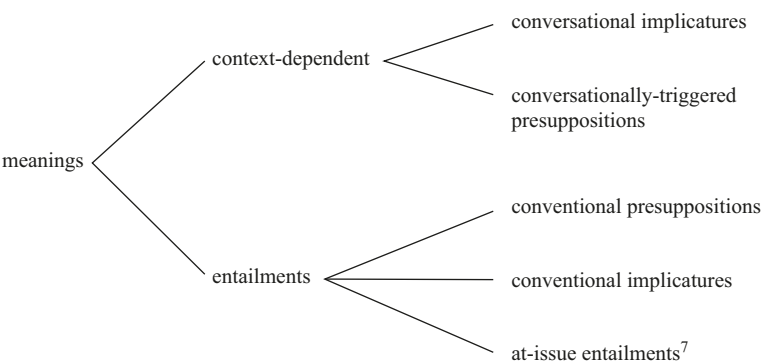

Figure 4: Types of meaning (following Potts 2005: 23).

7 At-issue entailment are logical forms, so richer than what I called entailments. Another interpretation would be that at-issue entailments correspond to explicature. But, unless explicature, AIE are not the result of an inference, but of a compositional semantic process.

3 A truth-conditional analysis of types of meaning

Section 2 gave arguments for a precise and clear-cut distinction between different types of meaning. Section 4, below, asks whether the tests in use are enough to give a general picture of how semantics and pragmatics interact in the process of meaning construction. Certain new criteria will need to be added, mainly because of the behaviour of these types of meaning with respect to explicitness and negation. In the current section, I would like to propose a truth-conditional analysis of these types of meanings, based on the idea that they are all sensitive to the truth or the falsity of both the trigger and the target. Such a proposal has been sketched out in Moeschler (2012) and (2013a), but I would like to add what has been said about conventional implicature as a special kind of pragmatic meaning.

3.1 Entailments

The truth-conditions for *entailments* create the simplest truth table, as it corresponds to the material implication (conditional) truth table. The idea is that it combines the truth conditions of the proposition expressed and the truth condition of the entailment, yielding the truth values of the assertion in Table 6.

Table 6: Truth table for entailment (DN = descriptive negation).

	proposition	entailment	assertion
	1	1	1
	1	0	0
DN	0	1	1
DN	0	0	1

What is impossible, ascribing the value false to the utterance, is the situation where the trigger is true and the target false, as (78):

(78) # *I bought a Chow, but not a dog.*

On the other hand, the <0,1,1> situation corresponds to the default case, where the entailment is preserved (*not a Chow, but a Labrador*) and the <0,0,1> to the change of conceptual category (*not a Chow, but a Siamese*).

3.2 Presupposition

The standard definition of presupposition (*p* entails *q* and *not-p* entails *q*) accounts for lines 1 <1,1,1> and 3 <0,1,1> of Table 7:

Table 7: Truth table for presupposition (DN = descriptive negation).

	proposition	presupposition	assertion
	1	1	1
	1	0	0
DN	0	1	1
DN	0	0	0

In line 2 <1,0,0>, the assertion should not receive a truth value, because the existential presupposition of (79) – "there is a unique king of France" – is false (Strawson 1950). In other words, if presuppositions are defined pragmatically – that is, as conditions of use – (79) could not be uttered and would be nonsense:

(79) *The king of France is bald*.

However, another interpretation is possible, one where the speaker believes that the proposition expressed is true, but something is missing: its presupposition is false. In terms of the global interpretation, Russell (1905) predicts that the utterance is false (<1,0,0>), because it logical form is (80):

(80) $\exists x[king(x) \wedge \neg\exists y\,[king(y) \wedge (y \neq x)] \wedge bald(x)]$
'There is an *x* such that *x* is king of France and *x* is unique and *x* is bald'.

If the presupposition $\exists x[king(x)]$ is false, its falsity automatically makes the utterance false, because its logical form is a conjunction of propositional functions, and the falsity of one of these makes the whole proposition false. This is also the case when the proposition is false, as in (81), with the logical form (82):

(81) *The king of France is not bald*.

(82) $\exists x[king(x) \wedge \neg\exists y\,[king(y) \wedge (y \neq x)] \wedge \neg bald(x)]$
'There is an *x* such that *x* is king of France and *x* is unique and *x* is not bald'.

So, both lines 2 <1,0,0> and 4 <0,0,0> are accounted for. The third line is predicted by the definition of the presupposition: if the proposition is false and the presupposition true, the utterance is true <0,1,1>; a false assertion keeps the assertion-presupposition true if the presupposition is true. This can be predicted by speech act theory, because only one component of the speech act (the propositional content) is faulty, whereas one of its parts – the presupposition – is not. Where the negation is metalinguistic, the proposition is false, the presupposition is false, but the assertion is true (<0,0,1>), as in (83) and its logical form (84):

(83) *The king of France is not bald; there is no king of France.*

(84) $\neg\exists x[king(x) \wedge \neg\exists y\,[king(y) \wedge (y{\neq}x)] \wedge bald(x)]$
'It is not the case that there is an *x* such that *x* is king of France and *x* is unique and *x* is bald'.

In effect, if [king(x)] is false, then $\exists x[king(x) \wedge \neg\exists y\,[king(y) \wedge (y{\neq}x)] \wedge bald(x)]$ is also false, and its negation $\neg\exists x[king(x) \wedge \neg\exists y\,[king(y) \wedge (y{\neq}x)] \wedge bald(x)]$ is true. Just like our truth-conditional analysis, the Russellian analysis predicts that the negative utterance *The king of France is not bald* is true if the presupposition is false. So, the truth table must be amended, as shown in Table 8:

Table 8: Truth table 2 for presupposition (DN = descriptive negation, MN = metalinguistic negation)[8].

	proposition	presupposition	assertion
	1	1	1
	1	0	0
DN	0	1	1
DN	0	0	0
MN	0	0	1

8 This table correspond to the TFC H (Table 43, chapter 7) with DN on the fourth line, that is the truth value of the presupposition (when the presupposition is true, the utterance is true, when it false, the utterance is false), and to C with MN in line four, that is, the TCG corresponding to the conditional.

3.3 Explicatures

When it comes to the truth tables for explicatures, the previous section showed that the explicature is false under negation, yielding a true utterance, as in line 4 <0,0,1> of Table 9:

Table 9: Truth table for explicatures.

	proposition	explicature	assertion
	1	1	1
	1	0	0
DN	0	1	0
DN	0	0	1

But what about lines 2 and 3? The assertion is false if the development of the proposition yields a false proposition. Suppose the addressee thinks that the speaker is in Geneva when she is in fact in Sainte-Cécile. In this case, if it is true that *it rains*, but false that "it rains in Geneva", then the utterance *it rains [here]* is false (<1,0,0>). So, the attribution of a true vs. false truth value to the explicature is not speaker- nor audience-dependent: it is just a relation between what the full proposition described in the explicature and the world. This independence of speaker- and audience-orientation of truth-values is crucial; as in the example above, it can give rise to misunderstandings between what the speaker means and what the audience understands.

Now, if it is false that *it rains [here]*, but it is true that *it rains in Geneva*, then the assertion is false <0,1,0>. The conclusion is straightforward: the explicature must have the same truth value as the proposition expressed in order for the assertion to be true. When such a concordance does not exist, the assertion is false. Table 9 is the table of the logical connective *if and only if*, and biconditionals (Truth Functional Connective *E* in Gazdar 1979: 69, and in Table 43, chapter 7). The consequence is that the utterance is true if and only if the proposition and its explicature are true or false together.

3.4 Implicatures

Starting with *conventional implicature*, the previous section illustrated that under descriptive negation the CI is false <0,0,0>.

(85) *Even Bill does not like Mary*.
CI: Bill is not the only one who does not like Mary, and he is the least likely not to like Mary.

Here, it is false that *Even Bill likes Mary*, and thus the negative utterance (85) is true. But what happens when the CIs are false but the proposition true <1,0>? What conclusions can we draw about (86) if (87) is true and the CIs (88) false? As CIs are non-truth-conditional meaning, the utterance is true, and CIs have no impact on the truth condition of the utterance:

(86) *Even Bill likes Mary*.

(87) Bill likes Mary.

(88) It is not the case that Bill is the only one who likes Mary and the least likely to like her.

When the proposition is false and CIs true <0,1> – as in (89), its proposition (90) and its CIs (91) – the CIs have no influence on the truth-conditions, and thus the utterance is false:

(89) *Even Bill does not like Mary*.

(90) Bill does not like Mary.

(91) Bill is the only one who likes Mary and the least likely to like her.

This gives the following truth table (Table 10):

Table 10: Truth table for conventional implicature.[9]

	proposition	conventional implicature	assertion
	1	1	1
	1	0	1
DN	0	1	0
DN	0	0	0

9 This truth table corresponds to the bivalent connective *I* (Gazdar 1979: 69), which have the same truth-value that the proposition expressed. In other words, the CIs do not affect the truth-conditions.

The final type of meaning to be examined is *conversational implicature*. The previous section concluded that conversational implicatures can be false under metalinguistic negation <0,0,1>. In that case, the proposition is negated, the implicature is false, but the assertion is true, because the proposition is entailed by the corrective follow-up clause, as in (92):

(92) Abi is not beautiful, she is gorgeous.

However, the implicature can be false when the proposition is true, because conversational implicatures are cancellable <1,0,1>.

(93) Abi is beautiful, and even gorgeous.

The final line to be explained (line 3, DN in Table 11) corresponds to the situation where the proposition is false and the implicature true, in which case the assertion is false <0,1,0>. This simply means that a conversational implicature cannot be true if the proposition is false. If Abi is not beautiful, she cannot be gorgeous at the same time, mainly because it is pragmatically possible that, being gorgeous, she is at least beautiful. (94a) is odd because of the explanation connective (*because*) – i.e. the explanation is not relevant – whereas (94b) is fine, as it clearly implies a degree of attractiveness lower than beautiful:

Table 11: Truth table for conventional implicature.

	proposition	conversational implicature	assertion
	1	1	1
	1	0	1
DN	0	1	0
MN	0	0	1

(94) a. # Abi is not beautiful, because she is not gorgeous.
b. Abi is not gorgeous; she is not beautiful either.

This means that the default case for a conversational implicature to be true is when the proposition expressed is true. This clearly shows that conversational implicatures are not logical meanings, since they correspond to ←, the material implication from implicature to proposition.

All meanings can now be summarized in Table 12:

Table 12: Truth conditions for meaning types.[10]

	P	Q	entailment	presupposition	explicature	CI	conversational implicature
	1	1	1	1	1	1	1
	1	0	0	0	0	1	1
DN	0	1	1	1	0	0	0
DN	0	0	0	0	1	0	–
MN	0	0	–	1	–	–	1

4 The semantics-pragmatics border

In the examples above, meanings are seen to be diverse, with different truth conditions and different behaviours in terms of the two tests of explicitness and negation. The question is why is meaning organized in this way, and why the literal vs. non-literal meaning distinction is not simple and sufficient. One of the main ideas of linguistics is that meaning is structured, but there has to date been no general theory explaining the complexity of meanings. Figure 4 examined one recent proposal, but there are no clear criteria for the distinction between entailment and context-dependent meanings. Moreover, why are CIs types of entailments when they are non-truth-conditional meanings, which are traditionally regarded as pragmatic? What is needed is an explanation of the complexity of meanings, especially the relations between semantic and pragmatic meanings.

There are several answers to this question. Most approaches make a straightforward distinction between semantics and pragmatics; for instance, the Gricean model makes a clear-cut distinction between semantics (what is said) and pragmatics (what is implicated), the difference being the truth-conditional aspect of meaning in semantics and the non-truth-conditional aspects in pragmatics. This has been resumed in the famous formula by Gazdar (1979: 2): "PRAGMATICS = MEANING – TRUTH CONDITIONS". In the framework of Relevance Theory, the difference between semantics and pragmatics is not based on truth-conditions, because explicatures – which are pragmatic enrichments of the logical form of the sentence – are truth-conditional meanings. So, the main difference is between what is inferred and what is encoded. But this

10 In this chart, *P* stands for the proposition expressed, *Q* for the target and the last columns the truth of the utterance (the trigger).

criterion is not sufficient, because inference also occurs at the semantic level. Take, for instance, what is defined above as entailment and presupposition: they are inferred meanings. So why are they semantic?

A possible – and now classic – answer is to distinguish analytic and synthetic implication (Sperber and Wilson 1995 [1986]: 104) according to the analytic and synthetic rule distinction: "An analytic rule takes only a single assumption as input; a synthetic rule takes two separate assumptions as input" (Sperber and Wilson [1986] 1995: 104).

Analytic implication
A set of assumptions {*P*} *analytically implies* an assumption *Q* if and only if *Q* is one of the final theses in a deduction in which the initial theses are {*P*}, and in which only analytic rules have applied.

Synthetic implication
A set of assumptions {*P*} *synthetically implies* an assumption *Q* if and only if *Q* is one of the final theses in a deduction in which the initial theses are {*P*}, and *Q* is not an analytical implication of {*P*}.

For instance, the entailment relation in (95) is analytical, whereas the implicature relation in (96) is only possible by way of syntactic implication, as in (97):

(95) x [bachelor(x) → not-married(x)]

(96) A: *Are you going to the pragmatics class*?
B: *I have an appointment with my dentist*.

(97) a. If *x* has an appointment with a dentist at the same time as the pragmatics class, *x* cannot attend the pragmatics class.
b. B has an appointment with her dentist at the same time as the pragmatics class.
c. B is not attending the pragmatics class.

However, types of pragmatic meaning which do not meet the condition imposed for synthetic rules[11] have already been encountered above. For instance,

11 This is principally the reason why Relevance Theory defines implicatures as what corresponds to particularized conversational implicatures in Gricean approach. Generalized conversational implicatures are recycled as explicatures or contextual (PCI). On the other hand, CIs

conventional implicatures, given that they are not calculable, are typically the result of an analytic rule, as in (98):

(98) *Analytic rule for even*
even x P(x) → *x* is not the only entity that is *P*, and *x* is the least likely to be *P*

As far as generalized conversational implicatures are concerned, the same observation can be made for scalar implicatures. If *some* implicates *not all*, based on the quantitative scale <*all, some*>, and the following definition of scales in (100) holds, then scalar implicatures are not the result of a synthetic implication (see Fox 2007; Geurts 2010; Chierchia 2013, for a scalar implicature analysis implying true reasoning):

(99) *Quantitative scale*
In a quantitative scale <α, β>, the strong expression α entails the weak expression β, and β implicates ¬α.

(100) a. *all X* → *some X*
b. *some X* +> *not all X*

In other words, criteria must be proposed in order to disentangle the semantics-pragmatics interface. My assumptions are twofold:
- there is a clear-cut distinction between what is semantic and pragmatic, and the semantics-pragmatics border is therefore not a continuum;
- the types of criteria defining the semantics-pragmatics border do not paint a homogeneous picture, and the border resembles more like the sinuous borders found between certain Swiss cantons than the straight lines dividing the sub-Saharan countries.

I will examine six criteria, some of which were already used as tests: (a) accessibility, (b) strength, (c) explicitness, (d) truth-conditionality, (e) contextualization and (f) inference.

a. *Accessibility*: Accessibility is the property conveying whether content is deep or superficial. Our assumption is that semantic meanings are deep and, as a consequence, not very accessible because they are not necessary for utterance comprehension (they do not need to be derived to access speaker meaning).

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are also absent, recycled as procedural meanings (see Chapter 2, and Zufferey, Moeschler, and Reboul 2019).

We can therefore assume that semantic meanings are paired with linguistic meanings, but cannot be overt, as the explicitness test has shown (semantic meaning cannot be made explicit). On the other hand, pragmatic content must be accessible because its derivation is necessary to understand speaker meaning. If conversational implicatures are cancellable, implicatures can be predicted to be less accessible than explicatures, which means, paradoxically, a close relation between cancellability and accessibility. Second, as CIs are conventional, they are automatically processed and thus, not being inferential, are less accessible than explicatures. So, the following accessibility scale can be proposed:

(101) *Accessibility scale*
explicature > conversational implicature > conventional implicature > presupposition > entailment

b. *Strength*: Strength defines the type of the speaker's commitment (Moeschler 203a). If the distinction between semantic and pragmatic meanings makes sense, semantic contents such as entailments and semantic presupposition are predicted to make a stronger commitment than pragmatic meanings do. As we have seen, it is not possible to cancel an entailment without contradiction. When it comes to presupposition, cancellation is only possible under metalinguistic negation – that is, a pragmatic process. As explicatures are truth-conditional and cancellable under negation, they are stronger than conversational implicatures, which can not only be cancelled, but – more importantly – denied by the speaker. Take the following dialogue, where speaker B denies not knowing where C lives:

(102) A: *Where does C live?*
B: *Somewhere in the south of France.*
A: *So, you don't know where C lives?*
B: *Yes, I do. But I do not want to tell you.*

The strength scale for conventional implicatures is another matter. If CIs are not cancellable but conventional, they resemble entailments, and are distinct from pragmatic presuppositions, exactly what Potts (2005) predicts (see Figure 4). So, the strength scale is the following:

(103) *Strength scale*
entailment > conventional implicature > presupposition > explicature > conversational implicature

c. *Explicitness*: The only type of explicit meaning is explicature. All other meanings are implicit.
d. *Truth-conditionality*: Entailments and explicatures are truth-conditional meanings but are neither presuppositions (they are preserved with descriptive negation), conventional implicatures (which do not contribute to the truth value of the utterance) nor conversational implicatures.
e. *Contextualization*: Entailments and CIs are not contextual, but presuppositions can be, as can explicatures and conversational implicatures.
f. *Inference*: Entailments, CIs and presuppositions are not the result of inference, whereas explicatures and conversational implicatures are.

We can now map these criteria in the following table:

As Table 13 shows, the semantics-pragmatics border is sinuous. This does not mean that there are no clear criteria, nor that the domains are not clearly defined. A useful comparison can be made with two geographical areas. First, the border of sub-Saharan countries, defined with straight lines across the desert, meaning that these countries have been arbitrarily delimited on paper. In contrast, the Swiss Canton of Vaud has a strange border with neighbouring Fribourg: some parts of the canton of Fribourg are exclaves in the territory of Vaud, and one part of Vaud, around the lake of Morat, is an exclave in the canton of Fribourg. The point is that there is no continuity in some parts of this canton. A drive from Yverdon (south of the Lake of Neuchâtel) to Vully will take you from Vaud to Fribourg, then back into Vaud, then Fribourg, and finally Vaud. Just as these exclaves are the result of history, we predict that the complexity of the semantics-pragmatics border also has historical causes.

As is often said in French, *comparaison n'est pas raison* – 'comparison is not reason'. However, as geography is the result of history, and languages are also historical constructs, this comparison shows why the situation of the semantics-pragmatics border is not straightforward. The evolution of meaning in lexical categories is certainly not affected by the same principles as the evolution of functional categories, some – but not all – being the result of a grammaticalization process. Take the example of determiners: regional Swiss French has a demonstrative determiner, *c't*, pronounced [stə], used instead of *ce* [sə] 'this', which comes from Latin *iste*; the French connective *mais* 'but' comes from the Latin adverb *magis* 'more'. But both demonstratives in French and English introduce contrast between entities, and both English *but* and French *mais* denote propositional contrasts. It is probable that the lexical and functional vocabulary, for a definite state of language, has evolved in parallel ways, giving rise to different types of meanings. In other words, the variety of meanings is assumed to result from accidents of history. However, the linguistic and pragmatic competence of current language users do

Table 13: The semantics-pragmatics border.

		ACCESSIBILITY		+
entailment	presupposition	conventional implicature	conversational implicature	explicature
		STRENGTH		–
entailment	conventional implicature	presupposition	explicature	conversational implicature
		EXPLICITNESS		+
entailment	presupposition	conventional implicature	conversational implicature	explicature
		TRUTH-CONDITIONAITY		–
entailment	explicature	presupposition	conventional implicature	conversational implicature
		CONTEXTUALIZATION		+
entailment	conventional implicature	presupposition	explicature	conversational implicature
		INFERENCE		+
entailment	conventional implicature	presupposition	explicature	conversational implicature
	SEMANTICS		**PRAGMATICS**	

not have these differences in mind: no French speaker relates the negative marker *pas* 'not' to the measure 'footstep', as in *il ne marche pas*, originally meaning 'he does not make a single footstep'.

At this point, we have a complex picture of the semantics-pragmatics border and are yet to arrive at an explanation. To do so, we must address the semantics-pragmatics interface.

5 The semantics-pragmatics interface

First, what is an interface? When the notion of interface is used in linguistic theory, it is a locus of information exchange: in the generative approach to linguistics, the

sensori-motor interface and the *conceptual-intentional* interface refer to interfaces where some information (phonetic, semantic) is transferred and interpreted. So, the main function of the Semantics-Pragmatics Interface (SPI) is to allow meaning to be processed. The reason why such an interface is required is because the nature of meaning is not homogeneous: some is conventional, some is contextually computed, some is truth-conditional, some is non-truth-conditional, some is covert, some is overt, and so on. To address the SPI issue properly, I will restrict it to three main questions: (i) How does the SPI work? (ii) Why do we need an SPI? (iii) Where is the SPI located? (Moeschler 2018c)

(i) *How does the SPI work?* The previous section showed that the semantics-pragmatics border is sinuous, with no ordering between semantic and pragmatic processing. Furthermore, neither the integrated pragmatic solution (Anscombre and Ducrot 1983) nor the pragmatic intrusion solution (Levinson 2000) provide an answer, because they do not explain the intricate connection between semantic and pragmatic meaning. It is tempting to say that the border must therefore be *porous*, and that there is a *continuum* between semantics and pragmatics, because this answers one of the issues of SPI: some meanings are strongly semantic (entailment), others are strongly pragmatic (explicature and implicature), and there is a grey zone in between containing presuppositions and conventional implicatures, as in Table 14.

Table 14: Three zones for the SPI.

entailment	presupposition	conventional implicature	explicature	conversational implicature
semantics	S-P grey zone		pragmatics	

However, the proposal put forth here does not accommodate the idea of *a grey zone*. Some meanings are pragmatic when based on certain criteria but seem to be semantic when based on others. Take, for instance, CIs: they are non-truth-conditional, so pragmatic according to this criterion, but conventional, so semantic if conventionality is defined as a criterion for semantics. So, are CIs both semantic and pragmatic? If the border is truth-conditionality, they are pragmatic, but if the border is conventionality, they are semantic. The same reasoning stands for presuppositions: they are non-truth-conditional, as they are cancelled by pragmatic (metalinguistic) negation, but they are mostly conventional in meaning (attached to a specific trigger). So, are presuppositions semantic or pragmatic? The proposal I put forth is that decisive criteria vary as

meaning varies. For instance, non-truth-conditionality is crucial for CI; inferences and contextualization are crucial for explicature and implicature; truth-conditionality, implicitness and non-accessibility are crucial for entailment; implicitness and non-accessibility for presupposition.

(ii) *Why do we need the SPI?* This question is crucial, because the proposal advocated lacks any coherence or economy. The main argument for the SPI is that its function is to allow a quick and efficient transfer of information from a non-linguistic source to the linguistic module, and from a linguistic source to the inferential module. As we have seen, contextual information is required for all pragmatic enrichments; in addition, the triggering of conversational implicatures requires the construction of contextual assumptions. On the other hand, the linguistically encoded meaning is the point of departure of the enrichment process, for instance in reference resolution, inferred conceptual representations (the narrowing and broadening of encoded concepts, Wilson 2003), as well as generalized conversational and conventional implicatures.

(iii) *Where is the SPI located?* My main proposal is that the SPI is a linguistic issue. What is at stake is the relation of information encoded in the lexicon or in the functional categories to their inferred meanings, which interact with non-linguistic information in a significant way.

The complex picture of meaning presented in this chapter is incomplete, because the SPI issue has yet to be addressed in these terms.[12] To do so, we need to know exactly what is encoded and what is inferred. One way to elude the dilemma between a minimal semantics-maximal pragmatics and a maximal semantics-minimal pragmatics is to address the issue of what is encoded and where. My proposal is that a precise division of labour between conceptual encoding and procedural encoding can make this easier to understand.

6 Conclusion

In this chapter, I have tried to address the issues which will help us to understand the complexity of semantic and pragmatic meaning. The main conclusion is that the semantics-pragmatics border is sinuous, even though the semantics-pragmatics distinction is clear; the relevant criterion varies from one type of

12 For classic answers to the SPI issue, see for instance Atlas (1977), Atlas and Levison (1981), Levinson (2000).

meaning to the next. The general explanation of this heterogeneous situation is that meaning complexity is the result of diachronic processes, which happen at different stages for different types of expressions. Chapter 2 will adopt a synchronic perspective, using a general framework according to which conceptual and procedural meanings play a central role.

2 Conceptual and procedural meaning: lexical and non-lexical pragmatics

1 Introduction

In chapter 1, I gave some arguments for a complex but explainable typology of semantic and pragmatic meaning. The border between semantics and pragmatics happens to be more intricate than most theories of meaning have claimed, but this in turn has positive outcomes: complexity of meaning, whether semantic or pragmatic, is a means of accessing speaker meaning. Whatever the reason is for such layers of meaning, an issue remains unresolved: what is the nature of these meanings? In a seminal paper, Wilson and Sperber (1993: 3) make a connection between linguistically encoded meaning and procedural or conceptual meanings. Figure 5 gives the general picture presented in Relevance Theory, in terms of linguistically encoded information; the top of the tree, which relates to information conveyed (not) ostensively and (not) linguistically communicated, has been omitted.

This typology presupposes three levels of meaning (explicature or proposition expressed, higher-level explicature, and implicature). The first level is the basic explicature, which corresponds to the development of the logical form, as in (104), receiving the logical form (105a) and explicature (105b). The second level – the higher-order explicature (105c) – is the embedding of the basic explicature in a higher-order conceptual representation:

(104) *Peter told Mary that he was tired.*

(105) a. *x* told *y* at t_1 that *z* was tired at t_2.
b. Peter Brown told Mary Green at 3 p.m. on June 23, 1992 that Peter Brown was tired at 3 p.m. on June 23 1992.
c. John Green affirms to Sally Brown at 5 p.m. on June 23, 1992 [that Peter Brown told Mary Green at 3 p.m. on June 23 1992 that Peter Brown was tired at 3 p.m. on June 23, 1992].

In terms of the encoded meaning's contribution to implicature (the third level), the classic case of scalar implicature seems to be the relevant one: *or* encodes the "not-and" implicatures, as in a restaurant menu.

(106) a. *Cheese or dessert*
b. The client cannot have cheese and dessert.

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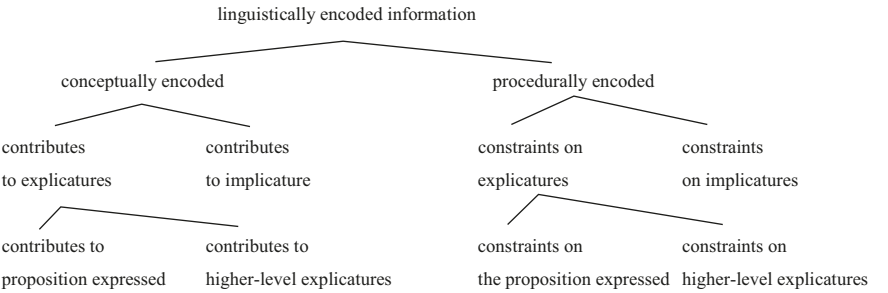

Figure 5: Types of communicated information (Wilson and Sperber 1993: 3).[1]

When it comes to procedural meaning, it is assumed that most discourse connectives are *constraints on implicatures*; for instance, *but* implicates a contrast relation between being honest and dishonest in (107a), because of (107b).

(107) a. *He is a Republican, but he is honest.*
b. Republicans are dishonest.

The best example of *constraints on explicatures* can be given by the procedural meaning of the indexical *I*, which forces the hearer to "look for the speaker" (108); as an example of a constraint of a higher-level explicature, the most obvious case is a routine formula to convey indirect speech acts, as in (109):

(108) a. *I am tired.*
b. Jacques is tired.

(109) a. *Can you pass me the salt?*
b. I request [you pass me the salt]

So, if Sperber and Wilson's typology makes sense, there should be a clear-cut and straightforward distinction between what is conceptually encoded and what is procedurally encoded – that is, between conceptual and procedural meanings. I will first give some arguments for such an approach (sections 2 and 3), and then give other arguments for a more complex picture (section 4). Thirdly, I will propose a mixed conceptual-procedural theory, which not only deals with the

1 In Wilson and Sperber (1993), there is no clear illustration of each of these six options. As we will see, the main issue the relation between conceptual/procedural meaning and (non-)truth-conditional meaning.

functional lexicon, but can also have an impact on the content lexicon (section 5). Finally, I will propose a criterion – negation – to test the nature of the encoded meaning (section 6).

2 Conceptual and procedural meaning, lexical and functional categories

The first usage of the concept of procedural meaning was given in Blakemore's book on connectives. Blakemore (1987) uses Grice's intuition that the contribution of connectives is not truth-conditional, i.e. does not contribute to the truth conditions of the utterances. Grice's comment on example (110) is clear enough (Grice 1989: 362; Wilson and Sperber 1993: 13):

(110) *My brother-in-law lives on a peak in Darien; his great aunt, on the other hand, was a nurse in World War I.*

> [. . .] speakers may be at one and at the same time engaged in performing speech-acts at different but related levels. One part of what the cited speaker in example [110] is doing is making what might be called ground-floor statement about the brother-in-law and the great aunt, but at the same time as he is performing the speech-acts he is also performing a higher-order speech act of commenting in a certain way on the lower-order speech-acts. He is contrasting in some way the performance of some of this higher-order speech-act in his use of the embedded enclitic phrase "on the other hand". The truth or falsity and so the dictive content of his words is determined by the relation of his ground-floor speech-acts to the world; consequently, while a certain kind of misperfomance of the higher-order speech-act may constitute a semantic offense, it will not touch the truth-value and so not the dictive content of the speaker's words.

So, if the connective *on the other hand* does not contribute to truth conditions, what is its contribution? In Grice's theory of implicatures, the meanings of connectives are clear cases of *conventional implicatures* – CIs are non-truth-conditional. So, Sperber and Wilson (1993: 14) give to (111) the analysis (112), making clear the distinction between what is *said* (the truth-conditional content) and what is *implicated* (the non-truth-conditional content):

(111) (a) *It's raining.*
(b) *So the grass is wet.*

(112) *What is said by [111]:*
(a) It's raining.
(b) The grass is wet.

What is conventionally implicated by the use of 'so':
(a) explains (b).

Blakemore's analysis capitalizes on the fact the "conventional implicatures do not contribute to the propositional content of the utterance"; she proposes that "their sole function is to guide the interpretation process by specifying certain properties of context and contextual effects" (Blakemore 1987: 77). Wilson and Sperber (1993: 15) thus translate the Gricean analysis of *so* to its procedural analysis as follows:

(113) *Propositions expressed by [111]*
(a) It's raining.
(b) The grass is wet.
Procedural information encoded by 'so':
Process [113b] as a conclusion.

Several issues have to be addressed. The first, which will be discussed later in reference to causal connectives (Chapter 6), is the *with or without issue* (WWI), that is, the explanation of the difference between discourses with or without connectives. For instance, what is the difference in meaning between (111) and (114)?

(114) (a) *It's raining*.
(b) *The grass is wet*.

The prediction of the relevance-theoretic framework is that (111) is easier to process than (114): so, procedural meaning not only produces contextual effects, as the instruction "process the utterance as a conclusion" shows but is also responsible for easier processing. Chapter 6 will show the formal differences in processing with and without a connective.

However, this initial indication of procedural meaning's function is not enough. The type of meaning which functions as an instruction must be connected to the type of linguistic item which triggers procedural meaning (lexical vs. functional category). If this parallelism makes sense, then all functional materials have an instructional or procedural meaning, as opposed to lexical items having content or conceptual meanings. For instance, this would imply that tenses would be procedural, as well as determiners and pronouns.

On the other hand, the procedural analysis makes a prediction that goes far beyond the classic conceptual analysis when it comes to referential expressions. Take the example of pronouns. What could be the meaning of a third person pronoun, such as *he*? In other words, what would be the difference – in

terms of the means by which reference resolution is obtained – between the four ways of referring to the author of this book in (115a) to (115d)?

(115) a. *Jacques is a linguist*.
b. *He is a linguist*.
c. *This professor is a linguist*.
d. *I am a linguist*.

Proper names (115a) trigger a process of direct reference, at least in some theories of reference (Searle 1969, Kripke 1980, for instance), and the relation between a name and its referent is due to a baptismal act: my name is Jacques because I have been baptized as such. In (115b), however, the pronoun *he* refers to Jacques in a specific context, because the referent is accessible in this context: in itself, the meaning of *he* is restricted to basic grammatical information, such as gender and number. In (115c), the reference is obtained through a demonstrative, which implies an act of ostension (for instance, by pointing to a specific individual, present in the context) and also by the selection of a class of individual – that is, people who are linguists. For instance, if the speaker were at a party at the Department of Linguistics, it would be very useful to make the difference between students and staff members, and professors in particular. So, whereas the reference assignment of *he* can be the result of its procedural meaning, both conceptual and procedural meaning are used for a demonstrative referential expression. Finally, the indexical *I* in (115d) gives a precise instruction. As Wilson and Sperber recall (1993: 20), there is a clear distinction in meaning for sentence (116) between (117a) and (117b) (Kaplan 1989).

(116) *I do not exist*.

(117) a. Jacques does not exist.
b. The speaker of (116) does not exist.

If *I* means "the speaker of this sentence", then (116) should mean (117b), and (117a) and (117b) should have the same truth conditions. But this is not the case, because the proposition expressed by (116) – that is (117a) – could be true in one possible world (that is, an accessible possible word where Jacques does not exist). However, there is no possible world where (117b) could be true, because (116) has been uttered, and (117b) means that the speaker of (116) does not exist. So, (116) is contingently false with interpretation (117a), but necessarily false with interpretation (117b) – that is, false in all possible worlds. These examples show that most referential expressions have a procedural meaning;

as for *I*, its meaning cannot be conceptual, denoting "the speaker of this sentence". In contrast, Wilson and Sperber, using Kaplan's difference between the *content* (the propositional constituent) and the *character* of *I*, propose that the meaning of *I* is procedural, which can be expressed by "look for the speaker".

Tense, as will be shown (see chapter 4), raise a different issue: they refer to time, and therefore have conceptual meanings; but they are also procedural. Their conceptual meanings refer to concepts such as PAST, PRESENT and FUTURE, which are central in order for temporal reference to be established (see Chapter 3). In Chapter 4, we will show that other pragmatic properties of tenses, such as temporal order, are encoded by tenses and are procedural.

Other connectives, such as *because* (see Chapter 6), also have a conceptual meaning, as their causal meaning shows. Even though *because* can have different uses (content, epistemic and speech act, following Sweetser 1990), they all imply a causal relation.

(118) a. *He came back because he loves her.* Content
b. *He loves her, because he came back.* Epistemic
c. *Does he love her? Because he came back.* Speech-act

In the examples in (118), there is a clear causal relation between "coming back" and "loving". So, in all of these cases, (119) is true, but more specific relations explain the content, the epistemic and the speech-act meanings, as made explicit in (119):

(119) His loving caused his coming back.

(120) a. The fact "he loves her" CAUSES the event "he came back".
b. The event "he came back" JUSTIFIES the speaker's belief that "he loves her".
c. The event "he came back" JUSTIFIES the speaker's question "does he love her?".

As argued by Blakemore (1987: 43), *because* has a clear conceptual meaning, as elimination rules are attached to the connective explaining the entailments (121a) and (121b), whereas the conceptual meaning is responsible for the causal interpretation (121c):

(121) *Because-elimination*
Input: P because Q
Output: (a) P
(b) Q
(c) Q is the cause of P

In other words, the causal discourse (122) is analysed as in (123) (Blakemore 1987: 43):

(122) *He left because the band started to play*.

(123) a. He left.
b. The band started to play.
c. His leaving was caused by the fact that the band started playing.

To explain why (121c) could not be described as a procedural meaning, one answer – if incomplete – comes from Blakemore's analysis (Blakemore 1987: 44): "Inference rules are not simply attached to the *concept* represented by connectives: a complete logic would have to include the elimination rule" (emphasis is mine). The principal point is that connectives are associated with concepts, such as the concept of CAUSE. This analysis starkly contrasts with the starting point in this chapter: it has been argued in Sperber and Wilson's analysis of *so* that its procedural meaning was not the explanation relation "*P* explains *Q*", as in the Gricean analysis in terms of conventional implicature, but the instruction "Process *Q* as a conclusion". So why is it not the case that the procedural meaning of *because* is "Process *Q* as the cause of *P*"? While this is a relevant question, it will be argued later that such an analysis confuses conceptual and procedural meaning. Equally, this book (Chapter 6) will suggest that some part of the meaning of *because* will be procedural (the direction of the causal relation), whereas the causal relation itself is conceptual. So, if a connective is the expression of a concept, the concept corresponds to its conceptual meaning. The extent to which all connectives are the externalization of a concept will be discussed later in this chapter. A graded assumption about these types of meanings will instead be proposed.

Nonetheless, an initial conclusion can be drawn: the assumption that "there is a one-to-one relation between the type of meaning and the type of lexical category" is not verified. Conceptual meaning is not restricted to the lexical categories, and procedural meaning is not restricted to the functional categories, as Table 15 shows:

The only cell in this table left unresolved relates to a lexical item's potentially procedural meaning. In section 5, I will identify a type of expression that fits into this cell.

Table 15: Types of meaning, type of categories.

	Type of category	
Type of meaning	**lexical**	**functional**
conceptual	✓ content lexicon	✓connectives, ✓ tenses
procedural	?	✓ indexicals, ✓ connectives, ✓ tenses

3 Conceptual and procedural meaning, truth-conditional and non-truth-conditional meaning

Another issue is whether there is a connection between the types of meaning and truth-conditionality. As explicitly stated in Wilson and Sperber (1993: 12), "Blakemore's analysis of discourse connectives raises an interesting theoretical question: are the truth-conditional and the conceptual, the non-truth-conditional and the procedural necessarily linked?" In terms of the analysis of conceptual and procedural meaning so far, the answer is positive for connectives (they have a non-truth-conditional meaning) but negative for referential expressions and indexicals. If the procedural meaning of *I* is "look for the speaker", it is crucial to assign reference correctly to determine the proposition expressed. The task of assigning reference for the first-person pronoun seems trivial, a priori, but Reboul (1996, 2010) shows this not to be true, giving a nice example of first person pronoun ambiguity in counterfactual sentences:

(124) *If I were you, I wouldn't trust myself.*

(124) can receive four interpretations. Suppose that John is the speaker, and Paul the addressee, then the interpretations are the following:

(125) a. If I_{John} were you_{Paul}, I_{John} wouldn't trust $myself_{John}$
b. If I_{John} were you_{Paul}, I_{John} wouldn't trust $myself_{Paul}$.
c. If I_{John} were you_{Paul}, I_{Paul} wouldn't trust $myself_{Paul}$.
d. If I_{John} were you_{Paul}, I_{Paul} wouldn't trust $myself_{John}$.

In this particular context, where the interpretation of *I* and *you* in the antecedent are based on the actual context of speech (where the speaker is John and the addressee is Paul), four possible interpretations arise in the consequent:

(126) a. John would not trust John.
b. John would not trust Paul.
c. Paul would not trust Paul.
d. Paul would not trust John

As such, the procedural meanings of *I* and *you* are crucial for disambiguating the possible interpretations. Interpretation (126d) is certainly the most relevant; however, there is a complete shift in reference assignment in that case, since *I* becomes the addressee (Paul) and *you* becomes the speaker (John). Even in simple cases such as those involving indexicals, "looking for the speaker" and "looking for the addressee" become complex tasks depending on the choice of the relevant context.

As for conceptual meaning, the obvious candidates come from the open classes of content words, such as nouns, verbs and adjectives, meaning that these lexical categories denote concepts. Take the example of common nouns: it is generally accepted in semantics that the denotation of a common noun (CN) is a set of entities or individuals. For instance, if I am talking about my cat or my dog, reference picks one individual from the set of cats or dogs in order to assign some property to it.

(127) a. *My dog is running after my cat*.
b. Izuki is running after Tanuki.

So, the set of dogs must contain Izuki, and the set of cats Tanuki. If there is a conceptual meaning for *dog* and *cat*, it is because the associated concept has logical, encyclopaedic and lexical properties (Sperber and Wilson [1986] 1995). In other words, the concept CAT has as a lexical entry the word *cat* in English, *chat* in French, *gatto* in Italian, and *Katze* in German: whatever the language, it shares the same logical propriety, which is CAT(x) → ANIMAL(x). The encyclopaedic entry contains information that is specific to individuals, but some information is generic, i.e. information that every speaker knows about cats: they are feline, they have whiskers, their fur is silky, they purr, they are independent, etc.

The most relevant property of concepts is their logical property, because it allows for entailment. It permits the construction of conceptual hierarchies, which are at the basis of entailment relations (Reboul 2007); a lower-bound concept entails its upper-bound, as in (128).

(128) a. CAT (x) → FELINE(x)
b. FELINE (x) → MAMMAL(x)
c. MAMMAL (x) → ANIMAL(x)

This is due to the following conceptual structure:

(129) ANIMAL > MAMMAL > FELINE > CAT

However, there are other types of lexical items, such as manner adverbials, which also have conceptual meaning: for instance, *seriously*, *frankly* and *confidentially*, which are both conceptual and truth-conditional. These play a role in the truth-conditions of the utterances. Wilson and Sperber's (1993: 17) examples, given in (130), all entail the propositions (131), whereas the reverse is not the case.

(130) a. *Mary told Peter seriously that she couldn't help him.*
b. *Mary said frankly to Peter that she couldn't help him.*
c. *Mary informed Peter confidentially that she couldn't help him.*

(131) a. Mary told Peter that she couldn't help him.
b. Mary said to Peter that she couldn't help him.
c. Mary informed Peter that she couldn't help him.

To make this point clear, in the case of conventional implicatures – defined as non-truth-conditional – the sentence without the trigger of the CI is not entailed by the utterance containing the CI trigger, because *even* does not contribute to the truth conditions of the sentence. (132b) can be false; however, under this condition, (132a) is false too, even if it can be true that people other than Bill like Mary.

(132) a. *Even Bill likes Mary.*
b. Bill likes Mary.

As manner adverbials contribute to truth conditions, these adverbs can be used as illocutionary adverbials, as in (133). In such cases, the adverbials scope over the illocutionary force of the utterance, and thus contribute not to the proposition expressed, but to the higher-level explicatures – that is, the illocutionary force of the utterance.

(133) a. *Seriously, I can't help you.*
b. *Frankly, I can't help you.*
b. *Confidentially, I can't help you.*

The interpretation of (133) is something like (134), where the adverbial is external to the proposition expressed, but modifies the illocutionary force:

(134) a. Seriously, I inform you that I can't help you.
b. Frankly, I say you that I can't help you.
c. Confidentially, I tell you that I can't help you.

In other words, the proposition *I can't help you* is the propositional content of the acts of assertion expressed in (30). The contribution of these adverbials is thus to modify the marker of illocutionary force, and not the marker of propositional content (Searle 1969).

To summarize, we have now a full picture of the relationships between different types of meaning and truth-conditionality: some conceptual meanings are truth-conditional, while others are non-truth-conditional; equally, some procedural meanings are truth-conditional, while others are not. Table 16 gives a summary of these combinations:

Table 16: Types of meanings and truth-conditionality.

	conceptual meaning	**procedural meaning**
truth-conditional	content words manner adverbials	indexicals
non-truth-conditional	illocutionary adverbials	connectives

4 Properties of procedural meaning

As seen above, the conceptual/procedural distinction is not motivated morphologically, lexically, or semantically. To arrive at an operational distinction of different types of meaning, it is necessary to have a first precise definition of what procedural meaning is, and second an alternative theory of what conceptual and procedural meanings are – that is, a theory going beyond the truth vs. non-truth-conditional meaning, with a straightforward distribution of conceptual and procedural meanings, as described in Table 16.

First, I would like to provide a rationale for what procedural meaning is. By default, conceptual meaning is unproblematic, even though it can be non-truth-conditional. What is important with conceptual meaning is that it is triggered by concepts – that is, a conceptual representation triggered by a lexical or functional item. This is not a trivial definition, because the intuition behind the classic

analysis of procedural meaning would favour the direct attachment of procedural meaning to a lexical entry. Take, for instance, the connective *but*, which will be discussed in detail in chapter 8 in parallel with negation. In (135a), conceptual representations are accessed directly from the concepts BEAUTIFUL and GORGEOUS. The exact nature of negation's meaning will be investigated later on; for now, suppose that negation is associated with the logical truth-functional operator ¬. (135b) gives the minimal semantic representation, where concepts are in small capitals and procedural expression in italics:

(135) a. *Abi is not beautiful, but gorgeous.*
b. ¬ [BEAUTIFUL(Abi)] *but* [GORGEOUS(Abi)]

Just as described in Reboul (2017a), (135a) is the externalization of a conceptual representation, whereas the connective *but* is the entry for a procedure. This procedure can be minimally described in (136):

(136) a. Draw an implicature from *Abi is not beautiful.*
b. Draw the opposite implicature from *Abi is gorgeous.*
d. Cancel implicature (a) and add implicature (b) to the common ground.

So procedural meaning is directly attached to lexical entries. In the case of *but*, the procedural meaning could be something like (137):

(137) *Procedural meaning of but*
a. Draw an implicature from the first discourse segment preceding *but*.
b. Draw the opposite (contradictory) implicature that follows *but*.
c. Cancel (a) and add (b) to the common ground.

This analysis is much more precise than the classic analysis using the concept of conventional implicature, which would simply introduce the concept of CONTRAST between the first and second propositions expressed:

(138) *But-conventional implicature: P but Q*
a. draw an implicature from *P*
b. draw the opposition implicature from *Q*
c. CI: *Q* contrasts with *P* because of their opposite implicatures

Still required are the properties necessary to identify and locate procedural meaning. In recent works on procedural meaning, Wilson (2011, 2016) has

given properties to the difference between conceptual and procedural meaning. For instance (Wilson 2016: 11),

a. Conceptual expressions in a public language (e.g. *scarlet*, *hop*) are systematically linked to concepts (e.g. SCARLET, HOP), which are constituents of a language of thought.
b. Sentences in the language of thought (e.g. GIRAFFES HOP) are systematically linked to possible states of the world.
c. Procedural expressions in natural language (e.g. *but*, *so*) are systematically linked to states of language users.

There is therefore a relation between conceptual expressions, concepts and the language of thought. Sentences in the language of thought denote possible states of the world, and procedural expressions states of language users, giving a direct relation between conceptual expressions and the language of thought. In terms of the distinction between conceptual and procedural expressions, Moeschler (2016a: 128) proposes several criteria (from Wilson 2011):

Criteria for procedural meaning (PM)
a. PM is not directly accessible to consciousness;
b. PM is not paraphraseable;
c. PM is not easily translatable;
d. PM is associated with specific lexical items.

Criterion (a) makes a vital distinction between conceptual and procedural meaning: the meaning of a conceptual expression is easily accessible to consciousness, which is what makes conceptual meaning so powerful. If the language of thought is made of concepts, they must be associated with conceptual representations, which can be activated in an efficient and frugal manner: thinking about a Chow makes the entailment "a dog" accessible to consciousness. Here, a certain point must be expounded, as otherwise the claim at the end of Chapter 1 could give rise to a contradiction. While examining the semantics-pragmatics border, the assumption was that entailments, as a type of semantic meaning, were less accessible than presupposition and pragmatic meanings. This does not mean that they are not accessible: the argument is that such access is neither required nor useful in the interpretation process. So, entailments are not directly accessible in the interpretation process, although they can be accessed within a reflexive and ulterior process. On the other hand, conventional meaning was predicted to be less accessible than conversational implicature or explicatures. If we equate CIs with procedural meaning, this type

of meaning is not easily accessed. When accessed, the recovery process is not the same as with entailment: it demands metalinguistic reflection; the use of information stored in the memory is only implied in the case of entailment.

Criterion (b) – PM is not easily paraphraseable – is linked to criterion (a): if you ask your addressee to explain what a house is, he will have no issue in describing a house; on the other hand, if you ask him to paraphrase *but*, he will find it very difficult. The easiest way would be to use a proximate connective such as *and*, a connective which is neutral in its procedural meaning. Contrasting (139a) and (139b), where *but* is substituted by *and*, the information about being a Republican and being honest are the same, but the implicatures are not. With *and*, there is no implicature of contrast, and the CI "Republicans are dishonest" is not at issue:

(139) a. *He is a Republican, but he is honest.*
b. *He is a Republican and he is honest.*

From another perspective, developmental studies on the acquisition of connectives (Sanders, Spooren, and Noordman 1992; Evers-Vermeul and Sanders 2009, 2011) have shown that *and* is the first connective acquired, based on the assumption of cognitive primitives. Here is a summary of their approach in Zufferey (2015: 148):

> The first primitive, called basic operation, distinguishes between additive (simple) and causal (complex) relations. The second primitive is polarity, and distinguishes between positive (simple) and negative (complex) relations. The third primitive, temporality, distinguishes between temporally non-ordered (simple) and temporally ordered (complex) relations. [...] Sanders et al.'s model predicts that some combinations are cognitively more complex than others but also that some are of a similar level of complexity. For instance, while non-temporal/additive/positive relations (corresponding to the connective 'and') are the easiest combination, no order emerges between temporal/positive/additive relations and non-temporal/negative/additive ones, because both contain two cognitively simple value and one complex value.

Criterion (c) – PM is not easily translatable – is also a consequence of (b). One of the difficulties in translating connectives is the absence of a one-to-one relation between a connective in one language and in another (see for instance Zufferey and Cartoni 2012; Cartoni, Zufferey, and Meyer 2013; Zufferey and Cartoni 2014; Zufferey, Mak, and Sanders 2015; Zufferey 2016).[2] Corpus studies

2 The same is true with the translation of tenses (see Grisot and Moeschler 2014; Grisot, Cartoni, and Moeschler 2016; Grisot 2018a). For instance, the translation in parallel corpora of

have shown that interpreters, in the flow of interpretation, generally choose the less specified connective, such as *and*, and skip all effects due to their procedural meaning (see Jacob-Geers 1997). In a parallel domain, the acquisition of connectives in L2, a study by Zufferey and Gygax (2017) demonstrates experimentally that "advanced learners do not perceive the difference between relations that need and need not be marked by a discourse connective" and that "these difficulties [. . .] reflect general limitations in proficiency". So, the complexity of procedural meaning makes the learning process of connectives much more complex than that of conceptual meaning.

Criterion (d) – PM is associated with specific lexical items – is the consequence of the absence of a specific concept (for instance, a connective is not the lexical entry of a concept). If this is the case, there is a one-to-one relation between a specific procedural meaning and a specific lexical item. At this point, this relation between lexical item and procedural meaning can be challenged. We know for instance that there are certain features contributing to the multiple usages of connectives. Zufferey and Cartoni (2012) show that the comparison between three causal connectives in English (*because, since* and *as*) and their French counterparts (*parce que, puisque* and *car*) demonstrates a different distribution of two sets of features –the objective vs. subjective and new vs. given features, as Table 17 shows (from Zufferey and Cartoni 2012):

Table 17: Properties of causal connectives (Zufferey and Cartoni 2012; Degand and Fagard 2012).

Connective	objective	subjective	new	given
because	+	+	+	
since		+		+
as	?	?		+
parce que	+	+ (speech)	+	
car		+	+	
puisque		+		+

The chart above shows a correspondence between *because* and *parce que*, and *since* and *puisque*. But a robust corpus analysis does not confirm this initial analysis, as Table 18 shows:

the English Simple Past to French have, as possible targets, the French Passé Simple, the Imparfait, the Passé compose as well as the Present.

Table 18: Principal translation equivalents by type of use.

	objective/new	**subjective/new**	**subjective/given**
because	*parce que*	*car*	
since		*car*	*puisque, étant donné que*
as	*étant donné que, dans la mesure où*	*car*	*puisque, étant donné que*
parce que	*because*	*because*	
car		*because*	*since*
puisque		*since*	*since, as*

This distribution is very interesting, because there is a big difference between *because* and *parce que: parce que* is the only translation of *because* in the objective/new context, while *because* translates *parce que* in objective/new and subjective/new, and *car* in subjective/new. So, procedural meaning is not atomic, and can be split up into different meaning components.

This type of reasoning has been also applied to tenses. Moeschler, Grisot, and Cartoni (2012) and Grisot, Cartoni, and Moeschler (2016) proposed that different French tenses having the same semantics can be described with different pragmatic features. For instance, the semantics and pragmatics of French Passé Simple and Imparfait can be summarized as in (140) and (141):

(140) *Passé Simple*
Semantics: E=R < S
Pragmatics: +narrative,
+subjective
+narrative, –subjective
–narrative, –subjective

(141) *Imparfait*
Semantics: E=R < S
Pragmatics: +narrative,
+subjective
–narrative, +subjective
–narrative, –subjective

If the conceptual semantic meaning is the same – that is, the point of event (E) is located at the same point in time as the point of reference (R), both preceding the speech point (S) (Reichenbach 1947, 2005) – their pragmatics is different, mainly because most of the uses of the French Imparfait are non-narrative and subjective

while most of the Passé Simple uses are narrative and non-subjective. In the course of this chapter, as well as in Chapters 3 and 4, I will defend the proposal that features such as [narrative] and [subjective] are part of the procedural meaning of tenses (Moeschler 2016a).

In short, this section has shown two things: first, procedural meaning is not accessible to consciousness, not easily paraphraseable and translatable, and specific to lexical items; second, the procedural meaning attached to a specific linguistic marker is not atomic but composed of pragmatic features which combine to yield pragmatic meanings.

5 A mixed model of conceptual and procedural meanings

What will be proposed in this chapter is a mixed model for the conceptual-procedural meaning issue. The main findings are that there is (a) no correlation between the type of lexical category and the type of meaning, and (b) no correlation between type of meaning and truth-conditionality. So, what our model predicts is that the four following combinations are possible, as shown in Table 19:

Table 19: Combination of types of meaning.

		lexical	**functional**
procedural	truth-conditional	×	✓ pronouns ✓ indexicals
	non-truth-conditional	?	✓ connectives ✓ tenses
conceptual	truth-conditional	✓ content lexicon	✓ connectives ✓ tenses
	non-truth-conditional	✓ illocutionary adverbials	×

As shown, *procedural* meaning can be truth-conditional and non-truth-conditional for functional categories. The non-truth-conditional procedural meaning for lexical categories is an open issue, marked '?'; section 6 will confirm the possibility of such a combination. However, the lexical procedural truth-conditional combination is impossible (×), as is the functional conceptual non-truth-conditional combination. When it comes to *conceptual* meaning, both lexical and functional categories have been shown to be truth-conditional,

but only functional lexicon can be conceptual and non-truth-conditional. As such, we predict that there is no possible functional category with conceptual and non-truth-conditional meaning, with the lexical conceptual non-truth-conditional meaning corresponding to illocutionary adverbials. So, we have 5 certainly possible combinations, one maybe possible and two impossible.

What would a mixed model look like if it combined lexical vs. functional categories, procedural vs. non-procedural meaning and truth-conditional vs. non-truth-conditional meaning? The only way to make these combinations possible is to represent the conceptual vs. procedural opposition as a gradient, rather than polar, associating each lexical item with two gradient properties: a conceptual value from 0 to 1, and a procedural value from 0 to 1. In order to make the combination simpler, I will propose 3 gradient values: 1, .5 and 0. A third criterion will be used because some lexical or functional items have effects on truth conditions. So, to be able to attribute a truth-conditional value, the scope of the meaning must be a proposition; propositional vs. non-propositional is a polar opposition. This gives 18 possible combinations of values ($3^2 \times 2$), represented in Table 20:

These combinations are illustrated more clearly in Figure 6:

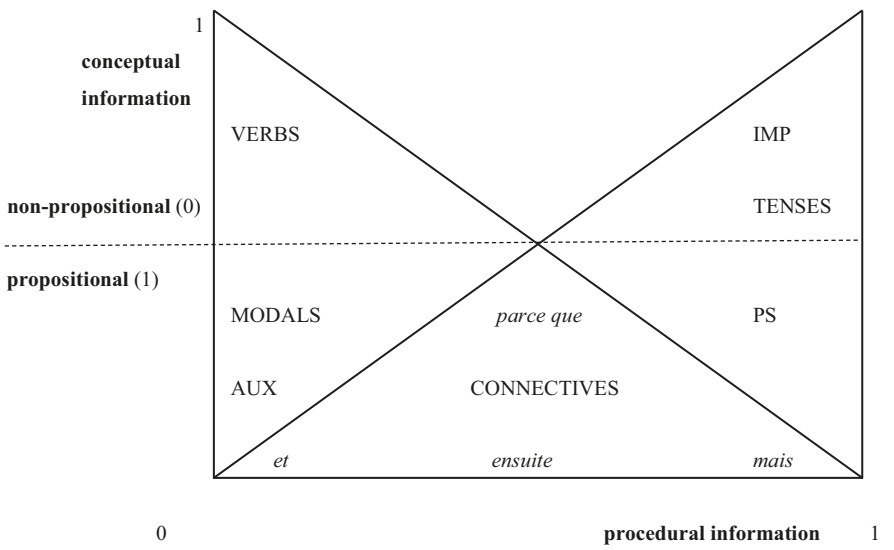

Figure 6: Conceptual, procedural and propositional meanings (from Moeschler 2016a: 128).

Table 20: Possible values for lexical/functional items.

meaning	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
conceptual	1	1	1	1	1	1	.5	.5	.5	.5	.5	.5	0	0	0	0	0	0
procedural	1	1	.5	.5	0	0	1	1	.5	.5	0	0	1	1	.5	.5	0	0
propositional	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0

Figure 6 shows that some of the columns in Table 20 can be attributed a value:

- *et* 'and' corresponds to the values <0,0,1> – that is, *Q*;
- *parce que* has as value <.5, .5,1> – that is, *I*;
- *mais* is interpreted as <0,1,1> – that is, *M*;
- *ensuite* is <0,.5,1> – that is, *O*;[3]
- French Imparfait (IMP) has the value <1,1,0> – that is, *B*;
- French Passé Simple (PS) has the value <.5,1,1> – that is, *G*;
- where eventive verbs are <1,0,0> (*F*), modals and auxiliaries receive the value <1,.5,1> (*C*).

Each item receives a value; some of these values, like <1,.5,0> have no associated lexical items, or might correspond to other types of lexical categories (for instance, common nouns). That said, some generic categories which are not homogenous from a morphosyntactic perspective, such as connectives, correspond to a certain domain going from 0 to .5 for CM, and from 0 to 1 for PM, with the value 1 for propositional value. So, the values *C, G, I, M, O, Q* are candidates for connectives. As for tenses, the second principal class of functional categories this book investigates, the possible values are *F, H* and J (for the Present tense).

This model is theoretical, but as we will see, it makes predictions. One of the most confident, to be developed in Chapter 6, is that the lower the conceptual value of an expression, the more usages or pragmatic values the expression has. By contrast, the higher the procedural value of an expression, the more specific its pragmatic usages. This means, for instance, that a specific high-value tense such as the French Imparfait should have robust semantics – because of its undefeasable conceptual meaning PAST – and a limited number of usages due to its procedural meaning. Interestingly, this prediction is counterintuitive when one considers the classic description of the French Imparfait, which is described as having a large number of usages. This analysis will be proven shallow, as the

3 This seems to be confirmed by the experimental study on *ensuite* by Grisot and Blochowiak (2019), showing that *ensuite* does not play a substantive role in temporal order inferences – 0 CM, .5 PM, so a weak semantic and pragmatic contribution.

number of possible pragmatic features is in fact limited, and mainly restricted to subjective features. So, one of the advantages of this model is not only that it can make predictions, but that it can test these predictions. This is exactly what was done in Grisot (2015, 2018a), where experiments on co-annotator agreement were conducted for the conceptual and procedural meaning of the French Imparfait and Passé Simple, resulting in a threshold with Kappa values for procedural meaning, conceptual meaning, and global and non-specialised pragmatic inferences.

6 A test for conceptual-procedural meaning

The new picture of conceptual-procedural meaning has shown the intertwined relationship between the conceptual and the procedural ones. As we have argued for four criteria defining procedural meaning, conceptual meaning can be defined in opposition to these:

Criteria for conceptual meaning (CM)
a. CM is directly accessible to consciousness;
b. CM is paraphraseable;
c. CM is easily translatable;
d. CM is not associated with specific lexical items.

Criterion (a), as discussed, allows for direct representations associated with conceptual meanings. As discussed, entailments are the result of analytical implications; they are logically true when the assertion is true, which does not mean that the at-issue entailment IS accessible to consciousness. The concept, whose lexical item is its lexical entry, must be directly accessible: this is exactly what is expected for lexical categories (nouns, verbs and adjectives). The only situation where the concept is not accessible is when there is no concept attached to the lexical item. This happens in the acquisition of the lexicon by children, as well as L2 learners. In other situations, the first occurrence of a new word implies the construction of a new concept. As an example, in Paul Auster's novel *4 3 2 1*, the word *Nobodaddy*[4] appears, defined by https://www.etymonline.com/search?q=nobodaddy (accessed 12 October 2018) as "William Blake's derisive name for the anthropomorphic God of Christianity", a word

4 "[. . .] the Nobodaddies in the White House and the Low Library kept speaking their dark words and issuing their obscure laws". (Paul Auster, *4 3 2 1*, chapter 6.1. New York: Henry Holt and Company)

previously totally unknown to me. One of the consequences of the absence of the concept NOBODADDY in my mental lexicon was a partial, patchy reading. The only possible reading of the clause was therefore a truncated one, such as "the White House and the Law Library kept speaking their dark words and issuing their obscure laws". This did no harm, because *Nobodaddies* was just a specification of the speaking agents (the White House and the Law Library). The relevant point is that, having constructed this concept, I could have a much more precise representation of the intended meaning: there are people in the White House and at the Law Library acting as Nobodaddies.

According to criterion (b), a concept can be paraphrased: in the example of *Nobodaddies*, one possible paraphrase is "important people acting as if they were gods". Conceptual meaning is also translatable (criterion c): while in the French version of Auster's novel, this does not happen,[5] an equivalent such as *les prétendus Dieux de la Maison Blanche et de la Law Library* "the alleged gods in the White House and the law library" might have been included. Finally (criterion d), concepts are not attached to a specific wording: different expressions in different languages can be expressed as the lexical entries of the same concept. For instance, *siblings, Geschwistern* and *frères et sœurs* are different lexical entries in different languages for the same concept.

There are now criteria for both procedural and conceptual meanings. The empirical question is whether there is a test to identify which part of meaning is conceptual, and which part is procedural. In this section, I propose that negation can disentangle the conceptual parts of meaning from the procedural. To use the negation test clearly, I will make a number of assumptions. First, descriptive negation, which is truth-conditional (see Chapter 8), should target conceptual meaning, something which is easy to explain. Suppose, for instance, your belief is that my daughter is married when in reality she is not. By asserting (142), I propose a description of the world in which Abi does not belong to the denotation of the predicate *married*, which means that the concept MARRIED cannot apply to Abi. Abi is thus described as having the property of NOT-BEING-MARRIED, expressed in (143):

(142) *Abi is not married.*

(143) [*Abi*]$\in \lambda$x[not-MARRIED(x)]

5 "[. . .] les Nobodaddies de la Maison Blanche et de la Low Library continuaient à tenir leurs discours sinistres et à promulguer des lois obscures". (Paul Auster, *4 3 2 1*, 762, Arles: Actes Sud)

Second, the test is as follows: if *descriptive* negation can scope over one property of a lexical item which is supposed to be procedural, it means that what is scoped over is conceptual. Two examples of this can be given: one on connectives, the other on tenses.

In (144), in semantic terms, negation does not scope over the proposition "the grass is green", which is still asserted by B, but scopes over the causal relation, by denying the explanation given by A and imposing another causal relation (145).

(144) A: *The grass is green because it rained during the whole summer*.
B: *No, the grass is not green because it rained all the summer, but because I watered it every day*.

(145) It is not the case that [the rain caused the grass to be green] and it is the case that [the speaker watered the grass caused the grass to be green]

There is therefore something conceptual in the meaning of *because*; Chapter 6 will propose that the CAUSE component of *because* is conceptual. But what happens with other uses of *because*, like its epistemic use? In (146), negation does not scope over the connectives, but only over the assertion, as (147) shows:

(146) A: *It rained during the whole summer, because the grass is green*.
B: *No, it did not rain the whole summer, because it was the hottest summer for decades*.

(147) It is not the case that it rained the whole summer, and the reason of my belief is that it is the case that it was the hottest summer for decades.

So, only content-*because* can have descriptive negation scoping over the causal relation. As far as tenses go, one prediction that can be made is that it should be possible to negate their conceptual parts. This is exactly what is observed in (148):

(148) A: *I was told that Abi came last weekend*.
B: *No, she did not come last week-end, she will come next weekend*.

(148B) is classic descriptive negation, because the temporal reference of the coming event is disputable, as in (149):

(149) It is not the case that [Abi comes last weekend] and it is the case that [Abi comes next weekend]

The given interpretation of an event as PAST, PRESENT or FUTURE is typically conceptual, and therefore truth-conditional. Of course, all lexical items having a conceptual meaning can be tested to see if they behave in a similar manner, which is exactly what is observed:

(150) a. *He does not drive slowly, he drives rapidly*.
b. It is not the case that [he drives slowly], and it is the case that [he drives rapidly].

(151) a. *I am not talking* {*seriously*, *frankly*, *confidentially*}.
b. It is not the case that [I am talking {seriously, frankly, confidentially}].

Second, if there is a procedural meaning encoded in a lexical unit, this part of the meaning is predicted to be difficult to deny with descriptive negation. What is instead predicted is that negation will be used metalinguistically. Classic examples of metalinguistic negation are upward negation and presuppositional negation (Moeschler 2018a, Chapter 8 of this book):

(152) a. *Abi is not beautiful, she is gorgeous*.
b. *Abi does not regret having failed, she passed*.

The classical analysis of metalinguistic negation is non-truth-conditional (Horn 1985, 1989); not-*P* does not mean "it is not the case that *P*", but "I cannot affirm *P*" (153).

(153) a. I cannot affirm that [Abi is beautiful], because [Abi is gorgeous]
b. I cannot affirm that [Abi regrets having failed], because [Abi passed]

There should be something metalinguistic when negating the procedural meaning. The causal direction can be tested, as in (154):

(154) *He did not come back because he loves her; he loves her, because he came back*.

The expected reading is not a denial of the cause of his coming back, but the reason for his love. So (154) is a classic example of metalinguistic negation, as the gloss (155) shows:

(155) I cannot affirm that [he came back because he loves her]; I affirm that [he loves her] and the reason of my belief is that [he came back]

In other words, when metalinguistic negation is used, I propose that its procedural meaning is at stake.

I gave *indexicals* as an example of procedural meaning in addition to connectives. Indexicals do not seem eligible to fall under the scope of metalinguistic negation, because when they appear in a negative sentence – even with metalinguistic negation – the contrast is never on the instruction, but on its target. For instance, *he/him* and *you* can be used contrastively with different referents, but not *I/me*:

(156) a. *He$_i$ did not eat all the cookies, HE$_j$ ate all of them.*
b. *You$_i$ did not eat all the cookies, YOU$_j$ ate all of them.*
c. *# I$_i$ did not eat all the cookies, Í$_j$ ate all of them.*

On the other hand, when classic metalinguistic negation targets a scalar implicature, the contrast between the negative clause and the corrective (or follow-up) clause – termed NEG and COR respectively in Chapter 8 – is not about the interpretation of the referent, but about the quantifying expressions:

(157) *You did not eat some cookies, you ate ALL of them.*

Even in a situation where the presupposition is denied, there is no possible metalinguistic reading of the indexicals, as in (158):

(158) A: *Why did you eat all the cookies?*
B: *It's not me.*

Briefly put, it does not seem possible to negate the procedural part of the meaning of an indexical like *I/me*, mainly because a first singular person pronoun cannot refer to more than one individual.

In Table 15, summarizing the possible lexical and functional expressions with procedural and conceptual meanings, it was shown that there were three possible candidates:

- Lexical conceptual: content lexicon
- Functional conceptual: connectives, tenses
- Functional procedural: indexicals, connectives, tenses

Although there seem to be no lexical procedural expressions, I believe that the metalinguistic negation test in fact uncovers some. Metalinguistic negation can refuse the USE of a word:[6]

(159) A: *Il me fait délirer.*
He me makes rave
'This guy makes me delirious'.
B: *Non, il te fait rire, pas délirer.*
no he you make laugh not rave
'No, he makes you laugh, not be delirious'.

(160) A: Ce film, il est pourri.
this movie it is rotten
'This movie is rotten'.
B: *Non, il est mauvais, nul, mais pas pourri*
no it is bad, worthless but not rotten
'No, it is bad, worthless, but not rotten'.

(161) A: *Tu prends ta poubelle ou celle de maman?*
You take your garbage can or the one of mum
'Are you driving your garbage, or mum's?'
B: D'abord, ma voiture n'est pas une poubelle, ensuite celle
first my car NEG is NEG a garbage can then the one
de ta mère est presque neuve.
of your mother is almost new
'First, my car is not a garbage, and second your mother's car is almost new.'

In examples (159) to (161), it is not the conceptual meaning that is refuted, but the conditions that enable the lexical entry for a concept to describe a specific referent. In all these examples, speaker A uses a lexical entry to describe the same referent that B wants to describe. Of course, all these words have different implicatures, and all are metaphors for B. When B refuses to use a description *X* for a particular referent *R* and proposes an alternative description *Y*, the negation is metalinguistic, since the test used so far to discriminate metalinguistic and descriptive negation yields a positive result:

(162) I cannot say that *R* is *X*, since *R* is *Y*.

6 French examples will be given, because they are real family usages.

(163) a. I cannot say that he is delirious (because he makes you laugh).
b. I cannot say that this movie is rotten (because it is bad, worthless).
c. I cannot say that my car is a garbage (because it is almost brand new).

This analysis has significant implications, because a conceptual expression encodes conceptual information – or information associated with the description of its referent – as well as procedural information containing instructions on how and when such a concept can be applied to a specific referent. This information is called *procedural* because it describes the *path* by which a specific lexical entry reaches its referent. In all of these examples, B refuses the means of arriving at the referent, and proposes a more conventional way of naming these entities. B refuses to apply the concept DÉLIRER to a situation which can be described by the concept RIRE; the same is true for POURRI vs. MAUVAIS and POUBELLE vs. VOITURE[7].

In general, then, it can be claimed that the meaning of any lexical item includes two components: conceptual information, which describes the concept accessible via the lexical entry; and procedural information, which indicates how to arrive at the concept's descriptive content. Table 15 can consequently be modified as follows in Table 21:

Table 21: Types of meaning, type of categories.

	Type of category	
Type of meaning	**lexical**	**functional**
conceptual	✓ content lexicon	✓ connectives ✓tenses
procedural	✓ content lexicon	✓ indexicals ✓connectives ✓tenses

And if we return to Table 19, the following modifications can be made (Table 22):

The question mark for lexical, procedural, non-truth-conditional meanings is thus resolved: this pertains to the procedural part of lexical items (content lexicon), which is not truth-conditional, as the at-issue information is associated not with the assignment of reference but with the way reference is obtained. For

7 In French, specially used by teenagers, *pourri* with the meaning 'worthless' and *délirer* with the meaning 'to laugh' are recent meanings, whereas the use of *poubelle* for 'car' is a more common and conventional way to talk about an old damaged car.

Table 22: Combination of types of meaning.

		lexical	functional
procedural	truth-conditional	×	✓ pronouns ✓ indexicals
	non-truth-conditional	✓ content lexicon	✓ connectives ✓ tenses
conceptual	truth-conditional	✓ content lexicon	✓ connectives ✓ tenses
	non-truth-conditional	illocutionary adverbials	×

instance, the contrast between *voiture* and *poubelle* is a manner of speaking and does not target the reference in use. On the other hand, the impossible relations are lexical, conceptual and non-truth-conditional, because lexical conceptual information is obligatorily truth-conditional, and lexical procedural information is non-truth-conditional – the procedural part of the meaning of lexical items is related to the way of referring and not to the reference itself.

To summarize, here are the principal possible combinations:

- Lexical procedural non-truth-conditional: content lexicon
- Lexical conceptual truth-conditional: content lexicon
- Lexical conceptual non-truth-conditional: illocutionary adverbials
- Functional procedural truth-conditional: pronouns and indexicals
- Functional procedural non-truth-conditional: connectives and tenses
- Functional conceptual truth-conditional: connectives and tenses

7 Conclusion: Conceptual and procedural meaning vs. types of meanings

The last question to be answered is the relation between the different properties of meaning (lexical vs. functional, conceptual vs. procedural, truth-conditional vs. non-truth-conditional) and types of meaning (from entailments to implicatures). Are types of meaning basically conceptual or procedural? Are they carried by lexical or functional items? Are they truth-conditional or non-truth-conditional? The last question has already been answered: there is no correspondence between truth-conditionality and the nature of meaning (semantic vs. pragmatic), because explicatures are truth-conditional and pragmatic presuppositions are non-truth-

conditional. Given that both types of meanings can be lexical and functional, the final issue is whether types of meaning are conceptual or procedural. It should be borne in mind that the types of meanings are all representational: they have a propositional form and, as such, can be evaluated as true or false; so, conditions on truth-conditionality are based on criteria allowing for the evaluation of the inferred proposition's truth or falsity.

In Figure 5 (page 48), linguistically conceptually encoded expressions are *contributions* to explicatures or implicatures, whereas linguistically procedurally encoded expressions are *constraints* on explicatures and on implicatures. So, in Relevance Theory, what triggers is encoded, and what is triggered is either an explicature or an implicature; the outputs of conceptually encoded or procedurally encoded meanings are representations with propositional forms and are thus *conceptual* in nature. But while unambiguously true for conceptual meanings, this is not easily acceptable for procedural meanings: procedural meanings yield instructions as outputs, which is to say injunctions to do so and so. In other words, entailments, presuppositions, explicatures and implicatures are conceptual representations. We do, however, expect the outputs of procedural meaning not to be conceptual representations but instructions yielding meanings like "draw a proposition *p* having property *x*", "look for an entity *e* having property *y*", etc. The status of the inferred meaning – semantic or pragmatic – is propositional, but the nature of the trigger is either a CONCEPT associated with a lexical or a functional item, or an *instruction* associated with a lexical or functional item. Figure 7 summarizes these connections:

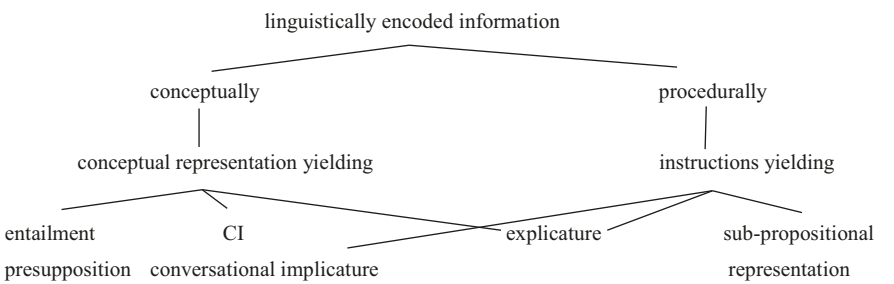

Figure 7: Types of information and types of meaning.

The new category in Figure 7 is sub-propositional representations: as it will be seen with tenses and connectives, the output of the procedural instruction is not representational but sub-representational, or sub-propositional. These outputs are abstracts, containing variables and time directions; as they have to be completed or filled, they are needed to yield complete propositional representations. For instance, the causal relation will be unspecified with respect to time-direction,

whereas the procedural instruction of connectives will fix the causal direction between these variables.

This model, as we will see, is complex, but one significant advantage is that it is compositional: adding a forward or a backward time direction to a relation (CAUSE, TEMPORAL ORDER) provides a complete and full interpretation. In the next chapters, we will have to improve this model empirically, demonstrating how and why it is an efficient way to resolve the issue of the semantics-pragmatics interface.

Part II: **Time and tenses**

3 Temporal reference and temporal order

1 Introduction

One property – if not the primary property – of natural language is the ability to talk about time. Reference, as a relation connecting language to the world, is not only about entities and individuals, but also about states of affairs, like states, activities, accomplishments or achievements (Vendler 1967). References to states and events is therefore one of the main functions of language. The principal consequence of this property of representing states of affairs in a temporally indexed manner, as past, present or future, is that language users can connect events and states in sequences of situations, temporally ordered. This temporal sequencing, called *temporal order*, refers to one of the classic ways of telling stories: *narration*. Where narration is possible, it is mainly because stories are composed of ordered events, the temporal sequencing being one of the main properties of narratives.

One of the main issues, besides the semantic definition of eventualities, is knowing what makes temporal order possible. A principal assumption defended in semantic approaches is that semantic properties of eventualities play a significant role: the aspectual properties of eventualities, as well as tenses, are involved in temporal order. However, the main issue is that neither aspects nor tenses alone are the only possible triggers of temporal order: tenses have multiple usages – some narrative, others non-narrative. This implies that one of the answers to the temporal order issue is located in the semantics and pragmatics areas of tenses. This will be extensively discussed in Chapter 4, where a mixed model exploiting the conceptual/procedural meaning distinction (Chapter 2) will be put forward to resolve temporal order more thoroughly.

This chapter will be devoted to preliminary, albeit necessary, requisites for temporal order. Section 2 will address the question of *temporal reference*: what is it? What is it for? Why is time semantically incorporated in sentence meaning? Is there a one-to-one relation between temporal reference and tenses? The classical logical analysis of tenses will be presented (Reichenbach 1947, 2005), as well as the standard description of aspectual classes (Vendler 1957, 1967). Section 3 introduces the concept of *temporal order*, a concept recently introduced by dynamic semantics, like Discourse Representation Theory (DRT) (see Kamp and Reyle 1993), and absent from traditional and grammatical description of tenses. Even in the textual or enunciative description of tenses (for French, Benveniste 1966; Weinrich 1964, 1973), the concept of temporal order is not present at all, let alone as a property of narratives. The qualitative change,

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introduced by discourse semantics, is the direct consequence of a theory of event representation, which supposes the location of events in time. Even in the first semantic descriptions of tenses, temporal order was not incorporated into the semantic model, mainly because temporal coherence is, as I will argue, based on coreference rather than temporal order. Section 4 will provide the final part of the answer to temporal order in semantics, by discussing an alternative pragmatic solution based on the concepts of conversational implicature and explicature. Finally, section 5 will make the link between temporal order and narration: is temporal order the only way to represent events in narration? The answer to this question will be no, as other phenomena such as represented speech and thought (Banfield 1982) will show that narration is one means of representing events, whereas free indirect discourse (FID) – that is, the representation of a character's thoughts – is about another property of fiction. The relation between narration and FID will be clearly described by investigating personal and temporal references: the use of a third person pronoun; and the use in French of the verbal tense Imparfait (Simple Past in English).

2 What is temporal reference?

Temporal reference is the location in time of eventualities – thus, the state of affairs described in the sentence (Bach 1986). Traditionally, temporal reference is a semantic issue, because the assignation of a temporal index is one property of the semantic interpretation of the sentence, at least in Montague grammar (Dowty 1979; Dowty, Wall, and Peters 1981). As I will show, a pragmatic perspective is still required, even in an approach where temporal information is encoded as variables (points or intervals). My working hypothesis is that the interpretation of temporal variables is part of the inferential process yielding the basic explicature of the utterance. The main question, answered in section 2.1, is what these temporal variables are.

2.1 Montagovian and neo-Davidsonian approaches

In classic Montagovian semantics, temporal variables are indices necessary to attribute a truth value to the sentence. For instance, in (164), which describes a past event, the variable *I* defines to the set of instants defining the model in which a sentence is interpreted. (165) gives the truth conditions for (164) (Dowty, Wall, and Peters 1981: 112–140):

(164) *Brutus stabbed Caesar*.

(165) $[\![\text{P [Stabb (Caesar)(Brutus)]}]\!]^{M,g,I,W} = 1$,
iff Stabb (Caesar)(Brutus) is true at a moment before now,
where P = Past temporal operator, M = the model of interpretation, g the function of variable interpretation, I a set of instants and W a set of worlds.

However, this is not enough, because there is no precise indication that allows the hearer to target the correct moment in the past, which is 15 March, 44 BC. Following (165), (164) could be true of yesterday, Monday 3 April 2018. From a strict point of view of reference assignment, temporal reference must therefore include a pragmatic dimension. One solution might be exactly cognitively analogous to what I did to check the date: to consult an encyclopaedia. So, the concept JULIUS CAESAR has an encyclopaedic entry, where the information about his death is available. If it is not, then the temporal interpretation will be less exact. I can, for instance, infer that it was during the first century BC. An alternative, neo-Davidsonian approach to temporal reference (Parsons 1990: 3) gives the following information (166), which corresponds to subatomic semantics. In this analysis, tensed sentences are interpreted as existential quantifications over events, and include thematic roles for the arguments, as well as a function of culmination, where (167) is the formal version of (166):

(166) For some event e,
e is a stabbing, and
the agent of e is Brutus and
the object of e is Caesar and
e culminated at some time in the past.

(167) $\exists$e [Stabbing(e) $\wedge$ Agent(e, Brutus) $\wedge$ Object(e, Caesar) $\wedge$ Culminated (e, before now)]

Taking a simpler sentence like (168), with description (169), the logical form (170) clearly indicates that the argument (subject), the verb and the tense are expressed as conjuncts in the logical form (Parsons 1990: 6).

(168) *Caesar died*.

(169) For some event e,
e is dying, *and*
the object of e is Caesar, *and*
e culminated before now.

(170) ∃e [Dying(e) ∧ Subject(e, Caesar) ∧ Culminated(e, before now)
↑ ↑ ↑ ↑
DEFAULT VERB SUBJECT TENSE

This analysis has two advantages: first, temporal reference is a variable bound by a quantifier; the second advantage is that the subatomic semantics decomposes semantic information into (i) the quantification over an event (∃e), (ii) the denotation of an unanalysed event predicate, (iii) the assignation of a semantic role to the verb's arguments, and (iv) the specification of the tense's content (culmination for events, holding for states). The implications of these advantages bear discussion.

First, tensed sentences are quantifications over events. The rationale for this analysis comes from Partee (1984), who showed a close parallelism between temporal and nominal anaphora. She cited four parallel cases: (i) non-linguistic antecedents, (ii) definite anaphors with definite descriptions, (iii) indefinite antecedents and (iv) bound variables. The first case is illustrated in (171), uttered without "previous linguistic context". As she explains, "[171a] uttered while driving down the freeway; [. . .] (171b) uttered as the first sentence of a conversation" (Partee 1984: 244):

(171) a. *I didn't turn off the stove*.
b. *She left me*.

The second case is illustrated when a pronoun (*he*) is interpreted in relation to a noun phrase functioning as its antecedent, *Sam* in (172a); the same is the case for the temporal domain. In (172b), "a time is specified in the first clause and the second clause is most naturally understood as referring to the same time" (Partee 1984: 245):

(172) a. *Sam is married. He has three children*.
b. *When John saw Mary, she crossed the street*.

The third case – indefinite antecedents – is illustrated in (173), where the sentences are true if the indefinite *a donkey* means "at least one donkey" and *sometime during the night* "at least once during the night":

(173) a. *Pedro owns a donkey. He beats him*.
b. *Mary woke up sometime during the night. She turned on the light*.

Finally, bound variables are illustrated in (174): *she* is bound by the quantified phrase *every woman* (*she* is a woman), and *Sam was asleep* is bound by *whenever*.

(174) a. *Every woman believes that she is happy*.
b. *Whenever Mary telephoned, Sam was asleep*.

Essentially, quantifying over events is as legitimate as quantifying over individuals. In other words, events are entities: they can be quantified, and they receive a truth value.

The second advantage of the subatomic semantic analysis is that event representations must be connected to a typology of eventualities. Parsons (1990) has only two functions for eventualities expressed by tenses: culmination (where eventualities culminate in an endpoint) and holding (where eventualities are only developments and hold for a temporal interval). In order to understand the relation between events and properties as one of culmination and development, a fine-grained aspectual analysis of verbs is required.

2.2 Aspectual classes

The first eventuality classification was proposed by Vendler (1957, 1967), distinguishing *states, activities, accomplishments* and *achievements*. In most approaches to event semantics (like Parsons' subatomic semantics), these distinctions are used, whereas some more global approaches to discourse semantics restrict themselves to states and events.

Vendler has a typical inductive analysis, looking for linguistic tests. The first opposition is between the questions *for how long did he V?* vs. *how long did it to V?*, where the former makes sense for pushing a cart, but not for drawing a circle. The initial distinction is between *activity terms* (*running, pushing a cart*) and *accomplishment terms* (*running a mile, drawing a circle*). The second distinction is between processes without a limited duration, like knowing or recognizing, and verbs that "can be predicated only for single moments of time [. . .] One reaches the hilltop, wins the race, spots or recognizes something, and so on at a definite moment" (Vendler 1957: 146). *Reaching a hilltop* is an *achievement*, whereas *loving* is a *state*. In summary, Vendler (1957: 149) gives the following definitions for these four types of *aspectual classes*:

For activities: "*A* was running at time *t*" means that time instant *t* in on a time stretch throughout *A* was running.

For accomplishments: "*A* was drawing a circle at *t*" means that *t* is on *the* time stretch on which *A* drew that circle.

For achievements: "*A* won the race between t_1 and t_2" means that *the* time instant at which *A* won that race is between t_1 and t_2.

For states: "*A* loved somebody from t_1 to t_2" means that at any instant between t_1 and t_2 *A* loved that person.

This shows that the concept of activities calls for periods of time that are not unique or definite. Accomplishments, on the other hand, imply the notion of unique and definite time periods. In an analogous way, while achievements involve unique and definite time instants, states involve time instants in an indefinite and non-unique sense.

Other tests have been used in the literature on aspectual classes (Comrie 1976; Dowty 1979; Smith 1991;Verkuyl 1993; Rothstein 2004, to name but a few):

- *Progressive*: only states do not occur in progressive form (as already observed by Vendler). For achievements, the progressive does not target the event, but the previous state: if *Mary is reaching the summit*, she is not yet at the summit.
- *Temporal complements with in* vs. *for: John was running for/*in two hours* vs. *John has built his house in/*for one year*.
- *Entailments from imperfective aspect*, the so-called imperfective paradox (Dowty 1979): from *John was pushing a cart*, the entailment "John pushed a cart" is true, but from *John was building a house*, the entailment "John built a house" is not true.
- *Homogeneity*: states and activities are homogeneous, accomplishments are not, and achievements are not relevant for this test, because they are punctual.
- *Boundedness*: states and activities are unbounded, whereas accomplishments are bounded, and achievements can be neither bounded nor unbounded.
- *Telicity*: finally, states and activities are not telic (they have no culmination), but accomplishments and achievements are (see Depraetere 1995 on telicity and boundedness).

Table 23 is a short survey of these tests (see Dowty 1979: 60 for a more complete picture). It confirms that the only significant differences between accomplishments and achievements are the boundedness and homogeneity features, which do not apply to achievements (because they have no temporal extension). Nevertheless, the table also shows the close link between states and activities, identical but for the progressive test:

Table 23: Properties of aspectual classes.

	progressive	*in* N_{time}	*for* N_{time}	entailment	boundedness	telicity	homogeneity
states	–	–	+		–	–	+
activities	+	–	+	+	–	–	+
accomplishments	+	+	–	–	+	+	–
achievements	+	+	–	–		+	

These aspectual classes can be placed in a hierarchy, as summarized by Mouretalos (1981: 201) in Figure 8:

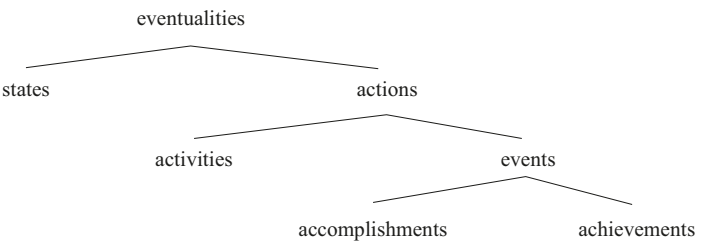

Figure 8: A hierarchy of aspectual classes (based on Mouretalos 1981).

Of course, more precise classifications (like Bach 1981) have been proposed, but the most influential classification remains Vendler's, with good linguistic reason. One of the positive contributions made by Vendler's system is the development of event semantics based on the relation between aspect and lexical semantics (see, for instance, Levin 1993 and Rothstein 2004 for a very fine-grained semantic analysis of aspectual verb classes).

2.3 Temporal coordinates (Reichenbach)

The last seminal contribution to temporal reference was proposed by Reichenbach, the first to have created a precise description of tenses based on temporal coordinates. Reichenbach's classification (1947) first distinguished the *point of speech*, which is defined as the "time point of the token" (*S*) (Reichenbach 2005: 72). But as the temporal relations before *S*, simultaneous to *S* and after *S* give only three tenses – which is not enough – Reichenbach introduces two other coordinates: the *point of the event* (*E*); and the *point of reference* (*R*). "From a sentence like 'Peter had gone' we see that the time order expressed in the tense does not concern one

event, but two events, whose position are determined with respect to the point of speech" (Reichenbach 2005: 71). The relation between *S, E* and *R* is described in the Past Perfect as *E—R—S* (where '—' stands for the precedence relation). For the Simple Past (*I saw John*), the relation is *R, E—S* (where ',' means simultaneous); for the Present Perfect, *E—S, R*; for the Present, *S, R, E*; for the Simple Future, *S—R, E*; and for the Future Perfect, *S—E—R*.

The second principal contribution made by Reichenbach is his addition of a certain aspectual property, a stretch of time, where (i) *E* and *R*, (ii) *E* or (iii) *E, R* and *S* describe intervals. For instance, the difference between the French Imparfait (*je voyais Jean* 'I saw John') and the Passé Simple (*je vis Jean* 'I saw John'), which have the same coordinate relation (*R, E—S*), is the time extension for *E, R*, which does not denote a point but an interval.

Reichenbach's third contribution is his analysis of sequences of tenses. His idea is that sequences of tenses require the "permanence of the reference point". For instance, (175) is analysed as (176):

(175) *I had mailed the letter when John came and told me the news*.

(176) 1st clause: $E_1—R_1 \quad —S$
2nd clause: $R_2, E_2—S$
3rd clause: $R_3, E_3—S$

E_1 is *I had mailed the letter;* E_2*, John came*; and E_3*, he told me the news.* E_1 precedes E_2 and E_3, which are simultaneous, whereas all three points of reference (R_1, R_2 and R_3) are simultaneous. When *S* is permanent but *R* and *E* different, the sequence of tenses is also consistent, creating another type of situation:

(177) *He was healthier when I saw him than he is now*.

(178) 1st clause: $R_1, E_1—S$
2nd clause: $R_2, E_2—S$
3rd clause: S, R_3, E_3

The final advantage of Reichenbach's proposal is that tenses can be described with *S, E* and *R* coordinates. The principal idea is that "the position of R relative to S is indicated by the words 'past', 'present', and 'future'" (Reichenbach 2005: 77). He proposes that the words 'anterior', 'simple' and 'posterior' be used to denote the relation between *E* and *R*. Reichenbach's analysis is represented in the following tree:

While Reichenbach claimed that the concept of *Posterior Past* has no tense in English, it in fact corresponds to the conditionals. Neither English nor

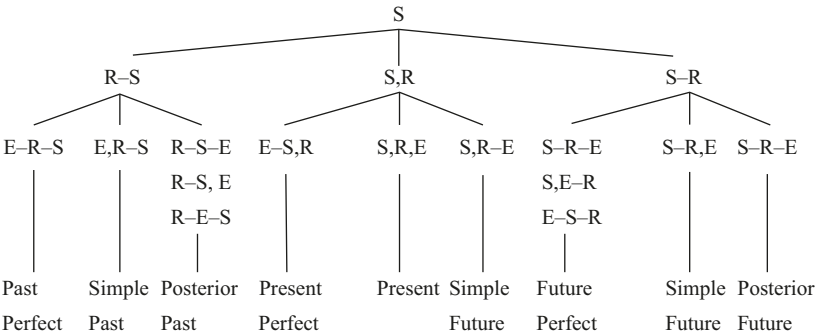

Figure 9: Reichenbach's analysis of tenses.

French has a tense for the Posterior Future; however, Latin does, as illustrated by *abiturus ero*, meaning "I shall be one of those who will leave" – the French translation being 'je suis sur le point de partir'.

For Reichenbach, there is a clear logical foundation for the semantics of tenses, despite the imperfection of language, as the final sentences of his chapter on tenses show (Reichenbach 2005: 78):

> The history of language shows that logical categories were not clearly seen in the beginning of language but were the results of long developments; we therefore should not be astonished if actual language does not always fit the schema which we try to construct in symbolic logic. A mathematical language can be coordinated to actual language in the sense of an approximation.

That said, some criticisms can be made of this classification, even though most semantic descriptions of tenses use the Reichenbachian coordinates (Molendijk 1990; Saussure 2003 for French; Hornstein 1990; Vikner and Vikner 1997 for English, a.o.). Here are some of the most serious drawbacks (Comrie 1981):

a. The first criticism is about the relation of *precedence*, which is a qualitative one. Some languages, like Luganda, a Bantu language, and Yandruwandha, an Australian language, make the difference between degrees of remoteness in the past and the future; temporal precedence must therefore be understood in a quantitative as well as a qualitative manner. Comrie proposes introducing the notion of *degree of precedence*.[1]

1 This is not too far from the 24 hours rule of classic grammarians in the French tradition. The rule is simple: "if an event occurred 24 hours before the point of speech, then the tense to be used is the Passé Composé (Present Perfect). Beyond 24 hours, use the Passé Simple (Simple Past)".

b. A lot of languages have relative time. Comrie gives the example of Classical Arabic, which has an imperfect tense indicating an overlap between *R* and *E*, disconnected from *S*. As such, the relation between *R* and *S* is not needed to determine the basic temporal forms.
c. In Reichenbach's system, there are three representations for the Future Perfect. However, this defect can be addressed if different interpretations can be given to the same form. In example (179), there are three interpretations, given in (180), where *R* is denoted by *tomorrow* and *E* by the moment at which the paper is finished:

(179) A: *Will John have finished his paper for tomorrow?*
B: *Yes*.

(180) a. John finishes his paper between the moment of B's answer and tomorrow: *S—E—R*.
b. John finishes the paper at the moment of B's answer: *S, E—R*.
c. John has already finished his paper: E—S—R.

However, for Comrie, these temporal structures do not account for the conversational implicature of the Future Perfect, which is "the speaker is not certain that *E* is already the case". So, for Comrie (1981: 26), the precedent relation between S and E (*S—E*) does not belong to the meaning of the perfect future, and the relation between *E* and *S* is thus not relevant.
d. The use of the conditional gives rise to a similar issue. For the Conditional Perfect, not one but two points of reference are required. (181) is analysed as (182):

(181) *John left from the front; by the time he returned, the fields would have been burnt to stubble*.

(182) a. *E*: the fields burn.
b. R_1: posterior to *E* and simultaneous to John's return, i.e. the point from which *E* is seen.
c. R_2: anterior to R_1 and simultaneous to John's departure, i.e. the point from which R_1 is seen.
d. *S*: posterior to R_2.
e. temporal structure: $E—R_1$, $R_2—R_1$, $R_2—S$.

e. The last but the most radical criticism is that *R* is not necessary to describe basic tenses, at least for absolute tenses (*R* is necessary only for relative tenses). In Reichenbach, the main difference between the (Present) Perfect and

the (Simple) Past is the location of *R*: in the Perfect, *R* is simultaneous to *S*, whereas in the Past, it is simultaneous to *E*. But in both cases, the relation between *E* and *S* is the same: *E* precedes *S*, putting both in the category of past tenses. So, basic tenses are *S*, *E* (present), *E*—*S* (past) and *S*—*E* (future). Comrie's argument is that in spoken French, the Passé Composé has become the basic past tense. For Comrie, the difference between the Past and the Perfect is that the past situation has present relevance. This effect, known as the "aspectual result", can be shown in (183) (Moeschler et al. 1998):

(183) *Victor Hugo a écrit Les Misérables.*
Victor Hugo has written Les Misérables
'Victor Hugo wrote Les Misérables'

It is still true that *Les Misérables* has been written by V. Hugo at the point of speech; so, the effect of the French Passé Composé is that the resulting state is still active and true at *S*. However, a resultative after-effect is generally not always relevant in the ordinary use of the Passé Composé. (184) does not mean that the state resulting from a good night is still the case; basically, what my utterance implicates is that I am rested.

(184) *J'ai bien dormi.*
I have well slept
'I slept well'.

So, Comrie proposes the use of two semantic relations between coordinates (overlap and precedence), only *E* and *S* for absolute tense, and *R* for relative tenses. Here is his description for English tenses:

(185)

Tense	*Structure*	
present	E overlaps S	$E \supseteq S$
(simple) past	E precedes S	E—S
future	E follows S	S—E
past perfect	E precedes R which precedes S	E—R, R—S
future perfect	E precedes R which follows S	E—R, S—R
future in the past	E follows R which precedes S	R—E, R—S
past conditional	A precedes R_1 which follows R_2 which precedes	E—R_1, R_2—R_1, R_2—S

One positive conclusion is that the semantics of tenses seems to be described in a more accurate way by splitting the three Reichenbachian coordinates. This is the approach we are going to follow in Chapter 4, when giving a precise description of French tenses.

3 What is temporal order?

As demonstrated in section 2, one of the major problems in determining temporal reference is the semantic contribution of tenses. Three classical approaches to temporal reference have been discussed: (i) a logical one, based on the idea that temporal reference is the result of an existential quantification over events; (ii) the aspectual approach, giving a key role to lexical aspect when determining temporal reference; and (iii) the Reichenbachian account of tenses, which is based on three coordinates – the point of speech (*S*), the point of reference (*R*) and the point of event (*E*).

Apart from the issue of the sequence of tenses, no empirical findings resulting from temporal order have been made. However, it has long been argued that the semantics of verbal tenses are linked to discourse relations – that is, temporal relations between eventualities. Consider three ways of expressing a past event in French, as in (186)-(188):

(186) *Marie avait téléphoné.*
Mary had called.
'Mary had called'.

(187) *Marie téléphonait.*
Mary call-IMP
'Mary was calling'.

(188) *Marie téléphona.*
Mary call-PS
'Mary called'.

So, what is the semantic difference? In all three cases, the event is past, but the aspectual properties are not the same. In (186), the activity of calling is a resulting event; in (187), the activity of calling holds; and in (188), it is completed. These properties are certainly due to the choice of the verbal tense. As for the

contribution of tense to temporal relations, the test to determine this is to relate each of these sentences to a previous one, as in (189) to (191):

(189) *Jean entra dans la chambre. Marie avait téléphoné.*
John enter-PS in the room Mary had called
'John entered the room. Mary had called'.

(190) *Jean entra dans la chambre. Marie téléphonait.*
John enter- PS in the room Mary call- IMP
'John entered the room. Mary was calling'.

(191) *Jean entra dans la chambre. Marie téléphona.*
John enter-PS in the room Mary call-PS,
'John entered the room. Mary called'.

This provides an initial answer to our question. In (189), there is a backward temporal relation: Mary's calling precedes John's entering the room. In (190), there is an inclusion, or overlap, relation: John entering the room is included in the event of calling. And in (191), there is a forward temporal relation: the calling follows his entering the room. In chapter 4, we will qualify these relations respectively as *backward, inclusive* and *forward* temporal inferences. (191) is the classic example of *temporal order*.

This constitutes a decisive step in the comprehension of temporal reference. It is crucial that the determination of temporal reference includes the temporal relation between eventualities; as such, one of the major issues is whether the aspectual properties of eventualities play a role in such a construct, and how temporal coordinates connect more generally. The final issue to resolve is the exact contribution of tenses to these relations. Figure 10 tentatively represents the situation described in examples (189) to (191) with an approximate schematic (Kamp and Rohrer 1983):

3.1 Tenses and temporal order

The first issue to debate is the contribution of tenses to temporal relations; the second is the contribution of aspectual classes. This former was first discussed in Kamp and Rohrer (1983) and in Tasmowski-de Ryck (1985) with respect to French verbal tenses. The main assumption is that semantic rules are attached to verbal tenses allowing the construction of discourse representation structures (DRS) (see Kamp and Reyle 1993 for the general presentation of Discourse

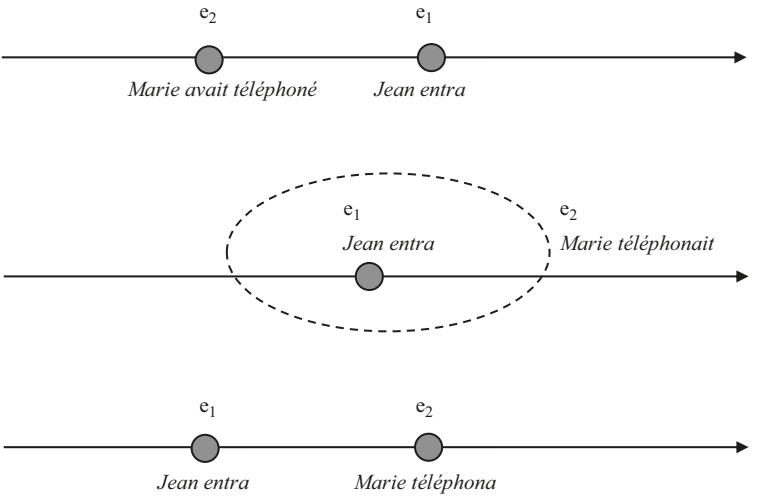

Figure 10: Temporal relation and aspectual properties.

Representation Theory). Simply put, with the Passé Simple, a new DRS is introduced introducing a new reference point; with the Imparfait, the new DRS includes a previous one containing a reference point which is conserved; and with a Plus-que-Parfait, the reference point of the preceding DRS is conserved, but the point of the event is located before the current R. These rules can be translated as follows (from Moeschler 2000b, based on Tasmowski-de Ryck 1985):[2]

Rule of the French Passé Simple (PS)

a. The PS sentence introduces a new event e_i.
b. e_i is anterior to the speech point S.
c. e_i is posterior to the previous event e_{i-1}.
d. The reference point R_{i-1} associated with e_{i-1} is replaced by R_i associated with e_i.

Rule of the French Imparfait (IMP)

a. The IMP sentence introduces a new state in the discourse, s.
b. s is anterior to the speech point S.
c. s contains the last event e introduced by a PS sentence.
d. The reference point R associated with e is the reference point of the discourse.

2 Kamp and Rohrer (1983) are semi-formal in the presentation of rules for French tenses.

Rule of the French Plus-que-Parfait (PQP)
Introduce a new event E in the past of the reference point R.

To summarize, the following rule applies to French past tenses:

Temporal order and French verbal tenses
Time moves forward with PS, does not move with IMP, and moves backward with PQP.

This proposal is very stark: if the rules of the tenses are semantic, they are not defeasible. Kamp and Rohrer (1983) give a lot of apparent counter-examples, but some are difficult to resolve. For instance, in (192), even if the conjuncts are in the PS, there is no temporal order between the two events, as singing and playing the piano constitute a joint event. In (193), the interpretation of the IMP gives rise to a forward reading. Finally, in (194), there is a forward interpretation between the events in the PQP. In other words, if the rules applied to verbal tenses are defeasible, this must be because they are more pragmatic than semantic:

(192) *Bianca chanta l'Air des bijoux et Igor l' accompagna*
Bianca sing-PS the Air of jewels and Igor her accompany-PS
au piano.
at-the piano
'Bianca sang the Air of Jewels and Igor accompanied her on the piano.'

(193) *Le juge alluma une cigarette. La fièvre donnait au tabac*
the judge light-PS a cigarette the fever give-IMP at-the tobacco
un gout de fiel.
a taste of gall
'The judge lit a cigarette. The fever gave the tobacco a taste of bile.'
(Roger Vailland, *La Loi*, 1957)

(194) *Ce mardi de juin où il fut assassiné, l'architecte Lamberto Garrone regarda plus d'une fois l'heure.*
Il avait commencé en ouvrant les yeux dans l'obscurité de sa chambre, où les volets hermétiquement clos ne laissaient pas filtrer le moindre rayon de lumière. Pendant que sa main, maladroite d'impatience, remontait le cordon à la recherche de l'interrupteur, il avait tremblé, absurdement, qu'il ne fût trop tard, déjà trop tard pour téléphoner.
(Fruttero & Lucentini, *La femme du dimanche*, Paris, Seuil, 1973, 7)

> 'That Tuesday in June on which he was murdered, Signor Garrone, the architect, looked at his watch many times. He had begun by opening his eyes in the pitch darkness of his bedroom, where the carefully sealed window did not allow a ray of light to penetrate. While his hand, clumsy with impatience, groped along the loop of wire, hunting for the switch, the architect was seized by an irrational fear: it was terribly late, the moment for his telephone call had already gone by.'
> (Fruttero & Lucentini, *The Sunday woman*, translated by William Weaver, Glasgow, Collins, 5)

These examples are interesting because they are true counterexamples, meaning that there is something in the semantics of tenses that (i) does not command temporal order for PS, and (ii) does not block temporal order for IMP and PQP. In other words, an adequate model for the semantics of tenses must be interwoven with their pragmatics, and factors other than those attached to tense play a role in temporal inferences. The model discussed in Chapter 4 has exactly this ambition, connecting the semantics of tenses, relevant for temporal reference, and their pragmatics, relevant for temporal inferences.

3.2 Aspectual classes and temporal order

Another proposal comes from a semantic tradition, that of Montague semantics, which argues that temporal order is the consequence of the aspectual class of the sentence. Dowty (1986) makes the following comparison:

(195) *John entered the president's office. The president walked over to him.*

(196) *John entered the president's office. The president woke up.*

(197) *John entered the president's office. The president sat behind a huge desk.*

(198) *John entered the president's office. The clock on the wall ticked loudly.*

His analysis is that time goes forward with accomplishment (195) and achievement (196) follow-up sentences in the discourse (so temporal order is the case), whereas with stative verbs (197) and activity verbs (198) "narrative time does not 'move' in the second sentence" (Dowty 1986: 38); as such, aspectual classes play a major role in temporal order. This initial analysis is confirmed: the English progressive blocks temporal order – (199) and (200) –, no matter whether the predicate is an

activity (199) or an accomplishment (200), whereas some stative verbs, when are interpreted as achievement predicates (201) or when they co-occur with adverbials like *suddenly*, may trigger temporal order (202).

(199) *John entered the president's office. The president was looking out the window.*

(200) *John entered the president's office. The president was writing a letter.*

(201) *John entered the president's office. The president realized why he had come.*

(202) *John sat in a chair going over the day's perplexing events again in his mind. Suddenly, he was asleep.*

The first step in Dowty's analysis is the redefinition of aspectual classes with interval semantics (Dowty 1986: 42):

(a) A sentence φ is stative iff it follows from the truth of φ at an interval I that φ is true at all subintervals of I. [. . .].
(b) A sentence φ is an activity (or *energia*) iff it follows from the truth of φ at an interval I that φ is true of all subintervals of I down to a certain limit in size [. . .].
(c) A sentence φ is an accomplishment/achievement (or kinesis) iff it follows from the truth of φ at an interval I that φ is false at all subintervals of I. [. . .]

How can we explain the relation between intervals and temporal order? First, the clause (c) does not allow any part of the temporal interval to define an accomplishment because the event is not true of any of its parts, and achievements cannot be subdivided into parts (they are punctual); accomplishments and achievements thus have to be taken *globally*. In connection with another event, the only possible temporal relation (other than simultaneity) is temporal order – either forward with the Simple Past, or backward with the Pluperfect.

Second, we can explain the possible overlap when an activity or a state sentence follows an event sentence by the fact that a subinterval is true of the predicate, and in particular the interval overlapping with the event predicate. In that case, a subinterval is true of the complete interval described by the event predicate. The inclusive effect (the activity/state is true before and after the event) is a consequence of the temporal indetermination of the activity/state predicate: they are located within the point of reference of the current event. If

we take the entering-calling relation, what is relevant is the exact overlap between these two events, as represented in Figure 11:

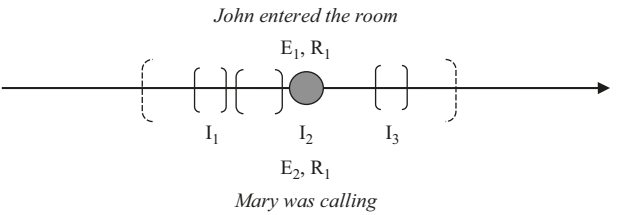

Figure 11: Temporal overlap in temporal order.

(203) *John entered the room. Mary was calling.*

In this interpretation, what is relevant is not that the calling event is an extended one, but that it is synchronous with the entering event. This is predicted by the interval analysis: E_1 is simultaneous with E_2 occurring at the subinterval I_2. The fact that *Mary was calling* is true before or after *John entered the room* is a pragmatic consequence of the semantic definition of an activity.

One essential consequence of the aspectual analysis of temporal order is the explicit move towards a pragmatic approach. This leads Dowty to formulate a discourse interpretation principle, the TDIP (temporal discourse interpretation principle, Dowty 1986: 45):

> *Temporal discourse interpretation principle*
> Given a sequence of sentences S_1, S_2, . . ., S_n to be interpreted as a narrative discourse, the reference time of each sentence S_i (for i such that $1 < i \leq n$) is interpreted to be:
> (a) a time consistent with the definite time adverbials in S_i, if there are any;
> (b) otherwise, a time which immediately follows the reference time of the previous sentence S_{i-1}.

Beginning with the first case (a), the temporal adverbial *at 2 PM* in (204) indicates the reference time of S_2:

(204) *John arrived at 10 AM. He departed again at 2 PM.*

In the case of an accomplishment, as in (205), "the reference time of the second time is immediately after that of the first sentence" (Dowty 1986: 47), meaning

that no temporal interval is possible between the two reference points, as shown in (206):

(205) *John entered the president's office. The president walked over to him.*

(206) # *John entered the president's office. The president walked over to him. In the meantime, the telephone rang.*

Critically, the TPID's prediction does not seem to fit the initial observations. How can it be explained that a stative sentence does not have a temporal forward effect, as in (207)?

(207) *Mary entered the president's office. There was a bound copy of the president's budget on his desk.*

In fact, Dowty (1986: 49) applies the TDIP to any type of aspectual classes:

> Indeed, I propose that for many stative predicates in many discourse contexts, when the stative is asserted to obtain at a certain point in a discourse, the normal assumption the hearer makes is that the stative began to obtain in advance of this point, perhaps well in advance of it. So in the discourse [207], [. . .] I argue that the TDIP actually tells us that the time of the budget's being on the president's desk was immediately after Mary entered the room, but that we are expected to assume in addition that this was not the first moment that it was there: it was no doubt there before Mary's entry.

In other words, the TDIP – without a temporal adverbial – obligatorily applies, even with stative and activity sentences. A further question therefore arises: what does "the time of the budget's being on the president's desk was immediately after Mary entered the room" actually mean? The simplest and and most convincing explanation is that the temporal order reading is a *perspectival* one: the presence of the President's budget is made available only because Mary entered the room and *saw* it. This is a subjective reading similar to the judge's example in (193).

A final point remains to be discussed if the aspectual theory of temporal order is to be adopted: what is the difference between English and French? The main difference is that, in French, accomplishment/achievement sentences are most frequently in the Passé Simple, where state/activity sentences are most often in the Imparfait. So, there seems to be a tense bias, because the French Imparfait is compatible with a subjective reading; where the subjective reading in English is made available thanks to a general discourse interpretation

principle, in French there is a semantic bias favouring the subjective reading with the Imparfait.[3]

However, as has been argued, the most important advantage of the TDIP is that such a semantic analysis is more pragmatic and inferential than compositional. This is the conclusion drawn by Dowty (1986: 60), even though the exact nature of the relation between compositional semantics and inferential pragmatics is not made explicit: "[...] since pragmatic inferences play a role in determining the ordering of events conveyed by a discourse, then, given that these inferences cannot be drawn without the hearer's having grasped the meanings of sentences to some extent, construction of implicature as well as literal semantic interpretation is needed for discourse ordering". Dowty therefore acknowledges that temporal order is not an issue of compositional semantics, but the result of a pragmatic inference. The main problem is that this requirement is difficult to satisfy, as next section will show.

4 Pragmatic approaches to temporal order

As expected, an alternative to the compositional semantics approach to temporal order is a pragmatic one – classically, a Gricean one. Grice (1981: 186) hints that implicature may provide a solution:

> [...] there is a general supposition which would be subsidiary to the general maxim of Manner ("Be perspicuous.") that one presents one's material in an orderly manner and, if what one is engaged upon is a narrative (if one is talking about events), then the most orderly manner for a narration of events is an order that corresponds to the order in which they took place. So, the meaning of the expression *He took off his trousers and he got into bed* and the corresponding expression with a logician's constant "&" (i.e. "he took off his trousers & he got into bed") would be exactly the same.

What is required here is precisely the difference between what is *said* (Chapter 1) and what is *implicated*. Grice proposes a cancellation test for implicature where no contradiction should result; for instance, (208) uses a *but*-clause to cancel the implicature without contradiction. On the other hand, it is also possible to make the temporal implicature explicit with a temporal connective and *then*:

(208) *He took off his trousers and he got into bed, but I don't mean to suggest that he did those things in that order.*

3 See Grisot (2017) for a discussion of the subjective interpretation of tenses on the basis of annotation experiments carried out on French past time verbal tenses, the English Simple Past and perfective/imperfective grammatical aspect in Serbian.

(209) *He took off his trousers and then he got into bed.*

The idea is that temporal order in narratives is the result of a conversational implicature, and the maxim of conversation which is at stake is the sub-maxim of manner "Be orderly". This proposal contrasts with the two previous semantic approaches to temporal order; from Grice's perspective, temporal forward inference is neither the effect of verbal tenses or aspectual classes, nor the default application of a specific discourse principle like the TDIP, but the result of a general principle of communication, the Cooperative Principle. There are serious objections to this analysis, first raised by Cohen (1971) and furthered by Wilson and Sperber (1998, 2012: 169–186). If temporal order is the result of an implicature, the "and then" interpretation of *and* does not contribute to the truth conditions of the utterance; so, if the "and then" meaning does contribute to the truth conditions of utterances, it cannot be an implicature. This is exactly what Cohen (1971) has shown, with the following examples:

(210) a. *If the old king has died of a heart attack and a republic has been declared, then Tom will be quite content.*
b. *If a republic has been declared and the old king has died of a heart attack, then Tom will be quite content.*

In other words, while the implicature theory predicted that (210a) and (210b) should have the same truth conditions (that is, they should describe the same situation), this is not the case; the "and then" meaning does contribute to truth conditions and is thus not an implicature. Note that this conclusion is not an argument against Grice's idea that the meaning of *and* is its logical meaning: *P and Q* is true if and only if both conjuncts are true, as shown in Table 24.

Table 24: The logical meaning of the conjunction *and*.

P	***Q***	$P \wedge Q$
1	1	1
1	0	0
0	1	0
0	0	0

Wilson and Sperber (2012: 171) give other examples where *and* does play a role in the truth conditions of the utterance:

(211) *It is always the same at parties: either I get drunk and no-one will talk to me or no-one will talk to me and I get drunk.*

(212) *What happened was not that Peter left and Mary got angry but that Mary got angry and Peter left.*

(211) is not redundant, and (212) is not a contradiction. Wilson and Sperber (2012: 171) conclude that "Such examples create a serious problem for Grice. Something which according to him is an implicature appears to be falling within the scope of logical operators and connectives. That is, it appears to be contributing to the truth conditions of the utterance as a whole – in Grice's terms, not to what was implicated but to what was said." So, if the contribution of *and* is not an implicature, to what type of meaning does it contribute? The hint in the quotation from Wilson and Sperber is *what is said*: what is said, in Relevance Theory, is equal to *explicatures* (see Chapter 1). My conclusion follows a similar direction: temporal order is a pragmatic issue, not a semantic one.

Note that this pragmatic approach contrasts with another semantic model named *semantic command* (Bar-Lev and Palacas 1980). According to this approach, the semantic command can be formulated as "the second conjunct is not prior to the first (chronologically or causally)" (Bar-Lev and Palacas 1980: 141). However, this command is ruled out in examples (213) and (214), where the second conjunct temporally precedes and causes the first:

(213) Peter: *Did John break the glass?*
Mary: *Well, the glass broke, and John dropped it.*

(214) *I got caught, and my best friend betrayed me.*

So, the idea of a semantic command is too forceful a meaning for *and*. And even if a pragmatic account could theoretically confirm the idea that *and* triggers a generalized conversational implicature analysis (as in Levinson 1983: 146), Cohen's examples cannot be explained by such an incremental analysis:

Levinson's proposal
Given *P and Q*, try interpreting it as
(i) 'P and then Q'; if successful, try:
(ii) 'P and therefore Q'; if successful try also:
(iii) 'P, and P is the cause of Q'.

However, at this point we face a new issue. What is the nature of the pragmatic principles allowing for the temporal order interpretation? Temporal order, as

we have seen, is the relation between events; these events have a PAST feature, and they belong to a narration. The issue is whether we infer temporal order because of a general pragmatic principle (the cooperative principle or the principle of relevance), or whether the temporal order interpretation is linked to narration. This is the topic of the last section of this chapter.

5 Temporal order and narration

In her seminal book on Free Indirect Discourse (Representation of Speech and Thought), Ann Banfield (1982) clearly differentiated narration from communication. Her principal idea is that communication implies the presence of a hearer, linguistically marked by the presence of the second person singular pronoun. Logically, *you* entails *I*, because uttering *you* implies *I*, a speaker designated by a first person pronoun. However, the occurrence of *I* does not entail *you*, as the existence of a speaker does not require the existence of an addressee (see chapter 2 about the procedural nature of the meaning of first-person pronouns). Banfield's analysis is in stark contrast with a classic structuralist analysis of pronouns and tenses, as in Benveniste (1966). Benveniste makes two significant claims, one about the pronominal system in natural language, and the other about the system of tenses.

- *Pronouns*: only the first and the second person pronouns are personal – that is, refer to real people functioning in the roles of speaker and addressee. As a consequence, a third person pronoun is non-personal; among true personal pronouns, only the first-person pronoun is subjective, which is to say referring to a subject (in a loose philosophical sense).
- *Tenses*: tenses belong to two layers of uttering (*plans d'énonciation*): the story (*histoire*) and the discourse (*discours*). In a discourse, all personal pronouns and tenses are allowed, other than the aorist (French Passé Simple). By contrast, in a story the present is excluded, as is the first-person pronoun.

Vigorous objections have been made to these assumptions. First, the Present is commonly used in narration, in the so-called Historical Present (see Chapter 4 for an extensive analysis). Second, what is excluded in a story is the second person pronoun. One exceptional and systematic use of a second person pronoun, referring to the main character, is Michel Butor's *La modification* (*A Change of Heart*). Here is the first sentence of his novel:

(215) *Vous avez mis le pied gauche sur la rainure de cuivre, et de votre épaule droite vous essayez en vain de pousser en plus le panneau coulissant.*
'You have moved your left foot onto the copper groove, and with your right shoulder you are also trying in vain to push the sliding panel.'

Typically, when a second person pronoun is used in narration to refer to the reader, it is a means by which the author can remind her reader where they are in the narrative. Many such examples have been given in Vuillaume (1990: 60), as in (216):

(216) *Maintenant, voulez-vous avoir l'idée de l'importance réelle que prend un tel événement?*
Entrez, le même soir, cher lecteur, dans la maison de l'une des personnes qui ont passé cette voiture [. . .]. (Alexandre Dumas, *Les Mohicans de Paris*, 168)
'Now, do you want to realize the true importance of such an event?
Come, the same night, dear reader, into the house of one of the people who passed this car [. . .].'

The assumption made by Vuillaume is that these utterances do not belong to the *main* fiction, whose objects are the events and its characters, but a *secondary* fiction, whose heroes are the narrator and the reader. So, the presence of a second person pronoun makes sense: the narrator directly refers to his reader, and the reference resolution of the pronoun is of the same nature as the reference resolution in communication; the second person pronoun refers to the addressee of the act of communication. Fauconnier's (1984, 1985) theory of *Mental Space* has a similar interpretation; whereas the main fiction is the relation between events (the mental space of the narrated universe, or *univers raconté*), the secondary fiction, called the *path space* (*espace parcours*), is not time-based but space-based. So, the reference to the secondary fiction is the location of the point at which the narrator and the reader stand within the fiction. Here are some examples, accompanied by a comment from Fauconnier (Fauconnier 1984: 179; the English version, Fauconnier 1985, does not contain the section IV.3 *Transferts temps-espace*):

(217) *Ici nous quittons Elvire pour revenir un peu en arrière.*
here we leave-PR Elvire to come back a little back
'Here we leave Elvire to go back a little bit.'

(218) *Max leva son poignard; ici les choses se gâtèrent et . . .*
Max raise-PS his dagger here things rot-PS and
'Max raised his dagger; here things went wrong.'

> [217] is located in the path space: flash back from the point reached; *here* denotes this point deictically and identifies it, quite regularly. [218], in contrast, is located in the (narrated) universe space and *here* does not identify a place in this universe, but one of its moments; indeed, being deictic, it is relative to the route space; it designates in this space the point where we are and by virtue of the principle of identification; it identifies the correspondent of this point at a moment of the narrated universe.[4]

This is made shown in Figure 12:

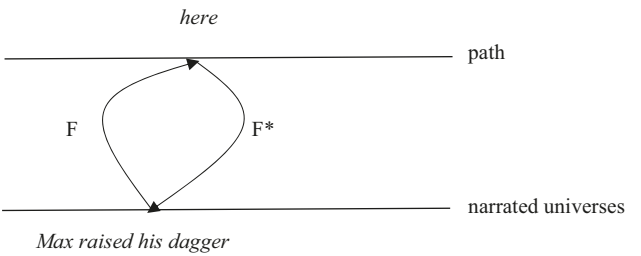

Figure 12: Connection between temporal and spatial mental spaces in Mental Space theory, where *F* is the connector from event to space and *F** the reverse connector.

Apart from the exceptional use of a second person pronoun, Banfield's principal claim – that narration is incompatible with discourse – can be maintained. Her definition of discourse is the following (Banfield 1982: 144):

Definition of discourse
An E of discourse is an E associated with both SPEAKER and ADDRESSEE/HEARER and with a PRESENT.
(Where E stands for Expression, a non-recursive node dominating a sentence node S.)

Thus, the non-communicative definition of narration implies that sentences containing a second person pronoun, a vocative, an addressee-oriented adverbial, an imperative, or any indication of pronunciation belong to discourse.

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4 "[217] se situe dans l'espace parcours: retour en arrière à partir du point atteint; *ici* désigne déictiquement ce point et l'identifie, de façon tout à fait régulière. [218] au contraire se site dans l'espace univers (raconté) et *ici* n'identifie pas un lieu de cet univers, mais un de ses moments: en effet, étant déictique, il est relatif à l'espace parcours: il désigne dans cet espace le point où nous sommes et en vertu du principe d'identification, il identifie le correspondant de ce point à un moment de l'univers raconté."

What are the features of narration? The primary feature implies properties of narrative tenses; in French, one of the most obvious features is the presence of the Passé Simple, "an exclusively narrative form" (Banfield 1982: 146). This tense is thus incompatible with a second person pronoun, a subjective noun or an illocutionary adverbial:

(219) *Il {*vous, me} parla de façon désagréable (*n'est-ce pas?)*
he {you, me} speak-PS in manner unpleasant (NEG is it NEG)
'He spoke to {you, me} in an unpleasant manner, didn't he?'

(220) *Il téléphona, (*chérie).*
he phone-PS (darling)
'He phoned, (darling).'

(221) ? *Franchement, il parla de façon désagréable.*
frankly he speak- PS in manner unpleasant
'Frankly, he spoke in an unpleasant manner'.

Second, the aorist is incompatible with NOW, whatever its linguistic realization (*maintenant, ce matin, aujourd'hui*) (222–224), as well as with a spatial deictic (225):

(222) *A Jules Verne, trop pondéré, je préférai (*maintenant)*
to Jules Verne too sensible I prefer-PS now
les extravagances de Paul d'Ivoi.
the extravagances of Paul d'Ivoi
'To Jules Verne, too sensible, I preferred (*now) the extravagances of Paul d'Ivoi'.

(223) *Je tombai (*ce matin) au dernier rang.*
I drop- PS this morning to the lowest rank
'I dropped (*this morning) to the lowest rank.

(224) *Nous retraversâmes (*aujourd'hui) l'avenue Gabriel.*
We cross again -PS today the Avenue Gabriel
'We made our way back (*today) along the Avenue Gabriel.'

(225) *Ils arrivèrent {*ici, à Paris} à huit heures.*
they arrive- PS HERE at Paris at eight hours
'They arrived {here, in Paris}at eight o'clock.'

However, spatial deictics like *here* have been shown to be compatible with the French Passé Simple (218). Temporal deictics are also counterexamples, as in a famous example found by Vuillaume (1990: 9):

(226) *Mathilde avait de l'humeur contre le jardin, ou du moins il lui semblait parfaitement ennuyeux: il était souvenir au souvenir de Julien.*
Le Malheur diminue l'esprit. Notre héros eut la gaucherie de s'arrêter auprès de cette petite chaise de paille, qui jadis avait été le témoin de triomphes si brillants. Aujourd'hui personne ne lui adressa la parole; sa présence était comme inaperçue et pire encore.
(Stendhal, *Le Rouge et le Noir*, Paris, Gallimard, 1972, 420–421)
'Mathilde was ill disposed to the garden, or at least it left her totally indifferent: it was connected to memories of Julien.
Misery weakens the mind. Our hero was awkward enough to stand close to the little straw chair, which had once witnessed such brilliant victories. No one said a word to him, today; his presence was imperceptible – or worse.'
(Stendhal, *The Red and the Black*, translation by Diane Johnson, New York, The Modern Library, 2004)

How can *aujourd'hui* 'today' be compatible with the Passé Simple? Here, there is no potential reference to a secondary fiction, nor to a different spatial mental space. There seems to be something which is similar to Free Indirect Discourser but with a true narrative tense.

In summary, narration excludes the second person pronoun, the Present, HERE and NOW; narration does not have features like PRESENT and ADDRESSEE/HEARER. However, there are examples, described in Hamburger (1957, 1973) like the *epic preterit*. This tense is defined semantically in terms of a "change in meaning", where the "preterit loses its grammatical function of designating what is past". Here are two examples in German from Hamburger (from Banfield 1982: 155):

(227) *Aber am Vormittag hatte sie den Baum zu putzen.*
But in the afternoon have-PRE she the tree to clean
Morgen war Weihnachten.
tomorrow be- PRE Christmas

'But in the morning she had to trim the tree. Tomorrow was Christmas.'
(Brend, *Die Bräutigame der Babette Bomberling*)

(228) *Unter ihren* *Lidern* *sah sie* *noch heute* *die Miene* *vor*
under her lids see-PRE she still today the expression before
sich. . .
her
'Still today, when she closed her eyes, she saw before her the expression on his face.'
(Thomas Mann, *Lotte in Weimar*)

Unlike the aorist, the epic preterit implies HERE, NOW and SELF, making these examples cases of Free Indirect Discourse For Banfield, FID is described using two main principles, explaining the use of a third person as the subject of consciousness (SELF) and the compatibility of past tenses with NOW (PRESENT). There two principles are called 1E/1 SELF and 1E/1 NOW:

1 E / 1 SELF: For every node E, there is at most one referent, called the 'subject of consciousness' or SELF, to whom all expressive elements are attributed.

Priority of SPEAKER: If there is an I, I is coreferential with the SELF. In the absence of an I, a third person pronoun may be interpreted as SELF.
(Banfield 1982: 93)

1 E / 1 NOW: All instances of NOW within a single E are cotemporal.
Priority of PRESENT: If there is a PRESENT, NOW is cotemporal with PRESENT. In the absence of a PRESENT, NOW is cotemporal with PAST.
(Banfield 1982: 99)

These principles explain how a third person pronoun can be interpreted as a subjective point of view (SELF) and *now* compatible with a past reference. So, Banfield's analysis connects syntactic properties and pragmatic principles. It contrasts with the strongly semantic analysis represented in Schlenker (2004), where the properties of FID are explained by way of a split in the context of *speech*, between the context of *utterance* and the context of *thought*. In FID, as well as in the Historical Present examples, tenses and pronouns are interpreted in relation to the context of utterance, explaining the preservation of third person pronouns and past tenses. Indexicals, however, are interpreted in the context of thought, which explains the indexical shift from the context of speech to the context of thought: the indexical *now*

is shifted into the context of thought, which is why the represented thought or speech corresponds to what the third person thinks or says.

At this point, an interesting connection arises with a property of a particular verbal tense, defined by default as deictic: the Present tense. Such an interpretation requires that the PRESENT feature be combined with the NOW feature, as in Schlenker's example of the Historical Present:

(229) Fifty-eight years ago to this day, on January 22, 1944, just as the Americans are about to invade Europe, the Germans attack Vercors.

The event *the Germans attack Vercors* is past, since it is located fifty years before the speech point *S,* and *on 22 January 1944*, which allows the hearer to compute that *S* is the 22 January 1994. Schlenker explains the fact that the present tense is not cotemporal with *S* by shifting the context of thought back to 22 January 1944, whereas for Banfield, the PRESENT feature is dissociated from NOW. In contrast, in the epic preterit – and its equivalent in French, the Imparfait – NOW is defined without a PRESENT feature, due to the clause "In the absence of a PRESENT, NOW is cotemporal with PAST" (Banfield 1982: 99). Finally, with the aorist and the Passé Simple in narration, there is no trace of PRESENT or NOW. This interaction of NOW and PRESENT gives rise to the four possible situations given in Table 25:

Table 25: NOW and PRESENT in tenses.

	+PRESENT	**–PRESENT**
+NOW	Present tense in discourse	epic Preterit and Imparfait in FID
–NOW	Historical Present	narrative Passé Simple

This in turn raises the following question: how can narration be described? Banfield's definition is as follows (Banfield 1982: 171):

Narration
An E of narration is one which may or may not contain a SPEAKER, but which has no ADDRESSEE/HEARER, no PRESENT, and no HERE or NOW.

The main property is the absence of a second person. This not only implies that narration is not discourse, but that narration is not communication. As such, there are only two possibilities for the use of pronouns in narration: narratives may be in the third person, or in the first person. In the first case, Banfield adopts the classic analysis by Benveniste (1966: 241): "In fact, there is then no longer

even a narrator. The events are set forth chronologically, as they occurred. No one speaks here; the events narrate themselves" (my translation).[5] So, there is no speaker, no addressee and no communication, explaining why narration is disconnected from communication. As for narration is in the first person, there is a narrator (Genette 1972), but nobody talks: "[. . .] in first person narration, there is a narrator. Nevertheless, one can still say that in narration no one speaks, for the speech act requires an interlocutor as well" (Banfield 1982: 164). In the famous example of Proust's *À la recherche du temps perdu* ('The Remembrance of Things Past'), there is a narrator, Marcel, but no addressee, and thus no communication in the full sense. This can be seen in the contrast between (230) and (231):

(230) *Que vis- je?* (Proust)
What see-PS I
'What did I see?'

(231) * *Que vis- je aujourd'hui?*
What see- PS I today
'What did I see today?'

So, if there is no addressee or hearer in narration, there should be another type of sentence in which, without any speaker or hearer, a subjective perspective is available. Such sentences are FID sentences, with no speaker and no addressee, but with a subject of consciousness. "It is the sentence of narration which lays bare the narrative function, just as the represented E unmasks and distances the expressive function [. . .]" (Banfield 1982: 165). These sentences are what Banfield calls *unspeakable sentences*.

There seem to be certain exceptions to this: whereas in classic examples of narration in the first person (*David Copperfield*, *À la recherché du temps perdu*) there is no addressee, there are cases of "literary first person narrative which clearly has a second person" (Banfield 1982: 172). Following Russian formalists, Banfield calls this case *skaz*, meaning 'speech'. In skaz, "the fictional storyteller or letter writer addresses the tale to some audience, whose presence is linguistically reflected in the tale itself" (Banfield 1982: 172). Examples of skaz are Alphonse's Daudet's *Les Lettres de mon moulin* in French, and Mark Twain's *The Celebrated Jumping Frog* or *Huckleberry Finn* in English.

5 "A vrai dire, il n'y a même plus alors de narrateur. Les événements sont posés comme ils se sont produits à mesure qu'ils apparaissent à l'horizon de l'histoire. Personne ne parle ici: les événements semblent se raconter d'eux-mêmes".

6 Conclusion

This chapter has provided a more precise picture of the relation between *tenses*, *time* and *narration*, revealing interesting correlations between tenses and pronouns, specifically in narration and Free Indirect Discourse Certain particular uses of pronouns and tenses have been rigorously accounted for, at least in some syntactic and semantic frameworks such as those of Banfield and Schlenker (see Reboul, Delfitto, and Fiorin 2016 for a precise picture of semantic approaches to FID). But we also know that there is a precise correlation between tenses and a specific discourse phenomenon called *temporal order*; this seems to be specific to narration, but not to tenses. The next chapter will show that the French Historical Present is used as a narrative tense. There are also examples of cases of non-narrative tenses, like the French Passé Composé, which is by default non-directional (with its semantics connected to S, which is to say E—R, S). One of the most famous novels written mostly in the Passé Composé is *L'Étranger* ('The Stranger') by Albert Camus, where the English translation uses the Preterit:

(232) J'ai couru pour ne pas manquer le départ. Cette hâte, cette course, c'est à cause de tout cela sans doute, ajouté aux cahots, à l'odeur d'essence, à la réverbération de la route et du ciel, que je me suis assoupi. J'ai dormi pendant presque tout le trajet. Et quand je me suis réveillé, j'étais tassé contre un militaire qui m'a souri et qui m'a demandé si je venais de loin. J'ai dit « oui » pour n'avoir plus à parler.
(Albert Camus, *L'Étranger*, Paris, Gallimard, 1957, 8–9)
'I had to run to catch the bus. I suppose it was my hurrying like that, what with the glare off the road and from the sky, the reek of gasoline, and the jolts, that made me feel so drowsy. Anyhow, I slept most of the way. When I woke I was leaning against a soldier; he grinned and asked me if I'd come from a long way off, and I just nodded, to cut things short. I wasn't in a mood for talking.'
(Albert Camus, *The Stranger*, translated from French by Stuart Gilbert, New York, Vintage Books, 4)

This narrative use of the French Passé Composé allows the next chapter to address the semantics of tenses in a simpler way. Not only is it clear that tenses expressing past time are used in narration, but they also behave differently in FID and the Historical Present. Making such different uses (standard imperfective past and present for the French Imparfait and Présent respectively) compatible with their use in FID and the Historical Present will thus present a real

challenge; temporal order will act as our guide in the search for a general procedural approach to tenses. The solution will have to address the issue of the semantics-pragmatics interface in a very clear way. The semantics for tenses will be restricted to a Reichenbachian semantics, and their pragmatics to features like [±narrative] and [±subjective].

4 Directional inferences: A conceptual/procedural approach to tenses

1 Introduction

Chapter 3 introduced the concept of *temporal order*, which seems to be one of the main properties of the use of tenses in discourse; it discarded semantic approaches (discourse semantics, compositional semantics) and argued instead for a pragmatic approach. However, none of the discussed pragmatic approaches seemed to meet descriptive adequacy. Gricean pragmatics can be ruled out, as temporal order is not the result of a conversational implicature when the temporal use of *and* is concerned. But while the argument for an explicature analysis of temporal order is beyond convincing, it raises at least two questions. The first of these is the contribution of tenses to explicatures. The second regards the analysis of *and*: how can a pragmatic and procedural analysis of tenses account for temporal order and make it compatible with the semantics and pragmatics of *and*? The second issue will be extensively developed in Chapter 6 with a contrastive analysis of other causal connectives, based on the idea that solving the causality issue in discourse solves the temporal order issue (following Wilson and Sperber 2012: chapter 8). As for the contribution of tenses to explicatures, it is a serious descriptive and theoretical challenge. An analogy with pronominal reference can help, but only partially: if tenses were described as temporal variables, as pronouns are supposed to behave semantically (Heim and Kratzer 1998), then the issue of explicature would be reduced to the saturation of temporal variables. However, as shown in Chapter 3, tenses cannot be reduced to variables, mainly because at least three variables are required to describe tenses, and because temporal order – even though it implies a shift in reference points – cannot be explained only in these terms, as the description of a phenomenon is not equal to its explanation.

So, there are two main challenges. The first is to explain the relation between the semantics of tenses and temporal order. Are tenses specialized in temporal relations? The discussion of discourse semantics approaches to temporal order provides us with the initial indication that there is no linguistic command in terms of tenses and temporal order; the main issue is thus what type of information is linguistically encoded in tenses. The second challenge is to obtain a descriptively adequate semantics of tenses which can account for their contribution to temporal order. As argued in section 5 of Chapter 3, temporal order is a property of narration; the relevance of a temporal order interpretation is not restricted, but favoured in narration, mainly because narration is about the relations between events. For

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this reason, this chapter will begin with a pragmatic formulation of the issue of temporal order.

Section 2 will then propose a pragmatic (that is, inferential) approach to temporal order. This model is based on the notion of directional inference, a pragmatic inference whose output is time direction. It will be argued that *directional* inferences are the results of compositional treatment implying lexical semantics and the semantics of tenses, as well as contextual assumptions about the acceptable and possible temporal relations in the world. The narrowing of the directional inference issue to properties of contexts aims to explain why discourse semantics is unable to solve the temporal order issue. However, some limits of this model will be discussed, pertaining to the poor description of verbal tenses.

In section 3, I will present a general model for tenses, which will mix conceptual and procedural information on the one hand, and the semantic and pragmatic properties of tenses on the other. The main hypothesis of the mixed conceptual-procedural model (MCPM) is that the semantics of tense is restricted to conceptual information concerning the relation between *E* and *S* – that is, concepts like PAST, PRESENT or FUTURE. Pragmatic information, on the other hand, is mainly procedural, like the relation between R and E, which is expressed in pragmatic temporal features such as NARRATIVE.

Section 4 will test this model by discussing the issue of the Historical Present (HP) in French. This discussion will be crucial, because HP is characterized by a semantic shift in temporal reference (the reference of tensed sentences is not PRESENT but PAST). One of the principal features of the HP is the combination of +NARRATIVE and +SUBJECTIVE features; what makes the HP really relevant is that narration is interwoven with subjectivity, whereas narration in the Passé Simple is generally without a subjective perspective. This will be contrasted, in section 5, with the role of other past tenses like the French Imparfait in Free Indirect Discourse (FID). In FID, no temporal order is at stake, and the use of an imperfective tense makes access to a subjective perspective possible.

2 The model of directional inference (MDI)

2.1 Background assumptions

The idea of the model of directional inferences (MDI) is based on two simple assumptions (Moeschler 2000a, 2000b, 2000c, 2000d, 2002a, 2005): (i) temporal inferences are directional; (ii) directional inferences are by-products of compositional meaning and contextual information. What is striking with temporal inference is that, in some cases, it is a strict discourse process, as in (233); in other

cases, temporal inferences are favoured by non-lexical encoded information, like tenses and connectives (234). Finally, they can be dependent on strict lexical (that is, conceptual) information, as in (235):

(233) a. *John fell into a precipice. He broke his leg.*
b. *John broke his leg. He fell into a precipice.*

(234) a. *John fell into a precipice because he had broken his leg.*
b. *John broke his leg because he had fallen into a precipice.*

(235) a. *Mary pushed John. He fell.*
b. *John fell. Mary pushed John.*

In (233), there is a preference for a forward or a narrative interpretation in both (a) and (b), mainly because both temporal and causal relations are contextually acceptable. For instance, if the speaker is talking about what happened to John while he was skiing, then two situations are possible: first, John fell into the precipice while skiing and, as a consequence, broke his leg; second, John broke his leg while skiing and, as a consequence of his off-piste skiing, fell into the precipice. In other words, both the forward and backward interpretations are contextual: nothing in the conceptual relation – nor in the tenses – allows for one interpretation or the other. The first point is important, because it is implausible that there might be a semantic and non-defeasible conceptual relation between falling and breaking one's leg; the rules in (236) are implausible mainly because they are easily defeasible, as in (237).

(236) a. FALL (x) → BREAK_LEG (x)
b. BREAK_LEG (x) → FALL (x)

(237) a. *John fell into a precipice but did not break his leg.*
b. *John broke his leg, but he did not fall into a precipice.*

In (234a) and (234b), the interpretation is univocal: the only interpretation is backward. These interpretations are commanded by the connective *because* as well as the Past Perfect tense, giving the accessible interpretation in (238):

(238) a. *John broke his leg* CAUSES *John fell into a precipice.*
b. *John fell into a precipice* CAUSES *John broke his leg.*

Finally, the forward reading is preferred over the backward one in (235a), with the reverse interpretation in (235b); the PUSH-FALL reading is forward in (a) and backward in (b), whereas the FALL-PUSH reading is unacceptable in both (a) and (b). However, in (239), it is exactly the other way around, and the FALL-PUSH reading holds:

(239) a. *Mary pushed John. He had fallen.*
b. *John had fallen. Mary pushed John.*

Why should it be that (235) is univocal? This chapter will argue that there is a motivated PUSH-FALL conceptual rule, like (240), which is based not on linguistic meaning but on world knowledge. As such, this rule is defeasible (241), which means that it is not part of the logical entry of the concept FALL nor of the concept PUSH, but stored in the encyclopaedic entry of these concepts:

(240) PUSH (x, y) → FALL (y)

(241) a. *Mary pushed John but he did not fall.*
b. *John fell, but it was not because Mary pushed him.*

So, the concept PUSH receives the following description:

(242) concept PUSH

a. Lexical entry	*push*
b. Logical entry	PUSH (x, y) → CONTACT (x, y)
c. Encyclopaedic entry	PUSH (x, y) → FALL (y)

This description strongly contrasts with true semantic rules, as the KILL-DEAD conceptual rule, which belongs to the logical entry of the concept KILL (243). This is proved by its non-defeasible property, as shown in (244):

(243) KILL (x, y) → DEAD (y)

(244) # *John killed the president, but he did not die.*

So, the following semantic and pragmatic layers play a role in inferring temporal order: (i) conceptual rules, (ii) tenses and connectives and (iii) contextual information.

2.2 Three main assumptions

In terms of the relation between these layers of information, the MDI makes the following assumptions (Moeschler 2000c):

A. Contextual information is stronger than linguistic information.
B. Procedural information is stronger than conceptual information.
C. Propositional procedural information is stronger than morphological procedural information.

These three principles are represented in Figure 13:

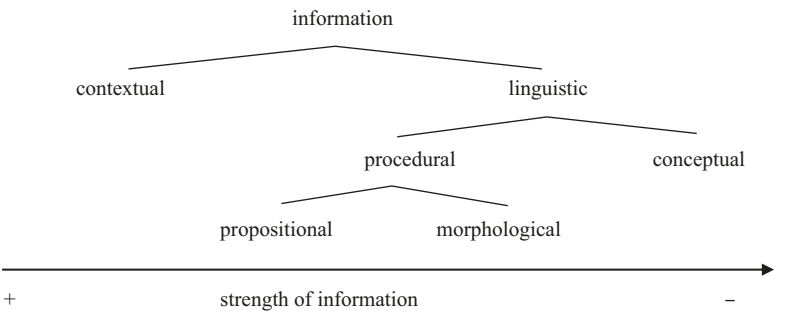

Figure 13: Hierarchy of linguistic and non-linguistic information (Moeschler 2000c).

Turning to the predictions made by these assumptions, the best empirical confirmation is to use a neutral directional tense, a good candidate for which is the French Passé Composé. (245) can receive a forward or backward interpretation, as can (246):

(245) *Max est tombé dans un précipice. Il s' est cassé la jambe.*
Max is fallen in a precipice he himself is broken the leg
'Max fell into a precipice. He broke his leg.'

(246) *Max s' est cassé la jambe. Il est tombé dans un précipice.*
Max himself is broken the leg he is fallen in a precipice
'Max broke his leg. He fell into a precipice.

So how is the inferential process of temporal order possible? Given that contextual information is stronger than linguistic information, it should trigger an inferential process. This process must be (following Sperber and Wilson [1986] 1995)

deductive: from a contextual assumption and a premise flowing from an utterance, the conclusion provides the temporal information. In the *forward* reading, the inferential process of (245) is given in (247), and the temporal inference in (248):

(247) a. If Max falls into a precipice, he breaks his leg.
b. Max fell into a precipice.
c. Max broke his leg.

(248) Max fell into a precipice THEN Max broke his leg.

As for the *backward* reading of (245), the inferential process is given in (249) and the backward temporal inference in (250):

(249) a. If Max breaks his leg, he falls into a precipice.
b. Max broke his leg.
c. Max fell into a precipice.

(250) Max broke his leg THEN Max fell into a precipice.

Assumption B is certainly the MDI's most substantial claim because it forms a hierarchy of conceptual and procedural information. Taking the example of the French Passé Simple, what is relevant is that tenses rule out the conceptual rule PUSH-FALL; whatever the motivation for such a rule, it is weaker than the information encoded in tenses. Indeed, there seems to be a temporal implicature, which can be cancelled as in (253) and (254):

(251) *Marie poussa Jean. Il tomba.*
Mary push-PS John he fall-PS
'Mary pushed John. He fell.'

(252) *Jean tomba. Marie le poussa.*
John fall-PS Mary him push-PS
'John fell. Mary pushed him.'

(253) *Marie poussa Jean. Il tomba.*
Mary push-PS John he fall- PS
Mais personne ne sait dans quel ordre cela s'est passé.
but no-one NEG know in which order that it has happened
'Mary pushed John. He fell. But no-one knows in which order it happened.'

(254) *Jean tomba. Marie le poussa.*
John fall-PS Mary him push-PS
Mais personne ne sait dans quel ordre cela s'est passé.
but no-one NEG know in which order that it has happened
'John fell. Mary pushed him. But no-one knows in which order it happened.'

With the Plus-Que-Parfait, the backward reading is the case, but it is not cancellable, as is the forward reading with the Passé Simple:

(255) *Jean tomba. Marie l'avait poussé.*
John fall-PS Mary him had pushed
'John fell. Mary had pushed him.'

(256) *Marie poussa Jean. Il était tombé.*
Mary push-PS John he had fallen
'Mary pushed John. He had fallen.'

(257) *Jean tomba. Marie l'avait poussé.*
John fall-PS Mary him had pushed
 # Mais personne ne sait dans quel ordre cela s'est passé.
but no-one NEG know in which order that it has happened
'John fell. Mary had pushed him. But no-one knows in which order it happened.'

(258) *Marie poussa Jean. Il était tombé.*
Mary push-PS John he had fallen
 # Mais personne ne sait dans quel ordre cela s'est passé.
but no-one NEG know in which order that it has happened
'Mary pushed John. He had fallen. But no-one knows in which order it happened.'

Assumption C makes a new prediction about the scope of the procedural marker. It is assumed that connectives are stronger than tenses, the reason being a question of scope: the scope of connectives is propositional, whereas the scope of tenses is only predicative, as they modify the event and not the entire proposition. This assumption is not obvious, because compositional semantics attributes a propositional scope to tenses (see Chapter 3). However, this analysis is compatible with a neo-Davidsonian approach, since tense semantics is located in a propositional function, such as [Culminated(*e*, before now)].

So, what is the relation between connectives and tenses? I will examine both forward and backward inferences, using the connective *and* and the Passé Simple (forward), and the connective *because* and the Plus-Que-Parfait (backward). Here are the data, some convergent, others divergent:

(259) *Marie poussa Jean et il tomba*.
Mary push-PS John and he fall-PS
'Mary pushed John and he fell'.

(260) *Jean tomba parce que Marie l'avait poussé*.
John fall-PS because Mary him had pushed
'John fell because Mary had pushed him'.

In (259), the Passé Simple and *et* 'and' match one another because they both imply a forward relation, which is made explicit in (261). In (260), the backward reading converges with *parce que* 'because' and the Plus-Que-Parfait, implying a non-iconic order (see Chapter 5 on causality and Chapter 6 on causal connectives), which gives rise to a more specific, i.e. causal reading (262):

(261) Marie pushed John THEN John fell.

(262) Marie pushed John CAUSE John fell.

However, in (263), there is a mismatch between the forward orientation of *tomba* 'fell' and the backward orientation of *parce que* 'because'. This is reversed in (264), where the Plus-Que-Parfait tense has backward orientation and the connective *et* 'and' forward orientation. The mismatches are indicated by '#'.

(263) # *Marie poussa Jean, parce qu'il tomba*.
Mary push-PS John because he fall-PS
'Mary pushed John because he fell'.

(264) # *Jean tomba, et Marie l' avait poussé*.
John fall- PS and Mary him had pushed
'John fell, and Mary had pushed him.'

However, the reasons for these mismatches are not the same. (263) can receive a backward reading if interpreted as a FALL-PUSH relation, and the Passé Simple *tomba* is an underspecified formulation compared to the explicit formulation using the Plus-Que-Parfait. Another possible interpretation has a forward

reading, implying an epistemic *parce que* (Sweetser 1990). This is given in (265), and requires a comma between the two clauses:

(265) Mary pushed John, and the reason why I believe this is that John fell.

In (264), the situation is different; there is a kind of back-and-forth movement in the representation of events. The issue is more relevance than mismatch: why go forward first (due to the Passé Simple) and then backward (due to the Plus-Que-Parfait), as in Figure 14?

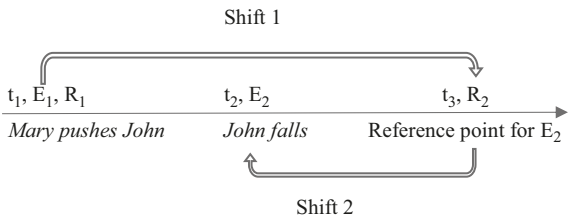

Figure 14: Temporal interpretation for (264).

Just as the Plus-Que-Parfait requires, the point of the event is represented from a reference point (R_2) posterior to the event point (E_2). This shift is strange, because in the standard uses of the Plus-Que-Parfait the reference point is provided by a sentence in the Passé Simple. However, in (264), this event (E_1) is anterior to E_2, and the Passé connective *et* 'and' requires a shift from R_1 to R_2 posterior to E_2 (shift 1). To arrive at the correct interpretation, the hearer has to move from R_2 to E_2, because of the Plus-Que-Parfait (shift 2). This is quite a difficult transition, as it does not correspond to any ordinary transitions in temporal interpretation.

2.3 Directional features

These findings raise a difficult question: how is it possible to express the difference between four degrees of strength in the triggers for directional inference? The MDI proposes:

- Conceptual information and tenses encode weak features, whereas connectives and contextual assumptions encode strong features.
- Tenses defeat conceptual information, and contextual assumptions defeat connectives.

– The relationship between features is governed by assumptions D and E:

D. A strong feature dominates a weak feature or a string of weak features.

E. A weak feature or a string of weak features must be licenced by a strong feature.

Table 26 gives the hierarchy of features:

Table 26: A hierarchy of directional features.

contextual assumptions		strong feature
procedural propositional information	connectives	strong feature
procedural morphological information	tenses	weak feature
conceptual information	predicates	weak feature

One of the primary consequences of assigning directional features to conceptual and procedural information is that various types of expressions encode directional features, which are non-defeasible. The idea here is that non-defeasible features can be active without being dependent on either (i) the presence of a strong feature confirming a weak feature, or (ii) the need for confirmation from strong contextual features. For instance, in a classic example like (251) – *Marie poussa Jean. Il tomba* 'Mary pushed John. He fell' – the directional inference triggered on the basis of tenses and conceptual information must be confirmed by a contextual strong feature; certain contextual assumptions must be accessible and confirm the linguistic encoded directional features. This is crucial, as there is no default interpretation in the MDI, nor a circumstantial context rescue; the approach is both contextual and linguistic.

Nevertheless, two crucial points must still be answered: which types of features are assigned to which types of expressions? And secondly, how can directional inferences be computed from directional features? The chart in Table 27 gives the notation for four types of directional features, and Table 28 provides an answer to the first question:

Table 27: Types of directional features.

features	**forward**	**backward**
weak	b	b
strong	F	B

Table 28: Directional features and linguistic expressions.

expressions	directional features	notations
Passé Simple	f	f_{PS}
Plus-que-Parfait	b	b_{PQP}
***et* 'and'**	F	F_{ET}
***parce que* 'because'**	B	B_{PQ}
pousser (. . . ***tomber)* 'push** . . . **fall'**	f	f_{push}
tomber (. . . ***pousser)* 'fall** . . . **push'**	b	b_{push}

It is worth noting that French tenses that do not trigger directional inferences are not indexed as carrying directional features. This explains why the French Passé Composé is neutral for directional inference and does not bear any information on time direction. This is also true of the French Imparfait; if the Imparfait has a narrative use (Narrative Imparfait), then the narrative effect is caused by other information, like the temporal adverbial in (266).[1]

(266) *Marie entra dans la voiture 10. Cinq minutes plus tard,*
Mary enter-PS in the coach 10. Five minutes more late
le train déraillait.
the train derail-IMP
'Mary entered the coach 10. Five minutes later, the train derailed.'

In (266), the shift in reference time is triggered by the adverbial *cinq minutes plus tard* 'five minutes later'. In that case, the Imparfait does not play any role in the temporal inference.

So how is the computation of a directional inference organized? The algorithm is the following (Moeschler 2000c):

1. Assign to the first utterance U_1 a directional feature computed on the basis of the directional features carried by linguistic expressions;
2. Construct, if available, a contextual assumption based on the conceptual expression;
3. Assign to the second utterance U_2 a directional feature computed on the basis of the directional features carried by the linguistic expression, if any;
4. Compute the directional inference of discourse $[U_1\text{-}U_2]$;
5. License the directional inference by an accessible contextual assumption;
6. Start the process again for any new utterance U_i.

1 This is the same analysis as Dowty's (1986).

Such a process is obtained for (267) as follows:

(267) *Jean tomba parce que Marie l' avait poussé.*
John fall-PS because Mary him had pushed
'John fell because Mary had pushed him.'

1. U_1: *tomba* = f_{PS},
   U_1: f_{U1}
2. no contextual assumption is available from *tomba* 'fell'
3. U_2: *parce que* = B_{PQ}
   avait V-é = b_{PQP}
   poussé = b_{push}
   U2: $B_{PQ} \wedge b_{PQP} \wedge b_{push} = B_{U2}$
4. [U1-U2] $f_{U1} \wedge B_{U2} = B_{U1\text{-}U2}$
5. a. Accessible contextual assumption: if Mary pushed John, then John fell afterwards
   b. Licencing $B_{U1\text{-}U2}$

The recursive process of assigning a directional feature to any following utterance is illustrated in (268):

(268) *Jean tomba parce que Marie l' avait poussé. Il se releva les genoux en sang.*
John fall- PS because Mary him had pushed he himself get-PS up the knees in blood
'John fell because Mary had pushed him. He got up, his knees bloodied.'

Figure 15 is a hierarchical representation of the construction of directional inferences.

2.4 Three shortcuts

As such, this model makes significant predictions about directional inferences in discourse. The advantage of the MDI is that it is compatible with the intuitions we might have about narrative discourse. Nevertheless, a number of matters must still be discussed, the first of which is *incrementation* in discourse. Discourse is incremental; thus, the addition of a new utterance is not rule-governed, but governed by pragmatic principles monitoring information and relevance. For instance, compare the dialogues in (269) and (270):

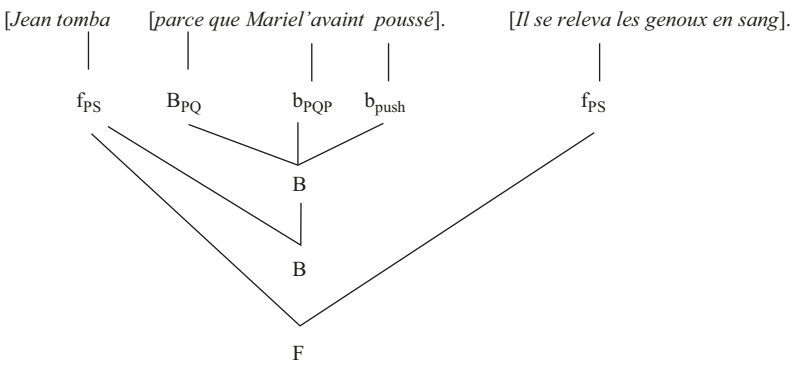

Figure 15: Computation of directional inference for (35).

(269) Peter *Are you going to the Pragmatics class?*
Mary *I have an appointment with my doctor.*

(270) Peter *Are you going to the Pragmatics class?*
Mary *No.*
Peter *Why?*
Mary *I have an appointment with my doctor.*

(269) is not a direct answer but provides the relevant information – the reason why Mary will not attend the pragmatics class. So, the discourse is not expanded, contrary to (270), because the speaker chooses to provide as much information as required (quantity, Grice) and information that produces greater cognitive effects than the cognitive costs paid (relevance, Sperber and Wilson). For narratives, what is relevant is the information allowing for a global – rather than merely local – interpretation. Consider a simple but somewhat wonderful example from the XIXth century French writer Stendhal.

(271) *Oserai-je raconter l'anecdote que l'on m'a confiée en prenant le frais à l'ombre du mur d'un cimetière dans une pièce de luzerne à la verdeur charmante? Pourquoi pas? Je suis déjà déshonoré comme disant des vérités qui choquent la mode de 1838:*
Le curé n'était point vieux; la servante était jolie; on jasait, ce qui n'empêchait point un jeune homme du village voisin de faire la cour à la servante. Un jour, il cache les pincettes de la cuisine dans le lit de la servante. Quand il revint huit jours après, la servante lui dit: "Allons, dites-moi où vous avez mis les pincettes que j'ai cherchées partout depuis votre

> *départ. C'est là une bien mauvaise plaisanterie." L'amant l'embrassa, les larmes aux yeux, et s'éloigna*. (Stendhal, *Voyage dans le midi*, Divan, 115)
> 'Dare I tell the anecdote related to me while I was sheltering from the heat in the shadow of a cemetery wall among the charming green alfalfa? Why not? I am already notorious for telling truths which shocked the mindset of 1838: The curate wasn't old at all; the maid was pretty; but the gossip about them was not enough to stop a young man from the neighbouring village courting the maid. One day, he hid the kitchen tongs in the maid's bed. When he came back eight days later, the maid said to him: "Come on then, tell me where you've put the tongs I've been looking for everywhere since you left. The joke's gone on long enough." Her lover kissed her, teary-eyed, and left.'
> (translated by Alasdair Gunn)

This example shows exactly the same property of discourse illustrated by examples (269)-(270), albeit at a higher stylistic level. The discourse interpretation process requires the search for a global interpretation, defined in Reboul and Moeschler (1998) as a *global informative intention*. The assumption is that each utterance gives rise to a local informative intention, which is what the addressee must construct in order to access the speaker's informative intention. But this alone is not enough, because he must also construct a global informative assumption licensing the global informative intention, which is what the speaker/author wants to communicate. In (271), there are many cues for such a global interpretation: *des vérités qui choquent la mode de 1838* 'truths which shocked the mindset of 1838'*; Le curé n'était point vieux* 'The curate wasn't old at all'*; la servante était jolie* 'the maid was pretty'*; on jasait* 'the gossip about them'*; il cache les pincettes de la cuisine dans le lit de la servante* 'he hid the kitchen tongs in the maid's bed'*; dites-moi où vous avez mis les pincettes que j'ai cherchées partout depuis votre départ* 'tell me where you've put the tongs I've been looking for everywhere since you left'*; L'amant l'embrassa, les larmes aux yeux, et s'éloigna* 'Her lover kissed her, teary-eyed, and left'. The construction of such a global assumption is a process of assumption confirmation and confirmation, as described in Relevance Theory (Sperber and Wilson [1986] 1995: 201): "the calculation of implicatures is a matter of non-demonstrative inference. It involves a partly non-logical process of assumption formation and confirmation". These global assumptions are the following:

(272) Stendhal justifies his bad reputation by criticizing the clergy.

(273) Stendhal is telling that a priest is sleeping with his maidservant.

So (273) must be inferred as soon as possible, and the last utterance of (271) – *L'amant l'embrassa, les larmes aux yeux, et s'éloigna* 'Her lover kissed her, teary-eyed, and left' – is its confirmation; failing to construct this assumption is failing to gain access to Stendhal's global informative intention (Reboul and Moeschler 1998). So, the first drawback of the MDI is that it is more compositional than pragmatic, in the sense of discourse pragmatics (Moeschler 2010a; Reboul and Moeschler 1998).[2]

The second issue is the role of statives in directional inferences. The MDI has *forward* and *backward* directional inference as basic concepts; what does this mean for statives? In all narratives, stative eventualities (states and activities) play a crucial role in providing background information, as extensively argued by Weinrich (1964, 1973). For Weinrich, the classical opposition in French narration between the Passé Simple and the Imparfait is not an aspectual issue (Weinrich 1973: 112–117) but a highlighting one: where the Passé Simple is foregrounded, the Imparfait is backgrounded. The issue is then the role of such backgrounded utterances in narration. In ter Meulen's DAT model (Dynamic Aspectual Trees), temporal order depends on aspectual properties of sentences (filters and plugs, which is to say accomplishments and achievements), and states and activities behave like holes (ter Meulen 1995: 6–7; emphasis mine):

> In the traditional terminology of aspectual classes *holes* correspond to activities or processes, *descriptions of events that apply throughout their internal structure homogeneously* [. . .]. *Filters* correspond to accomplishments (also, confusingly, called "events" in the literature), which are descriptions of change that never apply to any part of an event they describe [. . .]. *Plugs* are special cases of filters, commonly called "achievements", which are in a conceptual sense instantaneous, since they do not consist of an initial and a final stage [. . .].
>
> If we interpret a given clause describing an event as a hole, then we interpret the information expressed in the next sentence of the text as describing of a temporal part of that event, as if the information it conveys flows through the hole. *The context created by representing an event as a hole incorporates new information as describing an event temporally included in the hole*.

A concrete example comes from the opening passage of *Airframe*, by Michael Crichton (the French translation of the English original is used because of the contrast in tenses):

2 By Discourse Pragmatics, I refer to the extension of a theory of utterance interpretation as Relevance Theory (Sperber and Wilson [1986] 1995) to discourse interpretation. In Reboul and Moeschler (1998), it is claimed that discourse comprehension is mainly a process governed by a process of global hypothesis confirmation, without requiring any specific discourse principles.

(274) *Emily Jansen poussa un soupir de soulagement (e_1). Le long vol approchait de son terme (e_2). Le soleil filtrait par les hublots de l'avion (e_3). Assise dans son giron ($e_{4'}$), la petite Sarah cligna les yeux dans cette lumière inhabituelle (e_4) tandis qu'elle aspirait bruyamment la fin de son biberon (e_5).*
'Emily Jansen sighted in relief (e_1). The long flight was nearing an end (e_2). Morning sunlight streamed through the windows of the airplane (e_3). In her lap ($e_{4'}$), little Sarah squinted in an unaccustomed brightness (e_4) as she noisily sucked the last of her bottle (e_5).'

Figure 16 is a representation of directional inferences, where horizontal arrows indicate relations between accomplishments/achievements (that is, forward directional inferences) and vertical arrows a filter/plug-hole relation (that is, a temporal inclusion relation, marked in French by the Imparfait):

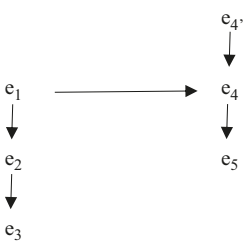

Figure 16: Temporal relations of the opening passage from Crichton's *Airframe*.

What Figure 18 shows is that e_2 and e_3 are holes, as they include e_1 and e_2 respectively, and $e_{4'}$ and e_5 both include e_4. This augmented MDI then has to explain how some tenses, like the French Imparfait and Passé Composé, are compatible with an inclusive temporal relation and with both forward and backward directional inferences. At this point, it should be clarified that relations such as those in Figure 18 require minimal pragmatic interpretation processes. Just like the global information assumption in (272)-(273), if they are not identified, they give rise to an incomplete interpretation, and are thus mandatory to arrive at the speaker's meaning.

The third possible objection to the MDI relates to the status of connectives, in particular causal and temporal connectives like *because* and *and*. These will be discussed extensively in Chapter 6, but their status as procedural markers must be discussed here. In the MDI, *et* 'and' and *parce que* 'because' are procedural markers carrying strong directional features (that is, a forward feature and a backward feature). This is not without its problems, mainly because the directional inference with *and* is defeasible, but not so with *because*:

(275) *At the department party, I got drunk and no-one talked to me, but I don't remember in which order it happened.*

(276) # *He came back because he loves her, but it is the other way around: he loves her because he came back.*

This is a serious issue: *because* has a non-defeasible causal meaning, whereas *and* has a defeasible temporal and causal one. In these conditions, why should they carry strong directional features – that is, encoded information about directional inferences? This is the most serious objection raised, and a significant alternative to the MID must be proposed. This will be extensively discussed in Chapter 6 on causal connectives, which will argue for a consistent description of connectives. The MDI also asserts that tenses encode both a conceptual and procedural meaning, as suggested in chapter 2, which is what I will now discuss.

3 A conceptual and procedural approach to tenses

Recent publications (Moeschler, Grisot, and Cartoni 2012; Grisot and Moeschler 2014; Grisot 2015, 2018a; Grisot, Cartoni, and Moeschler 2016) have argued for a mixed model of tenses. This model has been empirically tested on parallel corpora by means of inter-annotator agreement experiments. I will report here only the theoretical foundations (see Grisot 2018a for the empirical and experimental research).

In Moeschler (2013c), I discuss the results of a previous qualitative analysis of corpus data for the Historical Present (cf. section 4 for a more detailed discussed on the HP) which showed three main properties of verbal tenses which the MDI had not taken into account. Firstly, only some data exhibited the property of temporal order (forward directional inference); secondly, only some data expressed a subjective point of view; thirdly, only some data were explicitly subjective. Three main binary features were therefore at play: [±narrative], [±subjective] and the explicitness of subjectivity [±explicit]. When combined, these give rise to six possible pragmatic uses of a verbal tense.

In Moeschler, Grisot, and Cartoni (2012) we put forward a different model of verbal tenses, in which we suggested that the pragmatic usages given by the six combinations of these three binary features are anchored in the semantics of tenses. Furthermore, the semantic core of a tense is conceptual, whereas its pragmatic usages are procedural. Figure 17 gives the general architecture of the mixed model, and Table 29 represents the hierarchy of potential use for any

tense. Combining these two levels of information was the first step towards a new, richer theoretical model for the semantics and pragmatics of tenses.

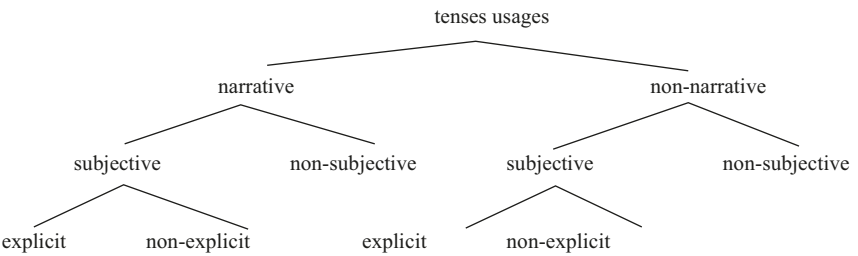

Figure 17: The pragmatic organization of tenses.

Table 29: Semantic and pragmatic layers of meanings.

layers	types of meaning	types of content
semantic	conceptual	S (speech point) R (reference point) E (event point)
pragmatic	procedural	± narrative ± subjective ± explicit

Examples (277) to (282) provide examples of each.

(277) [+narrative] [+subjective] [+explicit]
Demain, j'irai chez le coiffeur et me teindrai les cheveux.
tomorrow I go-FUT to the barber and me dye- FUT the hair
'Tomorrow I'll go to the barber and dye my hair.'

(278) [+narrative] [+subjective] [-explicit]
Marie sauta dans le train. Dix minutes plus tard, le train déraillait.
Mary jump-PS onto the train ten minutes later the train derail-IMP
'Mary jumped onto the train. Ten minutes later, the train derailed.'

(279) [+narrative] [–subjective]
Paul entra dans un café et commanda une bière.
Paul enter- PS in a coffee shop and order- PS a beer
'Paul entered a coffee shop and ordered a beer.'

(280) [–narrative] [+subjective] [+explicit]
Qu' elle était stupide, pensa-t-elle.
That she be-IMP stupid, think- PS she
'How stupid she was, she thought.'

(281) [–narrative] [+subjective] [–explicit]
En 1805 Napoléon se déclarait empereur.
in 1805 Napoleon himself declare- IMP emperor
'In 1805, Napoleon declared himself emperor.'

(282) [–narrative] [–subjective]
Un père tue sa famille et se suicide.
a father kill-PR his family and himself suicide
'A father kills his family and commits suicide.'

As argued in Chapter 3, the location of the event relative to S, R and E is the semantics of tenses (following Reichenbach 1947). This is suggested to be a *robust* semantics, with few variations, as Section 4 will show with the example of the French Historical Present. Second, the pragmatics is expected to be *flexible*, and what makes the difference between tenses is the network of possible usages for each tense.[3] In addition, this hints at an explanation of the difference in uses between tenses in different languages. Grisot (2015, 2018a) has found that the possible translations of the English Simple Past into French are most frequently the French Passé Simple, the Imparfait, the Passé Composé and the Présent.

What is most interesting with the mixed model of verbal tenses is that it allows comparisons between tenses. Supposing we accept the Reichenbachian analysis for the French Passé Simple and Imparfait (with the semantics E,R—S), here are the two paths to describe the usages of these two tenses, given respectively in Figures 18 and 19:

3 Our assumption is exactly the reverse than Amenos Pons (2011) and Escandell-Vidal and Leonetti's (2011) one, where semantics is flexible and pragmatics rigid. Their main argument is based on one assumption in lexical pragmatics, which makes the difference between encoded and inferred concepts. By adopting this approach, conceptual meaning should be flexible. In our interpretation of *ad hoc* concept, this assumption is not mandatory, mainly because the flexibility of concepts is pragmatic, and does not say anything about onceptual meaning. By adopting the theory of concepts in Sperber and Wilson ([1986] 1995), concepts are stable words of the language of thought, with fixed logical properties and variable encyclopaedic entries, the variation being individual.

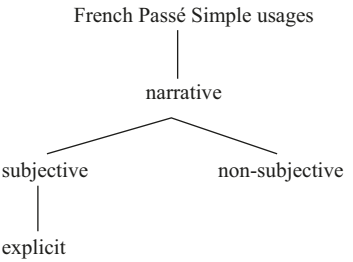

Figure 18: Possible uses of the French Passé Simple.

The usages of the French Passé Simple are narrative, and either subjective-explicit or – more often – non-subjective. The latter is the standard narrative use, whereas the former is illustrated by the following examples (Vuillaume 1990; Tahara 2000):

(283) [+narrative] [–subjective]
Max entra dans le bar. Il alla s'asseoir au fond de la salle.
Max enter-PS in the bar he go- PS himself sit at-the back of the room
'Max entered the bar. He went and sat at the back of the room.'

(284) [+narrative] [+subjective] [+explicit]
Aujourd'hui, personne ne lui adressa la parole.
today no-one NEG him address- PS the speech
'Today, no-one talked to him.'

The usages of the French Imparfait are more complex, and are four in total:

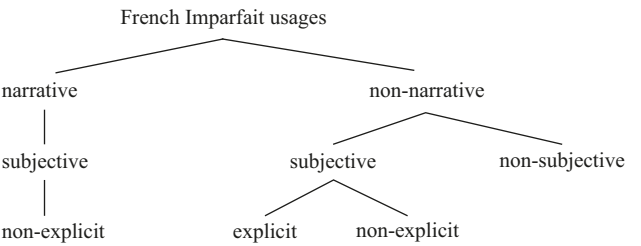

Figure 19: Possible uses of the French Imparfait.

(285) [+narrative] [+subjective] [-explicit]
Marie sauta dans le train. Dix minutes plus tard, le train déraillait.
Mary jump-PS onto the train ten minutes later the train derail-IMP
'Mary jumped onto the train. Ten minutes later, the train derailed'.

(286) [–narrative] [+subjective] [+explicit]
Marie entra dans le bureau. Que lui arrivait- il donc?
Mary enter-PS in the office what her happen-IMP it so
'Mary entered the office. So what happened to her?'

(287) [–narrative] [+subjective] [–explicit]
Le juge alluma une cigarette. La fièvre donnait au tabac
the judge light-PS a cigarette the fever give-IMP at-the tobacco
un gout de fiel.
a taste of gall
'The judge lit a cigarette. The fever gave the tobacco a taste of bile.'

(288) [–narrative] [–subjective]
Les dinosaurs vivaient il y a des centaines de millions d'années.
the dinosaurs live-IMP ago hundreds of millions of years
'Dinosaurs lived hundreds of millions of years ago.'

A final question must be answered: do the usages of both tenses overlap? The answer is no, and this is greatly relevant to the descriptive adequacy of the conceptual-procedural mixed model. All usages in the semantic configuration E, R—S are fulfilled, with the usages of both Passé Simple and Imparfait in complementary distribution, as Figure 20 shows:

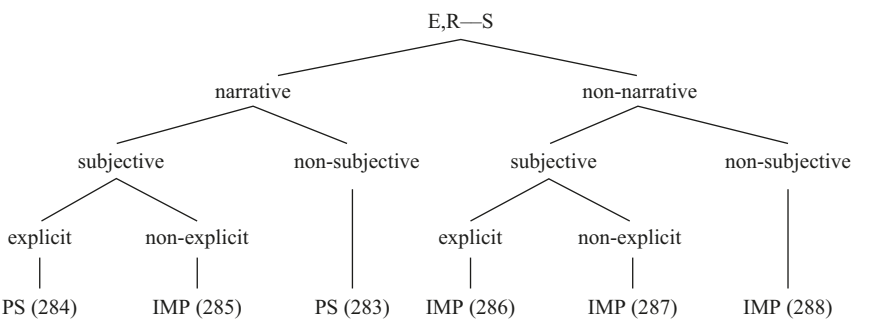

Figure 20: Usages for E,R—S.

However, one consequence of the mixed model, as designed here with a conceptual semantics and a procedural pragmatics, is that the combination of features is triggered by verbal tenses. Put differently, both narrativity and subjectivity are pragmatically inferred from one specific verbal tense. In terms of subjectivity,

this claim has been challenged in Grisot (2018b), which does not support the tense-as-trigger assumption, instead concluding that subjectivity is a more global effect which is neither conceptual nor procedural, but purely pragmatic (that is, inferential), unlike the past-/non-past and temporal/non-temporal order distinctions. This important finding shows that the subjectivity layer must be fed by several types of information. However, the next section restricts the subjectivity issue to one possible trigger – tenses – mainly to provide a precise picture of what makes the difference, at the pragmatic level, between subjective and non-subjective uses of tenses like the French Présent (as used in the Historical Present) and the French Imparfait (as used in the Free Indirect Style).

4 The Historical Present issue

This section considers the Historical Present (HP), and seeks to discover how a tense with a semantics identifying *S, R* and *E* as cotemporal can be used to refer to past events. Here is Schlenker's (2004) example of such a mismatch:

(289) *Fifty-eight years ago to this day, on January 22, 1944, just as the Americans are about to invade Europe, the Germans attack Vercors.*

In chapter 3, the initial analysis for HP was [+PRESENT; −NOW], contrasting with the Imparfait in Free Indirect Discourse [−PRESENT; + NOW], the present of discourse [+PRESENT; + NOW] and the narrative Passé Simple [−PRESENT; − NOW]). The MDIM model requires further description, and for the Reichenbachian semantic description *E,R,S* to be made compatible with the pragmatic approach using the narrative, subjective and explicit features. Schlenker's (2004: 297) analysis is the following:

> The stylistic result is to present the scene in a particularly vivid way, as if the narrator were observing it directly. This can be explained by observing that the present tense is allowed to denote a past moment only because the narrator presents the Context of Utterance, which serves as the point of observation with respect to which the denotations of tenses and pronouns are classified, as having a time coordinate that lies in the past. In other words, by using the Historical Present the narrator presents the utterance as being made from a point that is simultaneous with the event described, and this accounts for the vividness of the description.

In other words, with the HP, there is a shift from the Context of Thought (cotemporal with *S*) to the Context of Utterance (cotemporal with *R*) in the past, as shown in Figure 21, a graphic representation of the type of analysis Schlenker proposes:

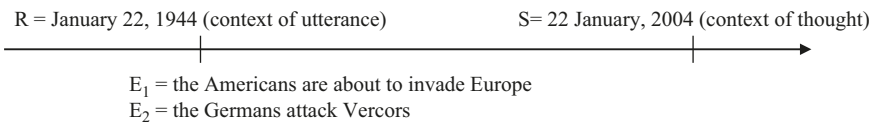

Figure 21: S, R and E in the Historical Present.

According to this analysis we obtain the following semantics: E_1,E_2,R—S. This is explainable if the following semantics rules are admitted for the HP:

Semantic rules for the HP

1. In HP, tenses and pronouns are interpreted in the Context of Utterance.
2. In HP, the actual context if the Context of Thought.
3. Tenses are interpreted in the past.

These rules are justified by Schlenker's following claim (Schlenker 2004: 296):

> Because the Context of Thought is the actual speech act, (i) indexicals such as *tomorrow* or *yesterday* should be evaluated with respect to the actual speech act, and (ii) the assertion should be attributed to the actual speaker.
>
> Because the Context of Utterance is located in the past, the present tense should denote some past moment.
>
> Both properties are in fact found in narrations in the Historical Present.

In other words, the shift from present to past is explained by the location of the context of utterance in the past. This analysis is very interesting, because it is exactly the other way around for the FID (as the next section will show), where the actual context is the context of utterance, and the context of thought is shifted to the past, explaining why indexicals like *today* and *now* can be cotemporal with a past tense, as in (290):

(290) *Tomorrow was Monday, Monday, the beginning of another school week!* (Lawrence, *Women in Love*, 185. London: Heinemann, 1971; cited in Banfield,1982: 98)

For the model to account for the temporal shift from *S* to *R* without changing the semantics, the following argument is made:

– First, in Schlenker's proposal, the present tense in HP is interpreted in the context of utterance, located in the past (E=S), whereas the context of thought is disjointed from the context in which the event is evaluated (E<R). In my analysis, on the other hand, the context of thought is anterior to NOW, which is the context of speech.

– Second, my pragmatic approach makes a crucial difference between what is linguistically encoded and what is pragmatically inferred. What is linguistically encoded in the HP is the relation between E and R (that is, E=R); what is inferred is the result of feature composition combined with the semantics of the present. The combination of pragmatic features and the minimal semantics (E=R) yields the HP interpretation (R≠S), summarized in (291):

(291) {[±narrative], [+subjective], [±explicit]} ∧ [E=R] +> [R≠S][4]

In other words, the HP implicates [R≠S] and the present is as such interpreted in the context of thought, which is dissociated from *S*; so, the disjunction between R and S is pragmatically inferred. This is what allows the past interpretation (E<S):

(292) *Present tense Semantics + HP Pragmatics entail the HP past interpretation*
[E=R] ∧ R≠S] → [E<S]

Thus, the HP meaning is the result of the semantics of the present tense and the pragmatics of HP.

5 Narration, directional inferences and FID

While one exception to narrative discourse – the combination of narration and subjectivity – has been examined, yet to discuss is how subjectivity can be disconnected from narration. This is the case in Free Indirect Discourse (FID), first addressed in French in Lips (1926) (see also Bally 1912; Cerquiglini 1984 for a historical summary of FID). This topic was first considered from a linguistic standpoint in the seminal work by Ann Banfield (1982), who was the first to create a true linguistic analysis of what was traditionally analysed according to stylistics (see Reboul 1992 for the first pragmatic discussion of Banfield's analysis, and also Reboul 2010). The classic view of FID can be restated in these terms (Philippe 2000: 4):

4 In Moeschler (2019b), the analysis of usages of the French Historical Present, based on a sample of examples taken from Blaise Cendrars' *Rhum*, restricts these usages to the following features combination: [±narrative] [+subjective] [±explicit]. In other words, a HP interpretation is always subjective, but can or not be narrative, as well the perspective can or not be made linguistically explicit.

> The presence of shifters or subjective markers not attributed to the narrator (free indirect style and point of view) has to be analysed in a dialogical frame: two instances share the validation of elements of the utterance (in a sentence in the free indirect style; for instance, the narrator validates, when possible, the third person and the past, the character validates the predicative content, the possible subjectivemes and deictics).[5]

An immediate objection arises to this dialogical analysis of Free Indirect Discourse. First, if the narrator licenses tenses and pronouns, he is manipulating the reader, since he knows that what the third person thinks is false, as shown in this famous example from Flaubert's *Éducation sentimentale* given by Reboul (1992):

(293) Il [Frédéric] s'y montra gai. Mme Arnoux *était* maintenant auprès de sa mère à Chartres. Mais il la retrouverait bientôt et finirait par être son amant. (Flaubert, *L'Education sentimentale*, cited in Reboul 1992: 57)
'He [Frédéric] displayed the utmost gaiety on the occasion. Madame Arnoux was now with her mother at Chartres. But he would soon come across her again, and would end by being her lover.' (Flaubert, *Sentimental Education*, New York, Walter Dumz, 1904)

Even though every reader of the *Éducation sentimentale* knows that Frédéric will never be Madame Arnoux's lover, at the time he reads the clause *Mais il la retrouverait bientôt et finirait par être son amant* 'But he would soon come across her again, and would end by being her lover', he infers that this is Frédéric's thought, and neither a prediction by the author nor a fictional representation of the *narrator*. If this assertion is made by the narrator, then either he is writing an inconsistent fiction (it is true that Frédéric will and will not be Madame Arnoux's lover) or he is manipulating the reader, and wanting him to believe that this will be the case. However, the relevant question is why should he act like this.

There is serious resistance to taking data from FID into account, especially in the French tradition. Here is a representative quotation by Ducrot (1984: 172), showing his refusal to incorporate these data:

> Breaking away from the normal description of free indirect style as one of the forms of reported speech, Ann Banfield sees the expression of a point of view, which cannot be that of the person who is genuinely, empirically, the author of the utterance, and she uses the term of "subject of consciousness" to designate the source of this point of view.

5 "La présence d'embrayeurs ou de marquages subjectifs non-imputables au narrateur (discours indirect libre et point de vue) doit s'envisager dans un cadre dialogique: deux instances se partagent la validation des éléments de l'énoncé (dans une phrase au discours indirect libre, par exemple, le narrateur valide, le cas échéant, la troisième personne et le passé, le personnage valide le contenu prédicatif, les éventuels subjectivèmes et déictiques)".

> But, at this point – that is, at the point where a plurality of subjects could be introduced into the utterance – Banfield formulates two principles to remove this threat. First, she posits that there can be, for a given utterance, only one subject of consciousness, immediately discarding as abnormal those examples which would manifest a plurality of points of view, juxtaposed or interwoven. And then, to solve the cases where this subject of consciousness is not the *empirical* author of the utterance, she posits that there is, in these utterances, no speaker.[6]

The analysis is sound, but misleading. Ducrot implies that the data disconfirm Banfield's position, which is untrue: the accuracy at the descriptive level is one of the most impressive qualities of Banfield's work. Ducrot's principal idea is that it is impossible not to imagine that behind a speaking subject *(sujet parlant)* are hidden several discourse entities, like a speaker, responsible for the speech act, and what Ducrot calls *énonciateurs*, the voices or points of view expressed in the speaker's utterance. What really impresses about Banfield's argumentation, mainly syntactic, is that it does not leave open the question of who is thinking or talking in Free Indirect Discourse Anne Banfield's answer is that these sentences are unspeakable: they have no speaker. Nonetheless, her analysis is compatible with Schlenker's, mainly because his theory of context shift explains why tenses and pronouns are interpreted in the context of utterance and indexicals in the context of thought. According to Schlenker's theory, the shift of context does not impact tenses, only indexicals. Furthermore, the actual context is the context of utterance, not the context of thought, leaving unanswered the puzzle of "who believes that Frédéric will be Madame Arnoux's lover". A third path must be found to resolve this issue.

According to this book's approach to tenses, the semantics of the French Imparfait – which is the tense used for FID (where English makes no difference between narrative and non-narrative usages of the Simple Past) – is left untouched, as *E,R—S*. However, pragmatics should provide some information about the type of meaning of the Imparfait used in FID. In Figure 19, the answer given is that FID corresponds to the string of features [–narrative] [+subjective] [+explicit]: it is not narrative, because no temporal order is at work in the representation of

6 "Rompant avec la description habituelle du style indirect libre comme une des formes du discours rapporté, Ann Banfield voit l'expression d'un point de vue, lequel ne peut pas être celui de la personne qui est effectivement, empiriquement, l'auteur de l'énoncé, et elle emploie le terme de « sujet de conscience » pour désigner la source de ce point de vue. Mais, arrivée à ce stade, c'est-à-dire au moment où une pluralité de sujets pourraient être introduits dans l'énoncé, Banfield formule deux principes qui écartent cette menace. Elle pose d'abord qu'il ne peut y avoir, pour un énoncé donné, qu'un seul sujet de conscience, repoussant d'emblée dans le domaine de l'anormal les exemples qui feraient apparaître une pluralité de points de vue juxtaposés ou imbriqués. Et ensuite, afin de traiter les cas où ce sujet de conscience n'est pas l'auteur empirique de l'énoncé, elle pose qu'il n'y a pas, dans ces énoncés, de locuteur".

thought or speech; it is subjective, because it is assigned to a SELF (subject of consciousness, in Banfield's terminology); and finally, it is typically explicit, although it can be implicit. This latter point is shown in (294) – *Tomorrow was Monday, Monday, the beginning of another school week!* – where there is no explicitation of the subject of consciousness, even if there is certainly such a SELF. The exclamative sentence and the presence of temporal indexicals are cues that there is a self or a subject of consciousness thinking as a first person, as in (294):

(294) "*Tomorrow is Monday, Monday, the beginning of another school week!*", *she thought.*

We have now a global picture of the contribution of tenses to discourse, whether it is a narration, a Free Indirect Discourse, or a vivid representation in the Historical Present. Narration is mainly governed by temporal order or directional inferences [+narrative], and does not require perspectival thought; Free Indirect Discourse is perspectival [+subjective], and not temporally ordered [–narrative]; and narration in the Historical Present is both temporally ordered [+narrative] and perspectival [+subjective]. The possibility to interweave these "styles" is predictable, because they each stress one aspect of meaning: representational (with temporal order) or non-representational (with FID and HP). This is exactly what happens in the short story by Stendhal, repeated here, where the narration shifts from the Passé Simple to the Présent:

(295) *[. . .] Le curé n'était point vieux; la servante était jolie; on jasait, ce qui n'empêchait point un jeune homme du village voisin de faire la cour à la servante. Un jour, il cache les pincettes de la cuisine dans le lit de la servante. Quand il revint huit jours après, la servante lui dit : [. . .]*
'[. . .] The curate wasn't old at all; the maid was pretty; but the gossip about them was not enough to stop a young man from the neighbouring village courting the maid. One day, he hid the kitchen tongs in the maid's bed. When he came back eight days later, the maid said to him: [. . .]'

Table 30 summarizes these findings:

Table 30: Directional inferences and subjectivity entrenched.

	+narrative	**–narrative**
+subjective	Historical Present	Free Indirect Speech
–subjective	Narration	–

The beauty of symmetry compels us to find a tense which can fill the empty cell [–narrative][–subjective], one candidate for which is the French Présent in news headlines. In French, these are always in the present tense, rather than a past tense. (296) to (298) are headings taken from the Swiss French newspaper *La Tribune de Genève*, on April 2018:

(296) Une plainte pour viol vise Tariq Ramadan à Genève.
A charge for rape target-PR Tariq Ramadan at Geneva
'Rape charge against Tariq Ramadan in Geneva.'

(297) Seabubble fait le coup de la panne par un vendredi 13.
Seabubble do- PR the hit of the breakdown on a Friday 13
'Seabubble gets KO on Friday 13.'

(298) La justice ordonne le gel des biens de Johnny.
the justice order- PR the freezing of the goods of Johnny
'Justice orders the freezing of Johnny's property.'

6 Conclusion

This chapter has tried to provide a coherent picture of temporal relations, and of the conceptual and procedural meanings of tenses. The main finding is that the mixed conceptual-procedural model proposed here maintains both a semantic and a pragmatic layer. The next part of the book, which studies causality and connectives, aims to make this compatible with the non-lexical information represented in non-lexical items like tenses and connectives. The challenge is now clear: if the model is sound, it should be possible to combine the mixed conceptual-procedural model with a theory of conceptual-procedural meaning for connectives. The compatibility of these models gives a clear advantage in combining compositional semantics and inferential pragmatics, as will be demonstrated in the next two chapters.

Part III: **Causality**

5 Causality, temporal order and argumentation

1 Introduction

This chapter is about causality and temporal order. Part II described how the temporal organization of discourse matches one basic property of time (time is forward oriented), and one way of talking about time – narration – linguistically represents time as moving in parallel to the progression of the discourse. This is the *iconic* way of representing time in natural language. In chapter 4, I gave watertight arguments that showed how a language like French has conventional means of triggering such forward inferences, mainly using the Passé Simple, a tense which is closely associated with forward inferences (unlike the Simple Past in English), albeit not semantically (temporal order is defeasible with the Passé Simple). Chapter 4 also showed that there is a counterpart temporal relation to forward inference – backward inference, where time goes back – but that this backward temporal relation is not just temporal, but also causal. This presents an interesting challenge: whereas forward temporal inferences can be causal, backward inferences are always causal, but can lack temporal meaning. Table 31 is a summary of these four temporal and/or causal relations:

Table 31: Temporal and causal relations.

	forward	**backward**
+ causal **+ temporal**	*Mary pushed John. He fell*	*John fell. Mary pushed him*
+ causal **– temporal**	*Mary is a minor. She cannot drink alcohol*	*Mary cannot drink alcohol. She is a minor*
– causal **+ temporal**	*Mary took a shower. She prepared the coffee*	*Mary prepared the coffee. She had taken a shower*

Besides the relation between temporality and causality, a futher issue can be identified. In the *backward* causal relation, a discourse connective is available, with the most obvious candidates *because* in English and *parce que* in French (Moeschler 2003, 2011), as shown in (299) to (302):

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(299) *John fell because Mary pushed him.*

(300) *Mary cannot drink alcohol because she is a minor.*

(301) *Jean est tombé parce que Marie l' a poussé.*
John BE-3PS fallen because Mary 3PS-PRO HAVE-3PS pushed
'John fell because Mary pushed him.'

(302) *Marie ne peut pas boire d'alcool parce qu'elle est mineure.*
Mary NEG can NEG drink alcohol because she is minor
'Mary cannot drink alcohol because she is a minor.'

In temporal discourse, *because* is not acceptable, and a better means of expression uses the connective *after*, which makes the backward temporal relation explicit:

(303) *Mary prepared the coffee after she had taken a shower.*

In the forward order, the expected discourse connective is *and* (*then*) and *et* (*ensuite*) when the relation is temporal, and *donc* and *so* when the relation is not temporal:

(304) *Mary pushed John and he fell.*

(305) *Mary took a shower and prepared the coffee.*

(306) *Mary is a minor, so she cannot drink alcohol.*

This chapter's primary goal is to disentangle causality from temporal order. A general model of causality will be developed in section 2 (Moeschler 2003). The main idea is that causal relations in natural language are expressed in a non-iconic, and therefore ante-chronological, order (Grisot 2018a), whereas temporal order follows an iconic, and therefore chronological, order (section 3). In section 4, a major distinction will be made between causality, which is a relation between events and/or states, and discourse relations like explanation and justification, which express causal relations between utterances. Last but not least, one purpose of this chapter is to explain why causal relations in discourse can express argumentation, and conversely why argumentation can be marked with causal connectives like *because* or *parce que* in

French (Moeschler 2014) (section 5). The issue of causal connectives will be extensively developed in chapter 6.

2 A model for causality

This section seeks to discover what causality is, why it is a pragmatic effect of discourse rather than a semantic relation, and why some connectives are specifically or occasionally used to express causal relations, questions which will be seen to be closely related. On the first –what causality is – Hume has given reasons why causality is so important for cognition:

> All reasonings concerning matter of fact seem to be founded on the relation of Cause and Effect. By means of that relation alone we can go beyond the evidence of our memory and senses. [. . .]. All our reasonings concerning fact are of the same nature. And here it is constantly supposed that there is a connexion between the present fact and that which is inferred from it. Were there nothing to bind them together, the inference would be entirely precarious. (Hume [1939–1749] 1975: 26)

Hume's definition of causality (*causation* in his terms) is well-known. Here is one of many possible quotations that makes his definition almost complete:

> The idea, then, of causation must be deriv'd from some relation among objects; and that relation we must now endeavour to discover. I find in the first place, that whatever objects are consider'd as causes or effects, are *contiguous*; and that nothing can operate in a time or place, which is ever so little remov'd from those of its existence. Tho' distant objects may sometimes seem productive of each other, they are commonly found upon examination to be link'd by a *chain of causes*, which are contiguous among themselves, and to the distant objects; and when in any particular instance we cannot discover this connexion, we still *presume* it to exist. We may therefore consider the *relation of contiguity as essential to that of causation*; [. . .]
>
> The second relation I shall observe as essential to causes and effects, is not so universally acknowledg'd, but is liable to some controversy. 'Tis that of priority of time in *the cause before the effect*. [. . .] But beside that experience in most instances seems to contradict this opinion, we may establish the relation of priority by a kind of *inference or reasoning*. (Hume [1739–1740] 1896: 45; emphases are mine)

This long quotation is crucial, because it provides some of the standard ideas about causality: (i) it is a relation between *objects*; (ii) *contiguity* is essential to causality, implying that the objects in a causal relation are contiguous; (iii) causality is realized by *chains of causes*; (iv) causes *precede* effects; and (v) causality is established by *reasoning* or inferences. Moeschler (2003: 343) makes a key difference between causality's linguistic aspects (semantic properties like spatiotemporal contiguity and temporal asymmetry) and pragmatic aspects, such

as contingency (causal inferences are defeasible), generality (causality is a rule-based relation; see Blochowiak 2014a) and above all *ceteris paribus* conditions (sensitivity to context). Reboul (2003: 45) has given a very precise formal description of Hume's schemata of causality:

A is contiguous to B
A precedes B
Always/Most of the time, A precedes B
∴ A cause B
A cause B = $\Box\forall x[A(x) \Rightarrow \exists y\{B(y)\} \& x < y]$
Necessarily for x, if x is an A, then there is some y such that y is a B and x precedes y (translation is mine)[1]

In other words, contiguity and temporal precedence allow causality to be inferred. Using a more contemporary version of Hume's definition, causality is defined according to a double counterfactual, both positive and negative, as in (307) and (308) (Reboul 2003: 46):

(307) If an event of type A had happened, an event of type B would have happened.

(308) If an event of type A had not happened, an event of type B would not have happened.

For instance, if A is the event of a rolling ball hitting another ball, and B is the moving event of the second ball, then the event A causes the event B. In this case, A is contiguous to B, A precedes B, events of type A usually cause events of type B, and we can therefore conclude that A causes B. This relation can be defeated by the *ceteris paribus* condition, simply because something unexpected can block the second event. Generally, to light a match there must be oxygen, the match must be dry, etc.; if one of these conditions is not met, the

1 "A est contigu à B
A précède B
Toujours/ la plupart du temps, A précède B
∴ A cause B
A cause B = $\Box\forall x[a(x) \Rightarrow \exists y\{B(y)\} \& x < y]$

Nécessairement pour tout x, si x est A, alors il existe y tel que y est B et x précède y". (Reboul 2003: 45)

match will not ignite. With the example of the balls, a vertical glass wall might be placed in front of the second ball, blocking the contact (contiguity) and therefore the causal relation between the two events.

To establish from such preliminary definitions a model of causality in discourse, I will begin by examining causal relations in the real world. Typically, a causal relation is between *events*: as above, if an event A causes an event B, A and B are contiguous, A precedes B temporally, and there is a general temporal relation between A and B. However, in between A and B there is an intermediate phase, filled by a resulting state of the event A. When event B occurs, it destroys the newly created state, and a causal chain is constructed. This is what Asher (1993), following Bach (1981), calls natural language metaphysics (Asher 1993: 7-8; see also chapter 3):

> Many linguists and philosophers have distinguished between states and events, or activities and accomplishments. Events have often been described as "punctual" or as "containing their initial and final endpoints", while states and activities have been described as "open-ended" or "not containing their initial and final, temporal endpoints".

At this point, we can imagine two types of causal relations between events and states: a *direct* relation and an *indirect* one. Direct causality – causality in the strong sense – is a relation in which no temporal discontinuity happens: no intermediate event interferes between the cause and the effect. But with indirect causality – causality in the weak sense – the relation between the cause and the effect is mediated by other events in a causal chain. In Figure 22, direct and indirect causalities are illustrated, where squares represent events and circles states:

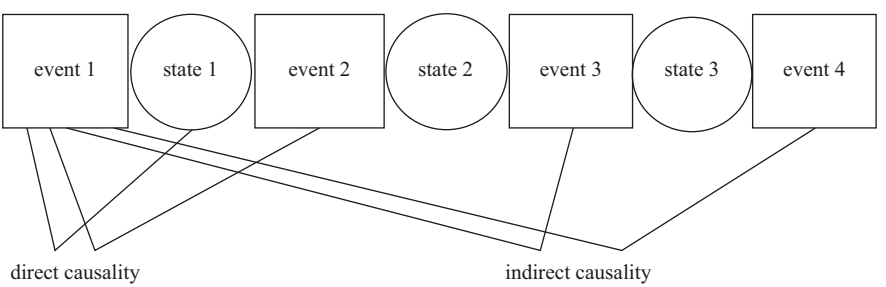

Figure 22: Direct and indirect causality.

To illustrate these two different types of causality, imagine the following values for the events and states in Figure 22:

(309) e_1: Mary pushes John
s_1: John wobbles
e_2: John falls
s_2: John's head is injured
e_3: John is transported to the hospital
s_3: John is in the hospital
e_4: the surgeon operates on John

In (310), a short story connects these events and states:

(310) *Mary pushed John* (e1). *He wobbled* (s1) *and fell* (e2), *and his head was seriously injured* (s2). *He was transferred* (e3) *to hospital* (s3). *There the emergency surgeon decided to operate on him* (e4).

Several shortcuts between these events and states can be established. (311) has examples of forward causal relations between events and/or states, whereas the same relations are presented as backward in (312):

(311) a. *Mary pushed John. He fell.*
b. ? *Mary pushed John. He is in the hospital.*
c. ?? *Mary pushed John. He has been operated on.*

(312) a. *John fell. Mary pushed him.*
b. ? *John is in the hospital. Mary pushed him.*
c. ?? *John has been operated on. Mary pushed him.*

As (311) and (312) show, the more distant the events, the worse – thus, less coherent – the discourse.[2] So, it can be tentatively concluded that direct causality is more easily acceptable, and more easily grasped, than indirect causality. This does not mean that indirect causality is not a possible means of expressing causal relations in discourse, but that this is only possible when a very direct, habitual or frequent causal relation is accessible. For instance, the following distal relations between causes and events are acceptable:

2 In this book, the issue of coherence in discourse will not be discussed. See Reboul and Moeschler (1998) for a critical discussion of coherence-based approaches to discourse. See also Reboul and Moeschler (1997) for a methodological discussion about discourse.

(313) *kill – be prosecuted*
work – be promoted
write – be published
marry – have children
be invited to a conference – give a lecture

So (314) is certainly acceptable, even if there is no contiguity between the two events:

(314) *Jacques gave a lecture at the INPRA 2018 conference: he had been invited by Istvan.*

The last issue to discuss in this general introduction to causality is the difference between *iconic* and *non-iconic causality*. In iconic causality, the cause event precedes the consequence event; in non-iconic causality, the consequence event precedes the cause event.[3] (315) is an example of iconic causality, whereas (316) illustrates non-iconic causality:

(315) *Mary pushed John. He fell.*

(316) *John fell. Mary pushed him.*

In Chapter 6, I will defend the claim that there are no iconic causal connectives in natural language, only non-iconic causal connectives. In the next section, I give typological, discursive and experimental arguments in favour of this claim. Meanwhile, I would like to stress that fronted or reversal uses of causal connectives like *because* and *parce que* cannot be considered as their ordinary uses, as causal connectives like English *because* and French *parce que* introduce new information, and new information is not generally fronted. Jackendoff (2002: 249) proposes a generalization termed the "Agent First, Focus Last" rule, justified as follows: "I suggest [. . .] that Agent First, Focus Last, and Grouping are "fossil principles" from protolanguage, which modern languages often observe and frequently elaborate". It is worth noting that this constraint not only makes the iconic use of a causal connective in (317) more constrained than the ordinary non-iconic use, but also makes it heavier in terms of cognitive effect:

3 I choose the term *consequence* instead of *effect* or *result*, because of the strong semantic relation between cause and consequence in natural language.

(317) *Because Mary pushed John, he fell.*

For instance, in the lyrics of *Because* (*Abbey Road*) by the Beatles, *because* is fronted to an unusual focus position, creating unexpected causal relations between the causes and the consequences:[4]

(318) *Because the world is round, it turns me on* [. . .]
Because the wind is high, it blows my mind [. . .]
Because the sky is blue, it makes me cry.

Following Jivanyan and Samo (2017), the fronted iconic order with causal connectives is predicted to be more than just an exception to the rule.

3 Causal relation as a non-iconic relation

Section 2 showed that there are two types of causal relation between events (iconic and non-iconic relations), and that the preferred uses of marked causal sequences with a connective are non-iconic; the exceptions to this are fronted sequences like *because P, Q*, which introduce special effects linked to the new or focal status of the cause or the unexpected causal relation between the cause and the consequence, as in the Beatles' *Because*. The question is why causal relations in discourse should be non-iconic, and thus backward rather than forward. Three arguments can be given for a clear distinction between temporal forward discourse relations and causal backward relations. The first is typological (Diessel and Hetterle 2011), the second based on discourse analysis (Labov 1973), and the third on experimental pragmatics (Moeschler et al. 2006).

A. *The typological argument*. Diessel and Hetterle's (2011) remarkable empirical work, based on a sample of 60 languages, demonstrated that "causal clauses tend to be more independent of the associated main clause than other semantic types of adverbial clauses". In their sample of languages, they show that *causal* clauses are 45% final, 25% initial and 30% mixed in opposition to 1.7% final, 45% initial and 53.3% mixted *temporal* and *conditional* clauses. So, "In contrast to temporal and conditional clauses, causal clauses predominantly follow the (main)

4 I assume that this initial position is focal, because this position is marked and unexpected. Moreover, there seems to be a conflict between an initial position, which should introduce a given information rather than a focal one. This is moreover supported by the generic proposition that *because* introduces. My proposal is, however, that this contrast introduces an unexpected consequence, as *it turns on me*, presented as causally resulting from *the world is round*.

clause [. . .]". The data prove this to be true for English, German and Mandarin Chinese. In English, causal clauses are 100% final in their sample (40.9% for conditional and 65.6% for temporal); in German, they are 76.6% final (30.1% for conditional and 50.9% for temporal); and finally, in Mandarin Chinese, the difference is even clearer, with 73.9% of causal clauses final (13% for conditional and 9.1% for temporal). The only exception is Japanese, a Subject-Object-Verb language, with 53% of causal clauses initial versus 47% of causal clauses final, where conditional/temporal are overwhelmingly initial (91%).

Diessel and Hetterle give a functional and communicative explanation of these facts, claiming that "causal clauses are commonly used to support a previous statement that has been challenged by the hearer". This conclusion, based on conversational data from German, Mandarin Chinese and Japanese, will be strengthened by a cognitive argument explaining why causal clauses are final – thus, why the CONSEQUENCE-CAUSE order is preferred in discourse –an argument which will be supported by the analysis of causal connectives in chapter 6.

B. *The discourse argument*. In one chapter of *Language in the Inner City (The Transformation of Experience in Narrative Syntax)*, Labov (1973) gives a general definition of *narration*, one he reuses in a more recent article (Labov 2011): "A narrative is defined here as one way of recounting past events, in which the order of narrative clauses matches the order of events as they occurred". (319) is an example of such a narrative:

(319) a. *Well, this man had a little too much to drink*
b. *and he attacked me*
c. *and a friend came in*
d. *and she stopped it*.

So, a narrative is defined by way of the temporal order relation (chapter 3) for past events. However, these past events might be reported differently, without temporal order: the order c, d, a, b, as shown in (320), is a non-narrative order and "employs a variety of grammatical devices within a single clause".

(320) *A friend of mine came in just in time to stop this person who had had a little too much to drink from attacking me*.

(320) is not a narrative but an *explanation* of what happened. As such, events can be reported either in a narrative way, with temporal order, or in an explicative way, with a backward temporal relation. It is worth noting that if the same situation is described in both types of discourse – so, if their truth conditions

are identical – the pragmatic effects are not the same. Compare the two small discourses in (321) and (322):

(321) (a) *John fell into a precipice*. (b) *He broke a leg*.

(322) (a) *John broke a leg*. (b) *He fell into a precipice*.

The reason for the pragmatic difference is that (321b) answers question (323), whereas (322b) answers question (324):

(323) *What happened then?*

(324) *Why did John break a leg?*

Explanations thus answer *why*-questions (Blochowiak 2014a), whereas *narrations* answer *what-then*-questions. The discourse argument can then be summarized as follows: in explanation, the cause follows the consequence because it answers a *why*-question, explaining why the cause yields such and such a consequence.

C. *The cognitive argument*. Moeschler et al. (2006) detail experiments on reading times for cause and consequence sentences (see Moeschler 2016b for a summary of the argument), with help from researchers from the Marc Jeannerod Institute for Cognitive Sciences (Coralie Chevallier, Thomas Castelain and Jean-Baptise van der Henst). Having elicited CAUSE (20 subjects) and CONSEQUENCE (18 subjects) sentences from 36 event sentences with the same syllable pattern (8) and tense (the French Passé Composé), a self-paced reading task was conducted, based on 10 pairs of propositions, 5 pairs of strongly associated propositions (where more than 50% of answers provided were similar) and 5 weakly associated propositions (where fewer than 35% of answers provided were similar), with both forward and backward orders. Two conditions were tested: the strength of the association, and the order of the clauses (CAUSE-CONSEQUENCES vs. CONSEQUENCE-CAUSE). Table 32 gives a series of inputs for a second reading time experiment.

These pairs of propositions were balanced out with 20 unlikely utterances, in both orders (CAUSE-CONSEQUENCES vs. CONSEQUENCE-CAUSE), with all 40 utterances being checked by control utterances. Table 33 gives the mean reading times for the second proposition.

How can these results be interpreted? A post hoc Tukey's Honest Significiance Difference test shows that the difference between the iconic order (CAUSE-CONSEQUENCE) and the non-iconic order (CONSEQUENCE-CAUSE) is only

Table 32: A sample of ten propositions for experiment 2.

Strength of association	Proposition 1	Proposition 2 (consequence)	% answers	Proposition 2 (cause)	% answers
Strong	*Paul a pris ses médicaments,* 'Paul took his medicine'	*il va guérir.* 'he will recover'	50	*il était malade.* 'he was sick'	94
	Le gendarme a beaucoup couru, 'the cop ran a lot'	*il est essoufflé.* 'he is out of breath'	85	*il poursuivait quelqu'un.* 'he was running after someone'	94
	Jérôme a arrosé les plantes, 'Jérôme watered the plants'	*elles poussent mieux.* 'they are growing faster	50	*elles avaient besoin d'eau.* 'they needed water'	55,5
	Jean s'est acheté des lunettes, 'John bought himself some glasses'	*il voit mieux.* 'he can see better'	70	*il avait des problèmes de vue.* 'he had vision problems'	50
	Le vase de cristal est tombé, 'the crystal vase fell down'	*il s'est cassé.* 'it broke'	70	*quelqu'un l'a fait tomber.* 'someone dropped it'	50
Weak	*Marie s'est tordu la cheville,* 'Mary sprained her ankle'	*elle doit se soigner.* 'she must have it treated '	20	*elle faisait du sport.* 'she was playing sports'	16,6
	La barque a heurté le rocher, 'the boat struck the rock'	*elle a coulé.* 'it sank'	35	*il y avait du courant.* 'there were currents'	16,6
	Marie a lu sans ses lunettes, 'Mary read without her glasses'	*elle n'a rien vu.* 'she couldn't see anything'	15	*elle voit bien de près.* 'she is short-sighted'	22,2
	Le chien a attrapé des puces, 'the dog has got fleas'	*on va l'emmener chez le vétérinaire.* 'he will be taken to the vet'	20	*il s'est roulé dans l'herbe.* 'he rolled in the grass'	16,6
	Véronique s'est lavé les mains, 'Veronica washed her hands'	*elle va passer à table.* 'she is going to have dinner'	25	*elle avait jardiné.* 'she had done some gardening'	22,2

Table 33: Reading times (means).

	Weak association	Strong association	Mean
Consequence-cause (ms)	164.8	100.3	132.55
Cause-consequence (ms)	308.84	0.04	154.44
Mean (ms)	236.82	50.17	143.5

significant with weak association ($p<.01$). The causal reading in non-iconic order (CONSEQUENCE-CAUSE) is quicker than in the iconic order (CAUSE-CONSEQUENCE) – 164.80 ms compared to 308.84 ms. Even though the same result is not obtained in the case of strong association – what has been described as direct or strong causality – non-iconic order (CONSEQUENCE-CAUSE) is preferred with indirect or weak causality. This suggests that this preference is not arbitrary: not only is it explainable from a typological perspective, it also makes sense from a discourse perspective (CAUSE-segments answer *why*-questions), and now from a cognitive perspective. Last but not least, these clear linguistic, discursive and cognitive correlations will be reinforced in chapter 6, by the analysis of causal and inferential connectives in French.

4 Causality, explanation, inference and justification

Up to now, I have used two concepts in the discussion of causality: the concept of CAUSE, for the causal relation between events and states, and the concept of EXPLANATION, defined as a discourse relation between discourse segments. These two concepts have been proven not to be synonymous, since a causal relation between events can be obtained in both an iconic order, as in narration, and a non-iconic order, as in explanation. Explanation, too, is shown not to be necessarily about events – for instance, when the cause segment explains why a state or fact is true, as in *Mary cannot drink alcohol; she is a minor*. The final concept to be introduced is the concept of *justification*, which does not scope over a semantic relation between events or states, as it answers a *why*-question (326) different than that of an explanation (325):

(325) *Why*-question for an explanation: *why is the consequence the case?*

(326) *Why*-question for a justification: *why is the speaker saying what he is saying?*

Take the example of (327), in which it is ambiguous whether the *why*-question scopes over the reason for an event, or the reason for saying that something is the case. This is made explicit in (328), and in the answers provided in (329):

(327) Jacques *Abi is coming home this week-end.*
Anne *Why?*

(328) Why1: *Why is Abi coming this weekend?* = What is the reason for her coming?
Why2: *Why are you telling me this?* = Of course, I know she is coming.

(329) a. *She wants to meet her friends at home.*
b. *I wasn't sure she'd told you.*

When a reason for an event is given, the explanation requires the CAUSE-CONSEQUENCE relation to be acceptable because certain general causal patterns apply. For instance, meeting her friends at home is a reason explaining Abi's coming home for the weekend. From another perspective, asking a *why*-question shows that the reason for a fact or an event is not available, or is unknown to the speaker. Many possible solutions remain – Abi could have decided to come home because she misses her parents, because her brother is at home this weekend, because she has an appointment with her doctor, or because she wants to spend a weekend beside the pool – all of which are acceptable, reasonable and explain her coming home.

It is also worth emphasizing that a dedicated causal connective is available: *because* in English, and *parce que* in French. The general issue of causal connectives will be developed in chapter 6, but I would like to introduce here a classic analysis of connectives proposed by Sweetser (1990). In her book, Sweetser made a substantial contribution to the analysis of discourse connectives by distinguishing three uses of a connective like *because*: content, epistemic and speech act. The examples in (330) are illustrations of three types of use of *because*:

(330) a. *John came back because he loved her.*
b. *John loved her, because he came back.*
c. *What are you doing tonight, because there's a good movie on.*

Here is Sweetser's analysis of these examples (Sweetser 1990: 77):

> In the first example [330a], real-world causality connects the two clauses: that is to say, his love was the real-world cause of his coming back. In the second sentence, however, the causality would appear to be reversed, but it is not. Example [330b] does *not* most naturally mean that the return caused the love in the real world; in fact, under the most reasonable interpretation, the real-world causal connection could still be the one stated in [330a], though not necessarily. Rather, [330b] is normally understood as meaning that the speaker's *knowledge* of John's return (as a premise) causes the *conclusion* that John loves her.
>
> Going a step further, [330c] would be totally incomprehensible sentence if the conjunction were understood in the content domain. Since the main clause is not even a statement, the *because*-clause cannot be understood as stating the real-world cause of the event or situation described in the main clause. Rather, the *because*-clause gives the cause of the *speech act* embodied in the main clause. The reading is something like "I *ask* what you are doing tonight because I want to suggest that we go see this good movie."

The distinction between the three domains allows for the following assumptions: (i) in the *content* domain, there is a *causal relation* between a CAUSE-event and a CONSEQUENCE-event (in other words, the cause explains the consequence); (ii) in the *epistemic* domain, the relation is not a causal relation between events (even though a causal iconic relation holds in most cases) but an *inference* from a premise to a conclusion, which is a speaker's epistemic state and thus a belief; (iii) finally, in the *speech act* domain, the *because*-clause is the *justification* of the speech act uttered by the speaker (here, a question). So, a strict use of the concepts of *explanation, inference* and *justification* would be restricted to the content, the epistemic and the speech act domains respectively.

As Sweetser herself recognizes, it would be a little strange to consider that there is not causal relation in (330b) ("[330b] is normally understood as meaning that the speaker's knowledge of John's return (as a premise) causes the conclusion that John loves her"). But the knowledge that love can imply the return of the lover does little to help the addressee conclude that John loves her, as the invalid reasoning in (331) shows, whereas this is exactly what happens in (330a), with the content domain interpretation in (332):

(331) a. premise: John came back
b. premise: If John loves her, he will come back
c. conclusion: John loves her.

(332) a. premise: John loves her
b. premise: If John loves her, he came back
c. conclusion: John came back

Reasoning (331) therefore has as a logical form *Q, if P then Q* ⊢ *P*, which is logically invalid (*Affirmation of the consequent*, cf. chapter 7), whereas (332) is a valid reasoning with the logical form *P, if P then Q* ⊢ *Q*, corresponding to a standard *modus ponendo ponens*. This indicates another type of inference, not deductive but abductive, whose format is something like *P; if P then it is because Q* ⊢ *Q*, an abductive and acceptable conclusion (Jivanyan and Samo 2017):

(333) a. premise: John came back
b. premise: If John came back, it is because he loves her
c. conclusion: John loves her is the reason why he came back

This is not a trivial conclusion, because it means that in the epistemic domain of a connective like *because*, the inference is the connection between a fact and the reason for believing something (a proposition). On the other hand, in the content domain, the causal inference (John's love is the cause of his return) is true because the consequence, assumed as old information, is causally entailed by the cause, promoted as new information. In other words, (330a) and (330b) are just the contraction of the parallel following exchanges:

(334) Content domain
A: *John came back*.
B: *Why did he come back?*
A: *Because he loves her*.

(335) Epistemic domain
A: *John loved her*.
B: *Why do you believe this?*
A: *Because he came back*.

In interpreting the *speech act* domain it must be established which type of inference explains the use of a causal connective like *because* in the speech act domain. The reasoning is in (336):

(336) a. premise: there is a good movie on
b. premise: if there is a good movie on, we could go see it
c. conclusion: we could go see this good movie

What is interesting here is that the connection between the conclusion "we could go see this good movie" and the first premise "there is a good movie on"

is not explicit. The speaker could have chosen to utter a more explicit invitation to go see the movie, as in (337):

(337) We could go see a movie because there is a good movie on.

In contrast, what happens in (330c) is that the first premise (336a) is the reason why the question is asked, implying that if the addressee is free, he could go see the movie with the speaker; the *because*-clause is a justification of *why* the question has been posed. The small exchange in (338) makes all these steps explicit, as does the reasoning in (339):

(338) A: *What are you doing tonight?*
B: *Why do you ask this?*
A: *Because there is a good movie on and we could go see it together.*

(339) a. Premise: You are free tonight.
b. Premise: If you are free tonight, then we could go see a good movie together.
c. Conclusion: We could go see a good movie together.

What is striking (as will be argued in the next section) is that *because*-clauses are the conclusions of reasoning in the epistemic and speech act domains, whereas the antecedent clause is the conclusion in the content domain. The next section will consider the important question of why a *because*-clause is compatible with a conclusion – that is, how a cause of something (in particular, an event) can in fact be the conclusion of reasoning.

5 Causality and argumentation

In this section, I will use the argumentation given in Moeschler (2009, 2014) showing the relation between *causality* and *argumentation*. The point of departure is that one standard means of arguing is to use *because*-clauses, stating either the cause or the reason why something is the case. (340) is an explicit version of the argumentation, with a *because*-clause, whereas (341) is an implicit argumentation, with no explanation relationship:

(340) I do not want to eat broccoli, because I don't like it.

(341) I do not want to eat broccoli; I don't like it.

Coming back to Sweetser's examples, repeated for convenience in (342), it is clear that the speaker could be described as making an argument in (b) and (c), but not in (a):

(342) a. *John came back because he loved her.*
b. *John loved her, because he came back.*
c. *What are you doing tonight, because there's a good movie on.*

In (a), the speaker *explains* why John came back (because he loves her); in (b), the speaker gives a *reason* (John came back) to *conclude* that John loves her; and finally, in (c), the speaker gives a *reason justifying* her question. The principal assumption in this chapter is that *explaining is not arguing*, because *argumentation* consists in giving *reasons* with the purpose of *convincing* our audience (Mercier and Sperber 2017: 198–9):

> We construct arguments when we are trying to convince others or, proactively, when we think we might have to. We evaluate the arguments given by others as a means – imperfect but uniquely useful all the same – of recognizing good ideas and rejecting bad ones. Being sometimes communicators, sometimes audience, we benefit both from producing arguments to present to others and from evaluating the arguments others present to us. Reasoning involves two capacities, that of producing arguments and that of evaluating them. These two capacities are mutually adapted and must have evolved together. Jointly they constitute, we claim, one of the two main functions of reason and the main function of reasoning: the argumentative function.

So, the *main function of reason is argumentation*. This assumption does not mean that giving a reason for believing something or giving a reason which justifies a speech act is equal to arguing. It is instead the most reasonable explanation of the fact that giving reasons or justifying an action is equal to arguing. If this claim makes sense, it might provide an initial intuition on what could be the argumentative uses of *because*-clauses: they are used in the epistemic and the speech act domains. Below, I will concentrate on the epistemic use of *because*, and explain how this use is connected to the content domain use (the speech act domains will not be discussed on this point).[5]

I will begin with a very clear hint at the attribution of argument status to an utterance. According to the theory of linguistic argumentation (*théorie de*

5 In classic analysis of connectives, as in Groupe λ-l (1975) for French causal connectives *car, parce que, puisque*, it is on the contrary the speech act domain which is evaluated as more valuable as regards, for instance, the content domain (belonging to semantics). A parallel analysis is made for the connective *mais* 'but' (Anscombre and Ducrot 1977). We will come back on these issues in chapter 8.

l'argumentation dans la langue, Anscombre and Ducrot 1983), the test for attributing argument status to an utterance is the possible adjunction of a semantic operator like *presque* 'almost' or *même* 'even', respectively conveying positive orientation (in contrast with negative semantic meaning) and argumentative force (the argument introduced by *même* 'even' is the strongest possible). The utterances in (343) are argumentations, as the adjunction of *almost* and *even* gives an argument status to the clauses they introduce. However, the addition of *because* to the *almost*-/*even*-clauses is incompatible with these operators (344) (see Moeschler 2009 for an extensive analysis):

(343) a. Switzerland should not have been eliminated from the EuroFoot Tournament: they *almost* beat Turkey.
b. Switzerland could have won: they *even* beat the best team of the tournament.

(344) a. ? Switzerland should not have been eliminated from the EuroFoot Tournament, because they *almost* beat Turkey.
b. ? Switzerland could have won the EuroFoot Tournament, because they *even* beat the best team of the tournament.

On the other hand, when it is used without *almost* or *even, because* is acceptable, as shown in (345):

(345) a. Switzerland should not have been eliminated from the EuroFoot Tournament, *because* they beat Turkey.
b. Switzerland could have won the EuroFoot, *because* they beat the best team in the tournament.

Any account of these data must recognize that they evidence a conflict between two properties: the argument status of the second clause, made explicit by *almost* and *even* in (343); and the conferring of explanation status to the second clause, made explicit by *because* (345). For the semantic and pragmatic properties of *because* and the properties of the semantic operators like *almost* and *even*, the following analysis can be inferred: (i) *because* introduces a cause or an explanation (in its content domain); (ii) an argumentation is a relationship between an argument and a conclusion. So, if *because* were both causal and argumentative, the two following relationships should be true:

(346) a. CONSEQUENCE *because* CAUSE b. CONCLUSION *because* ARGUMENT

(346a) gives the semantic structure of causal-*because*, whereas (346b) is the structure of an argumentative-*because*; thus, the argumentative *because* introduces an argument. The peculiarity of (344) raises a number of questions: can a cause be an argument? In particular, can an explanation be an argument? In other words, is *explaining* synonymous with *arguing for*? The answer is clearly no, but this answer can only be be justified by a definition of what an explanation is (Blochowiak 2014a); in section 4 of this chapter, this was provided, with explanations defined as answers to *why*-questions. To demonstrate the relationship between explanation and argumentation, I use the following fictitious situation. Suppose that only few of my students pass their pragmatics exam. The explanation that my class is too difficult for BA students could be put forward. The following utterances (347) are appropriate descriptions of this situation:

(347) a. Few of Jacques' students passed their exam. His class is too difficult for BA students.
b. Few of Jacques' students passed their exam *because* his class is too difficult for BA students.
c. Few of Jacques' students passed their exam. Why? Because his class is too difficult for BA students.
d. Why did few of Jacques' students pass their exam? Because his class is too difficult for BA students.

The same distributions occur with French, where *peu* 'few' has been demonstrated to be negatively oriented (Ducrot 1980, Anscombre and Ducrot 1983):

(348) *Peu d'étudiants ont réussi leur examen.*
few students HAVE-3PP passed their exam.
Le cours de Jacques est trop difficile.
The class of Jacques BE-PR too difficult
'Few students passed their exam. Jacques' class is too difficult'.

Now suppose that Peter would like to *prove*, rather than *explain*, that my class is too difficult: his argumentation could not use the explanation given in the previous examples (that the class is too difficult explains why only few of my students passed), because Peter has to use as an *argument* the fact that only few students passed to arrive at the *conclusion* that my class is too difficult. In this situation, expressing this relationship explicitly involves the use of an inferential vs. causal connective – *therefore* in English, and *donc* in French – as in (349) and (350), implying the argumentative relationship given in (351):

(349) Few of Jacques' students passed their exam. *Therefore*, his class is too difficult.

(350) *Peu d'étudiants ont réussi leur examen. Donc son cours est trop difficile.*
few students HAVE-3PP passed their exam. So his class BE-PR too difficult.
'Few of Jacques' students passed their exam. Therefore, his class is too difficult.'

(351) ARGUMENT [*few students passed*] ∧ CONCLUSION [*Jacques' class is too difficult*]

The paradox is that the argumentative relationship in (349) is exactly the same as the explanatory situations given in (346a), because the order of the discourse segments is the same: CONSEQUENCE-CAUSE. The question is thus whether it is possible to change the argumentation in (349) into an utterance containing a *parce que*-clause. This can be done, but the result is surprising, because the relationship in (352) is causal (353) rather than argumentative (354):

(352) Few of Jacques' students passed their exam *because* his class is too difficult.

(353) CONSEQUENCE [few students passed] ∧ CAUSE [Jacques' class is too difficult]

(354) CONCLUSION [few students passed] ∧ ARGUMENT [Jacques' class is too difficult]

Moreover, there is a contradiction between what the argumentative analysis hypothesizes – *because* introduces an argument, as in (354) – and what the semantic analysis predicts – *because* introduces a cause, as in (353). The reason for this contradiction is that *a cause*, whatever its consequence, *cannot be an argument*; a cause entails a consequence in the real world, and not a proposition in an argumentation. By contrast, a cause can be a conclusion, as the *therefore*-relation in (349) shows. A cause introduced by *because* is thus a conclusion rather than an argument. To change a *because*-clause in order to preserve the matching order between the causal order and argumentative order, the order of the discourse segments is inverted, as in (355):

(355) Jacques' class is too difficult for BA students, *because* few students passed their pragmatics exam.

Strangely, (355) confirms the common-sense representation of an argumentation: in (355), *because* introduces an argument ("few students passed their exam") to support a conclusion ("Jacques' class is too difficult"). What the speaker tries to do is to argue for the conclusion that Jacques' class is too difficult, arguing that only a few students passed their exams:

(356) CONCLUSION [Jacques' class is too difficult] ∧ ARGUMENT [few students passed]

The best possible usage, with an acceptable balance between causality and argumentation, has now been attained. This conclusion is unremarkable, as *because* has an epistemic use in (355), translated to a causal analysis in (357):

(357) CAUSE [Jacques' class is too difficult] ∧ CONSEQUENCE [few students passed]

My analysis of causal and argumentative uses of *because* reaches the significant conclusion that argumentations are special cases of causal relationships, albeit substantially modified: argumentative uses of *because,* introducing an argument, are *epistemic* and not causal. As such, it can be tentatively concluded that there are two types of use for *because* which relate to argumentation: (i) an explicative *because*, introducing a cause or a conclusion; and (ii) an epistemic *because,* which introduces a consequence or an argument. Argumentative *because* is *epistemic* and introduces an *argument*, just as predicted by Anscombre and Ducrot's classic theory of argumentation, as well as Sweetser's description of epistemic uses.

What does this excursus in argumentation show about causality? If argumentative uses of a causal connective like *because* are epistemic, it means that the core semantic component of causal relationships is preserved, whatever the order of the clauses. This property corresponds to a *conservative* relationship, defined as follows (Moeschler 2014):

> *Conservative relationship*
>
> A relationship *R* is conservative if, and only if, *R* succeeds in imposing the preservation of the conceptual relationship between propositional representations, despite procedural instructions carried by linguistic markers.

Unlike temporal relationships, which can be defeated by connectives and contextual assumptions through pragmatic accommodation (see chapter 4, and Moeschler 2002a), causality requires to accommodate the causal order; non-iconic causal order (content domain) becomes a more transparent iconic order in its epistemic and argumentative uses. This will be demonstrated formally and distributionally in chapter 6.

6 Conclusion

This chapter's primary aim was to propose a general model for causality: causal relations between events and states are contiguous, asymmetrical and contingent, and also general and dependent on *ceteris paribus* conditions. This model, where causal relationships are forward-oriented, contrasts with the manner in which causality is expressed in discourse.

First, we demonstrated that causality is a non-iconic relation between events, and when the relation is iconic, the use of the causal connective belongs not to the content domain (real-world relations between events) but to the epistemic or speech act domains. Whereas the epistemic domain refers to the way in which a conclusion can be drawn from a premise or an argument (introduced by a causal connective like *because*), the speech act domain refers to the way linguistic actions such as illocutionary acts can be made relevant or more acceptable by a justification expressing the reason why the speech act has been uttered.

Second, three arguments for the non-iconic order in causality have be discussed: (i) the typological argument that causal clauses prefer final over initial position, the well-known exception being Japanese (see de Brot 2019 for an investigation into causal connectives in Japanese and the cause-consequence order); (ii) the discourse argument that explanation is the opposite discourse relation of narration; and (iii) the cognitive argument that processing of the non-iconic order is facilitated with weakly associated propositions.

Finally, this chapter demonstrated that the relation between causality and argumentation – exemplified by the pervasive use of causal connectives like *because* in argumentations – is constrained by the epistemic use of the connective, where there is harmony between the argumentation relations (*because* introduces an argument) and the causal property of the discourse segments (the *because*-clause is a consequence).

The last issue regarding causality, which will be the topic of chapter 6, is to explain why and how causal connectives in natural language are bearers of a

CAUSE concept. It is crucial to explain this, mainly because inferential connectives (such as *so*, *therefore*, *thus* and *hence*) and temporal connectives (like *and* and *then*) can express causal relations, too. The main objective of chapter 6 is to show what type of semantic content – conceptual and/or procedural – is encoded by such connectives.

6 Causal connectives, conceptual and procedural meanings

1 Introduction

In chapter 5, I argued – and hopefully demonstrated – that causality in natural language is a backward relation. The arguments given were typological, discursive and cognitive. I also argued that when a causal connective is used in a domain other than the content domain (the epistemic and speech act domains), its usages are argumentative, and its main function is to introduce an argument which cannot be interpreted as a cause. What is now needed is a sound description of causal connectives.

I will limit my attention to the case of the French causal connective *parce que* 'because'. I will not provide a comparative analysis where it is opposed to *puisque* 'since' and *car* 'for', mainly because these connectives have been analysed fairly intensely in French (Groupe λ-l 1975; Zufferey 2010, 2012; Degand and Fagard 2012; Jivanyan 2015; Jivanyan 2019; Jivanyan and Samo 2017, a.o.), nor will I provide a cross-linguistic analysis (Stukker and Sanders 2012; Zufferey and Cartoni 2012; Zufferey 2016); last but not least, I will not consider descriptions of causal connectives in other languages, such as Dutch (see for instance Stukker, Sanders, and Verhagen 2009) or Greek (Chrysovalantis 2012, 2014). Instead I will adopt another strategy of analysis, based on semantic constraints (aspectual classes) and the cause-consequence order. This final part of my analysis is a comparison between causal connectives, like *parce que*, and inferential and temporal connectives, like *donc* 'therefore' and *et* 'and'. The main outcome of my comparative description will focus not on the differences in meaning, but on what these connectives share in their uses. This strategy will lead to a surprising conclusion: what distinguishes these connectives, and therefore their meaning, is mainly located at the same level as causal meaning, the CAUSE relation. As such, I will capitalize on the outcomes from chapter 2 in the semantic and pragmatic analysis of these connectives.

To obtain these results, section 2 will begin with an aspectual analysis of causal, inferential and temporal relations. Section 3 will apply the results of this initial analysis to causal, inferential and temporal connectives, seeking to establish which aspectual constraints causal meaning places on connectives. Combining order between discourse segments (iconic and non-iconic), I will propose a comparative analysis of three connectives – *parce que* 'because', *donc* 'therefore' and *et* 'and' – which will serve as the starting point for section 4, which asks why causal connectives are backward. Finally, section 5 will

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interpret these outcomes in terms of conceptual and procedural meaning; the big picture will be given in section 6. My intention is to confirm the mixed conceptual-procedural model, and propose a new analysis of causal, inferential and temporal connectives.

2 Causal relations between states and events

Chapter 5 defined causality as a relation between events and/or states. In this section, this definition will be given further weight by establishing which kinds of combinations of event and state correspond to a given causal relation. The analysis will be limited to the opposition in aspectual classes between states and events, and will not take into account a finer analysis – for example, one integrating aspectual differences between states, activities, accomplishments and achievements. The category of *event* will be inclusive here, encompassing *activities, accomplishments* and *achievements*. The first type of combination is between aspectual classes: a causal relation can hold between state-state, state-event, event-event, and event-state. Adding in the two orders of the discourse segments (CAUSE-CONSEQUENCE, CONSEQUENCE-CAUSE) gives 8 possible discourses, as shown in Table 34:

Table 34: Combination of event/state and cause/consequence.

	CAUSE-CONSEQUENCE	CONSEQUENCE-CAUSE
state-state	*Mary is a minor; she cannot drink alcohol*	*Mary cannot drink alcohol; she is a minor*
state-event	*Axel is sick; the doctor is treating him*	*The doctor is treating Axel; he is sick*
event-event	*Mary pushed John; he fell*	*John fell; Mary pushed him*
event-state	*Mary ate too much; she is sick*	*Mary is sick; she ate too much*

In these data, a state can be a cause: a state-event relation represents a classic indirect causality configuration, whereas the state-state relation is more abstract, based on a law or a rule, as in (358), which is possible thanks to the geometric rule in (359) (Blochowiak 2014a):

(358) *This geometric form is a triangle; the sum of its angles is equal to 180°.*

(359) In a triangle, the sum of its angles is equal to 180°.

So, when a state is presented as a cause in a backward relation, it explains the state, described as a consequence. From a strict semantic point of view, there is no causal relation between these states (the state does not cause a new state in the real world as a consequence), but a relation of explanation. When the state is the trigger in Table 34, the relations are as in (360b) and (361b), rather than in (360c) and (361c):

(360) a. *Mary cannot drink alcohol; she is a minor.*
b. Mary is a minor EXPLAINS Mary cannot drink alcohol
c. Mary is a minor CAUSES Mary cannot drink alcohol

(361) a. *The doctor is treating Axel; he is sick*
b. Axel is sick EXPLAINS the doctor is treating Axel
c. Axel is sick CAUSES the doctor is treating Axel

On the other hand, there is a causal – rather than explanation – relation when the cause is an event; this means that if an event A explains another event B, it must be because there is a causal relation between them. In the example of (362a), the causal relation in (362b) is necessary to obtain the explanation relation. I propose that the causal relation between an event and an event/state is the semantic meaning of the utterance, whereas (362c), spelling out the explanation relation, is its pragmatic meaning, spelled out yet more clearly in (362d):

(362) a. *John fell; Mary pushed him.*
b. Mary pushed John CAUSES John fell
c. Mary pushed John EXPLAINS John fell
d. By saying *Mary pushed John*, the speaker EXPLAINS why John fell.

With the *iconic order*, we face a similar issue: when the cause is an event, it has a consequence in the real world, and – as proposed for the non-iconic order – the causal relation is direct. In the case of the *eating too much-being sick* relation, it is possible to imagine that there is no intervening event (as Mary ran barefoot in the snow) causally connecting the cause-event and its consequence-state; the *push-fall* case presents a strict Humean definition of causality, since the two events are contiguous, as described in chapter 5. When the cause is a state, the implication for the cause-consequence relation is that a state does not have any causal power and cannot create a new event. So, in (363) and (364), there must be either a set of contextual information in a causal chain (365) to explain that the state is the trigger of a causal relation, or – as in the non-iconic order – a law explaining the relation between states (366):

(363) *Axel is sick; the doctor is treating him.*

(364) *Mary is a minor; she cannot drink alcohol.*

(365) Axel is sick – Axel's mother calls the doctor – the doctor comes home – the doctor treats Axel

(366) A minor cannot drink alcohol

What (363) shows is that the causal chain makes the event and the state discontiguous, and therefore the causality is indirect; in (364), a social law connects a state and an interdiction, which is not the result of a causal connection. Unlike the iconic order in (360a) – *Mary cannot drink alcohol; she is a minor* – there is not an explanation relation, but an inferential one, shown in (367), according to the social law (366):

(367) Mary is a minor IMPLIES Mary cannot drink alcohol

The tentative conclusion is that there is no causal relation between a state and a state, whatever the relation: in the non-iconic order, the relation is explanation, and in the iconic order, inference. When the cause is a state and the consequence an event, the causal relation entails a causal chain, and is in the real world, albeit indirect. Finally, when the cause is an event, whatever the order, the causality is obligatorily direct. But what happens when the relation is marked by a connective? This is the topic of section 3.

3 Causal, inferential and temporal connectives usages in states/events relations

Eight theoretical relations between events and states have been discussed, in both iconic (CAUSE-CONSEQUENCE) and non-iconic (CONSEQUENCE-CAUSE) orders. Testing three connectives – the causal *parce que* 'because', the inferential *donc* 'therefore', and the temporal *et* 'and' – in both orders, this gives 24 possible discourses by combinatory calculus (eight aspectual combinations × three connectives). Tables 35 to 37 illustrate the possible combinations with *parce que, donc* and *et*.[1]

1 For sake of simplicity, the examples will be given in English, connected with a French connective. See Moeschler (2011) for an explicit demonstration with French examples.

Table 35: Iconic and non-iconic order with *parce que*.

	CAUSE-CONSEQUENCE	CONSEQUENCE-CAUSE
state-state	*Mary is a minor,* parce que *she cannot drink alcohol*	*Mary cannot drink alcohol* parce que *she is a minor*
state-event	*Axel is sick,* parce que *the doctor is treating him*	*The doctor is treating Axel* parce que *he is sick*
event-event	*Mary pushed John,* parce que *he fell*	*John fell* parce que *Mary pushed him*
event-state	*Mary ate too much,* parce que *she is sick*	*Mary is sick* parce que *she ate too much*

In Table 35, non-iconic order gives rise to the standard *content* reading – that is, the causal use – of *parce que*, whereas the iconic order corresponds to its inferential or *epistemic* use. In these cases, the CAUSE-CONSEQUENCE order in the real world is conserved where the cause is eventive; when the cause is a state, either a causal law or a causal chain is required. It is worth noting that, at least in French, the iconic use of *parce que* is subject to different acceptability judgements and is often assessed as unacceptable.

The first of the inferential and temporal connectives I will consider is *donc*.

Table 36: Iconic and non-iconic order with *donc*.

	CAUSE-CONSEQUENCE	CONSEQUENCE-CAUSE
state-state	*Mary is a minor,* donc *she cannot drink alcohol*	*Mary cannot drink alcohol,* donc *she is a minor*
state-event	*Axel is sick,* donc *the doctor is treating him*	*The doctor is treating Axel,* donc *he is sick*
event-event	*# Mary pushed John,* donc *he fell*	*John fell,* donc *Mary pushed him*
event-state	*# Mary ate too much,* donc *she is sick*	*Mary is sick,* donc *she ate too much*

Two observations have to be made: first, and somewhat surprisingly, the non-iconic order with *donc* makes all these combinations possible; second, the iconic order has a strange result when the cause is an event. These two observations must be explained; as the reader will discover, these findings are neither trivial nor expected.

First, the non-iconic order can be explained in the same way as the epistemic usage of *parce que*; these non-iconic usages of *donc* are the mirror image of the epistemic iconic order with *parce que*. For instance, with the state-state

iconic relation, an inference is drawn between a fact ("Mary cannot drink alcohol") and the reason for this fact ("Mary is a minor"). So, the shortcut description of the CONSEQUENCE-CAUSE order is just an easy way to describe the kind of reasoning which has to occur. A fact must be explained, but the QUD (Question Under Discussion, Roberts 2004) for the inferential use of *donc* (368) is not a *why*-question, as in (369); in such a case, another connective answering the *why*-question (*parce que*) would have been chosen, as in (370).

(368) *Mary cannot drink alcohol,* donc *she is a minor*.

(369) QUD: Why cannot Mary drink alcohol?
ANSWER: Because she is a minor.

(370) *Mary cannot drink alcohol* parce que *she is a minor*.

(368) must then answer a QUD not about the cause but the reason for a fact, as in (371). The inference from consequence to cause is then just a means of finding the reason for a state of affairs:

(371) QUD: What is the reason for the fact that Mary cannot drink alcohol?
ANSWER: The reason is that Mary is a minor.

Basically, *donc* is inferentially used in the non-iconic order to provide a reason for a fact, realized either as a state or an event, making a shortcut in reasoning from consequence to cause. Figure 23 shows the kind of complex reasoning between these eventualities:

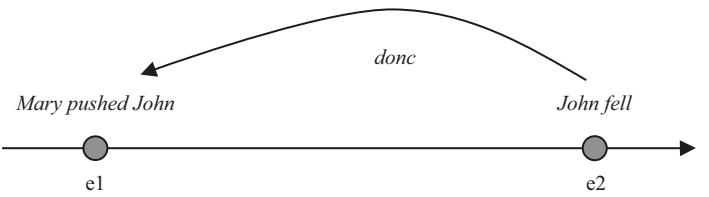

Figure 23: reasoning with *donc* in the non-iconic order (event-event relation).

Second, in the iconic order, when the cause is an event, the consequence with *donc* is not ensured. For instance, it could be the case that the consequence is not that which is inferred by the speaker. Critically, *donc* does not ensure the truth of the consequence when its premise is an event. Examples (372) and

(373) show that the consequence can be defeated, contrasting with the cancellation of the consequence of a state:

(372) *Mary pushed John, but he did not fall.*

(373) *Mary ate too much, but she is not sick.*

(374) # *Mary is a minor, but she can drink alcohol.*

(375) # *Axel is sick, but the doctor is not treating him.*

The cancellation of the consequence in (372) and (373) is not surprising; unlike *parce que, donc* is not a factive connective, and does not entail the truth of the consequence in its iconic order, as we will see. This can be predicted, as the connective is followed by the result of an inference (that is, the conclusion of the speaker's reasoning). This reasoning is based on a premise which, *ceteris paribus*, should yield the right result, as (376) shows:

(376) a. premise: Mary pushed John
b. premise: if Mary pushes John, then he falls
c. conclusion: John fell

Several points can render this conclusion false. First, the apparent deductive reasoning in (376) is not true, mainly because the conclusion (c) is the result not of a deductive rule (here, the *modus ponendo ponens*) but of a conventional implicature, triggered by the connective *donc*. However, this proposal is not consistent with one central property of conventional implicature, which is that it cannot be cancelled; as such, the cancellation of the conclusion cannot be the result of a conventional implicature.

Second, the consequence is a result of a physical law in the real world: when *x* pushes *y*, normally *y* falls. This rule can be broken when certain conditions are not met (for instance, the push is not strong enough; John is very well-built, and cannot be toppled by a push from Mary, etc.). But this explanation resembles the kind of defeasible *modus ponens* (Asher 1993), an explanation which does not take into account the meaning of the connective.

Third, the final possible answer is the semantics of the connective *donc*. As an inferential connective, it does not ensure that the causal relation has a true consequence. This is not surprising given the type of use made possible by such a connective; by using *donc* 'therefore', the speaker puts to her addressee a conclusion to which she is committed, but which could be false. This can be

contrasted with its non-iconic usages, introducing a cause which makes the truth of its discourse segment more certain because the cause is the result not of an inference, but a premise presumed true. Indeed, the antecedent of a conditional cannot be inferred, and only its falsity can be inferred by *modus tollendo ponens* (377):

(377) a. Premise: not-Q
b. Premise: if P, then Q
c. Conclusion: not-P

The final possible uses in both orders are with the connective *et* 'and', which has temporal and/or causal usages in the iconic order, as Table 37 shows:

Table 37: Iconic and non-iconic use of *et* 'and'.

	CAUSE-CONSEQUENCE	CONSEQUENCE-CAUSE
state-state	*# Mary is a minor* et *she cannot drink alcohol*	*# Mary cannot drink alcohol* et *she is a minor*
state-event	*# Axel is sick* et *the doctor is treating him*	*# The doctor is treating Axel* et *he is sick*
event-event	*Mary pushed John* et *he fell*	*# John fell* et *Mary pushed him*
event-state	*Mary ate too much* et *she is sick*	*# Mary is sick* et *she ate too much*

The results are here dramatically constrained. First, *et* 'and' cannot connect the segments in the CONSEQUENCE-CAUSE, non-iconic, order. When the cause is a state, the adjunction of *et* seems not so much redundant as irrelevant, because the segment introduced by *et* is a reason for the act uttered as the first conjunct. This oddity can mainly be explained as a mismatch between the processing of the discourse segment and the instruction of the connective (see section 5, where this is confirmed). When the cause is an event, there is a genuine mismatch between the real world inference from the first to the second segment and the property of the connective. The only possible interpretation is based on a convergent instruction from tense and connective; however, this leads to another – iconic – interpretation, as in (378).

(378) *Jean tomba et Marie le poussa.*
John fall-PS and Mary PRO-3PP push-PS
'John fell and Mary pushed him.'

Second, in the iconic order, the result for *et* 'and' is the opposite of *donc* 'therefore'; the *and*-connection is not acceptable when the cause is a state, and only acceptable when the cause is an event. The explanation is that the connective cannot impose a causal relation by itself: this must be available from the semantic properties of the discourse and/or specific available contextual information. As for the unacceptability of *et* 'and' when the first segment is a cause (a state), the main issue is why such a connective (which makes sense when it contributes to the inference of temporal meaningwith an event-cause) is not a contribution to any type of meaning: the answer is that the audience would be required to make unjustified inferences, neither adding information nor strengthening any previous anticipatory inferences (such as "if Mary is a minor, then she cannot drink alcohol"). So, the provisory conclusion for these observations is that a connective must bring a real contribution to processing; it must not impose superfluous processing costs.

I would now like to discuss one type of example belonging to the non-iconic order in the event-event relation. In a famous contribution to the pragmatics of time, Wilson and Sperber (1998) gave examples in which *and* is incompatible with the non-iconic order (379), contrasting with the possible non-iconic interpretation without connectives (380) (Wilson and Sperber 2012: 174):

(379) a. *The glass broke and John dropped it.*
b. *I hit Bill and he insulted me.*
c. *I got caught and my best friend betrayed me.*

(380) a. *The glass broke. John dropped it.*
b. *I hit Bill. He insulted me.*
c. *I got caught. My best friend betrayed me.*

Here is their comment: "Notice, by the way, that there is one of the few cases where an interpretation possible for a non-conjoined utterance [non-iconic] is generally not available for its conjoined counterpart. An adequate account of temporal and causal connotations should explain why the reverse-causal [non-iconic] interpretation of [380] is not available for [379]." In the same chapter, Wilson and Sperber give another analysis of this non-iconic order with *and*, using examples like (381) and (382) (the same as (379c), but with a comma before *and*):

(381) a. Peter: *Did John break the glass?*
b. Mary: *Well, the glass broke, and John dropped it.*

(382) *I got caught, and my best friend betrayed me*.

Their comment is straightforward (Wilson and Sperber 2012: 185): "Here, Mary clearly *implicates* that the glass broke because John dropped it" (emphasis is mine). In the same vein, they claim that "[382] might well convey that the speaker got caught *because* her best friend betrayed her". So, the causal meaning – that is, the backward non-iconic reading – is an *implicature*. In addition, the backward reading in Table 37 is possible *with a comma*, and this is only possible with an event, rather than a state, as a cause:

(383) a. # *Mary cannot drink alcohol, and she is a minor*.
b. # *The doctor is treating Axel, and he is sick*.
c. *John fell, and Mary pushed him*.
d. *Mary is sick, and she ate too much*.

The explanation above also works for state-cause: *and* gives rise to a superfluous inference that has nothing to do with a causal explanation, and its use is thus not expected.

4 Why causal connectives are backward

The analysis here has yet to provide a complete understanding of what is allowed and what is ruled out with connectives in the CAUSE-CONSEQUENCE and CONSEQUENCE-CAUSE orders, when combined with aspectual combinations. I propose that a comparison of meaning must be undertaken to establish the difference between these connectives, in order to fill this gap. Up to now, I have made a superficial distinction between connectives' usages, based on the order between what can be a cause and what can be a consequence. I would now like to propose a more abstract contrast between *causal reading* and *inferential reading*. The causal reading with *parce que* has the non-iconic order CONSEQUENCE-CAUSE, whereas the inferential *parce que* is the iconic order (CAUSE-CONSEQUENCE). This order is exactly what happens in the causal reading for *donc* and *et*, as Table 38 shows.

With this analysis, the picture becomes somewhat clearer. First, in the *iconic* order (CAUSE-CONSEQUENCE), the inferential (*donc* 'therefore') and temporal (*et* 'and') connectives are in complementary distribution. *Donc*, as an inferential connective, is specialized for a causal relation when the cause is realized by a state, whereas *et* is specialized for an eventive causal relation. As argued above, this makes sense: *et* 'and' triggers a causal and temporal implicature because of the maxim of manner ("Be orderly", Grice 1975: 46); with *donc*, where

the relation is an inference from a state, either a causal law or a causal chain is required. As for *parce que*, when the reading is inferential – in the CAUSE-CONSEQUENCE reading – the acceptability of the discourse is based on reasoning: the truth of the consequence is an argument for the truth of the cause (so, for believing the truth of the cause). Figure 24 shows this inferential movement:

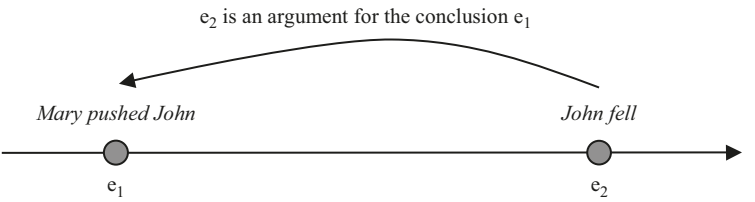

Figure 24: Reasoning with *parce que* in the iconic order (event-event relation).

When the cause is a state, there is reference either to a causal chain supporting the CAUSE-CONSEQUENCE relation (*Axel is sick*, parce que *the doctor is treating him*) (see Figure 25), or a causal law (a minor cannot drink alcohol).

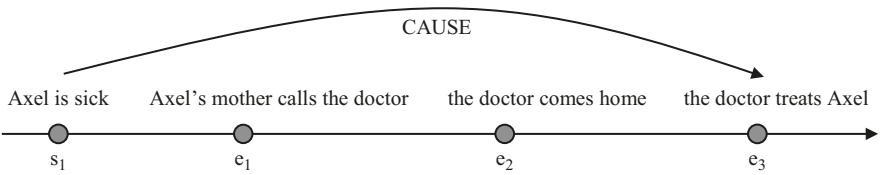

Figure 25: A causal chain for a state-event causal relation.

However, in the iconic order these examples are duplicates of the causal iconic relation with the fronted connective, as in (384):

(384) a. Parce que *Mary is a minor, she cannot drink alcohol.*
b. Parce que *Axel is sick, the doctor is treating him.*
c. Parce que *Mary pushed John, he fell.*
d. Parce que *Mary ate too much, she is sick.*

So why choose a discourse structure that rules out the content domain order (the CONSEQUENCE-CAUSE or non-iconic order)? The answer is that (384) gives examples where the cause is presupposed, and thus old or given information. The choice between (384) and the inferential use of *parce que* depends, then, on the

informational status of the cause: when the cause is given, a fronted causal connective is the best choice; when it is new information, the cause is fronted, and what is presupposed (i.e. given) is the consequence. This explains why the cause has to be inferred in the iconic order or inferential use of *parce que*, on the basis of the acceptable truth of the consequence.

(385) a. *Mary is a minor,* parce que *she cannot drink alcohol.*
b. *Axel is sick,* parce que *the doctor is treating him.*
c. *Mary pushed John,* parce que *he fell.*
d. *Mary ate too much,* parce que *she is sick.*

I have yet to account for the unexpected order for the inferential and temporal (non-iconic) orders in (386) and (387), corresponding to (383):

(386) a. *Mary cannot drink alcohol,* donc *she is a minor.*
b. *The doctor is treating Axel,* donc *he is sick.*
c. *John fell,* donc *Mary pushed him.*
d. *Mary is sick,* donc *she ate too much.*

(387) a. *# Mary cannot drink alcohol,* et *she is a minor.*
b. *# The doctor is treating Axel,* et *he is sick.*
c. *John fell,* et *Mary pushed him.*
d. *Mary is sick,* et *she ate too much.*

Donc is thus a perfect inferential connective. Somewhat counter-intuitively, inferential readings are expected from *donc*, rather than its causal meaning. Contrast (386) with the *donc*-using iconic order, repeated in (388); the iconic order only yields a positive result in 50%, rather than 100%, of cases.

(388) a. *Mary is a minor* donc *she cannot drink alcohol.*
b. *Axel is sick* donc *the doctor is treating him.*
c. *# Mary pushed John* donc *he fell.*
d. *# Mary ate too much* donc *she is sick.*

Obviously, the causal reading with the iconic order is not what *donc* intends to create. Where the causal-content reading for *parce que* can be described as its *basic* meaning, causal iconic meaning for *donc* is a second-order type of meaning, as its basic meaning is inferential. Table 38 can now be presented as a full picture, including the non-iconic order for *donc* and *et*.

Table 38: An initial analysis of causal and inferential usages of connectives *parce que, donc* and *et*.

type of order	CONSEQUENCE-CAUSE	CAUSE-CONSEQUENCE		
type of readings	causal	inferential	causal	
connectives	*parce que*	*parce que*	*donc*	*et*
event-event	+	+	–	+
event-state	+	+	–	+
state-state	+	+	+	–
state-event	+	+	+	–

The first conclusion from these findings is that the causal readings (in both non-iconic and iconic readings) straightforwardly answer the issue of causal connectives: only *parce que* ensures a causal reading regardless of aspectual combination. With inferential (*donc*) and temporal (*et*) connectives, two connectives are necessary, appearing in complementary distribution. The second conclusion relates to inferential readings: *parce que* and *donc* are in competition, because they both ensure an inferential reading for all types of aspectual combination. With *et*, only two of four possibilities occur, and these are argued above to be borderline usages. However, assuming that the inferential use of *donc* is basic, the inferential or epistemic use of *parce que* has been shown to be a first-order usage, as it leads to an abductive reasoning which infers the conclusion (the cause) from the argument (the consequence). Thirdly and finally, as the iconic order is a higher order type of meaning for *parce que*, its non-iconic uses are basic. *Parce que* is thus *the only causal connective to ensure a causal reading for any type of aspectual combination*: the trade-off is that this is only possible with a non-iconic order.

I have already provided substantial evidence (chapter 5) in favour of this third conclusion: the typological argument that natural languages prefer the causal clause to appear in final position; the discourse argument that the explanation relation is an alternative, at the discourse level, to narration; and the cognitive argument that there is a preference for the non-iconic order when processing causal relations. Factoring in connectives from a purely descriptive perspective, I have demonstrated here that the distribution of the causal connective *parce que* 'because' matches all of the properties we assigned to causality. The final challenge is to add to this surface description a more robust proposal, based on the semantics and the pragmatics of connectives, which is the topic of the next section.

5 Conceptual and procedural meanings in connectives

The final step is to create an analysis of connectives which is compatible with their behaviour and our description of the different types of meaning. In particular, two questions will be posed: first, what type of meaning – procedural or conceptual – is encoded in connectives? Second, what type of meaning relation (entailment, presupposition, explicature or implicature) corresponds to conceptual and procedural meaning? As argued in chapter 2, the originality of this book's proposal is that it combines the conceptual/procedural issue with a more classic approach to meaning in pragmatics, making reference to concepts such as entailment, presupposition, explicature and implicature.

5.1 parce que

In the content domain, *parce que* delivers a certain amount of information about the semantic and pragmatic status of its conjoined clause. First, as stated in chapter 2, *because* has been described in Blakemore (1987: 43) as referring to a concept:

(389) *Because-elimination*
Input: *P because Q*
Output: (a) P
(b) Q
(c) Q is the cause of P

This description gives the following information: *P* and *Q* are entailed, *Q* is the cause, and *P* is the consequence. But this description implies that the causal relation should be an entailment, too (as in Blakemore 1987). The main problem is that the behaviour of *parce que* under negation should make the causal entailment either true or false, but in the content domain, only the cause is negated, and the causal relation itself is not.

(390) a. *John did not fall* parce que *Mary pushed him, but because he tripped on a root*.
b. entailment: CAUSE [*John tripped on a root, John fell*]

In some proposals (Sanders and Noordman 2000), the causal relation has been analysed as presupposing an additive relation[2]: *P and Q* is presupposed by *P because Q*. This proposal for the content domain can be represented in (391):

(391) *A presuppositional description of P parce que Q*
a. entailment: P, Q
b. presupposition: P and Q

One of the big problems this analysis encounters is that, if the additive relation is a presupposition, it must be *backgrounded*. This is a somewhat weird proposal, as it might be possible only in cases where the cause already belongs to the common ground; but as the cause is generally a new piece of information (bearing in mind the "subject first, focus last" law, Jackendoff 2002), the givenness of the cause is only possible with the fronted position of the causal connective and the cause — that is, with *because Q, P*.

If the causal relation is thus neither an *entailment* nor a *presupposition*, many pragmatic analyses (Wilson and Sperber 1998; Carston 2002 a.o.) argue that it must be an *implicature*. If it is a *conventional* implicature, it is not cancellable – and it *is* in (390) – nor a generalized conversational implicature; in this case, the causal meaning is non-truth-conditional. However, one property of the causal reading is its truth-conditionality. For instance, applying the *but*-test makes the causal connection with *parce que* meaningless:

(392) # *John fell* parce que *Mary pushed him, but there is no cause-effect relation between these two events*.

So, if the causal relation can be neither an entailment, a presupposition, a conventional implicature nor a conversational implicature, it MUST be an *explicature*: a truth-conditional and pragmatic meaning. This type of meaning is compatible with the property of negation as described in chapter 1, since negation can deny the specific causal relation between a cause and a consequence, implying that another causal relation holds:

2 "For instance, in a cognitive account of coherence relations (Sanders et al., 1992, 1993) causal relations presuppose additive relations" (Sanders and Noordman 2000: 39).

(393) a. *Jacques did not attend the conference because he had a paper to read* (*but because he was invited*).
b. NOT [*Jacques had a paper to read* CAUSE *Jacques attend the conference*] ∧ [*Jacques was invited* CAUSE *Jacques attend the conference*]

Of course, when negation scopes over the matrix clause, the causal relation is out of the scope of negation, as will be shown:

(394) a. *Jacques did not attend the conference, because he was sick.*
b. [*Jacques was sick*] EXPLAINS WHY [NOT [*Jacques attended the conference*]]

In the content domain, the causal connective therefore (i) entails the consequence and the cause, and (ii) raises the causal relation to the level of explicature.

Further important questions have to be asked: (i) Which type of content is the explicature, conceptual or procedural? (ii) How can the (backward) orientation of the causal connection be described, since – in the epistemic domain – the direction is iconic (forward) rather than non-iconic (backward)? The answer to the first question is straightforward: the explicature is the result of the conceptual meaning of *parce que*, combined with its procedural meaning; the procedural meaning *of parce que* in the content domain is the backward relation between the cause and its consequence. So, the first complete analysis of the meaning of the connective *parce que* is given in (395):

(395) *A complete analysis of parce que in the content domain: P parce que Q*
a. conceptual meaning
1. entailments P, Q
2. explicature X CAUSE Y
b. procedural meaning Q CAUSE P

The remaining question is how this analysis is compatible with the *inferential* use of *parce que*, as well as its *speech act* use, repeated here in (396) and (397):

(396) *Mary pushed John*, parce que *he fell.*

(397) *Did Mary push John?* Parce que *he fell.*

In both cases, the conceptual relation is the same as in the content domain. In order for (396) and (397) to make sense, the causal relation between pushing and falling is still necessary, even if the proper reading is given in (398) and (399):

(398) *Epistemic (inferential) reading*
John's falling is the reason for the speaker's belief that Mary pushed John.

(399) *Speech act reading*
John's falling is the justification for the speaker's asking whether Mary pushed John.

But in this case, the direction of the causal relation is forward, as in (400):

(400) Forward causal relation
Mary pushed John CAUSE *John fell*

So, the complete analyses for the epistemic and the speech act domains are given in (401) and (402) respectively:

(401) *A complete analysis of parce que in the epistemic domain*
P, parce que Q
a. conceptual meaning
1. entailments P, Q
2. explicature X CAUSE Y
b. procedural meaning P CAUSE Q

(402) *A complete analysis of parce que in the speech act domain*
P? Parce que Q
a. conceptual meaning
1. entailments P, Q
2. explicature X CAUSE Y
b. procedural meaning Q CAUSE asking whether P

The final question is how it is possible to derive from the forward causal relation the *reason* and *justification* readings of epistemic and speech act *parce que*. The proposed inferential schema is that the causal relation between the pushing and the falling events is a backgrounded assumption, which allows the cause to be inferred (403d):

(403) Inferring the epistemic reading from *Mary pushed John*, parce que *he fell*
a. Premise Mary pushed John
b. Background knowledge If Mary pushed John, John fell
c. Conclusion John fell

d. Inference — John fell is a reason for believing that Mary pushed John

So, in the epistemic use, cause and conclusion are not entailed; only consequence is. As a result, the strong semantic meaning triggered by *parce que* is such that only the proposition it introduces is warranted truth-conditionally. In the content domain, the consequence is inferred by a simple *modus ponens*, as in (404) (see Blochowiak 2014a for a similar analysis):

(404) *Inferring the consequence from the cause*

a. Premise — Mary pushed John
b. Background knowledge — If Mary pushed John, John fell
c. Conclusion — John fell

The same reasoning occurs for the speech act reading:

(405) *Inferring the speech act reading from Did Mary push John*? Parce que *he fell*

a. Premise — Mary pushed John
b. Background knowledge — If Mary pushed John, John fell
c. Conclusion — John fell
d. Inference — John fell is a justification for asking whether Mary pushed John

The resulting general template for the three usages of *parce que* is given in (406):

(406) *A complete analysis of P parce que Q*

a. conceptual meaning
   1. entailments — Q
   2. explicature — X CAUSE Y
b. procedural meaning
   1. content domain — Q CAUSE P
   2. epistemic domain — P CAUSE Q
   3. speech act domain — Q CAUSE asking whether P

The principal conclusion of this analysis is that the type of reading is the result of an inference. The simplest case is predictably the *content domain* reading, because a *modus ponens* triggers the appropriate reading. As for the epistemic and speech act readings, they all use the same premises and conclusions, but

either to allow the inference of the cause (epistemic reading) or to ask whether the cause is true. What seem to be odd usages (epistemic) or strange usages (speech act) can be explained from a cognitive perspective. First, works on the acquisition of causal connectives (Zufferey 2010, 2015; van Veen 2011) have observed that speech act usages are among the first usages by children, often described as concomitant with content usages. It has also been noted that epistemic usages appear later in the causal domain. The kind of reasoning for speech act uses is easy to grasp: a justification gives a reason for an action, here a speech act; for instance, demands and requests are frequent speech acts used by children (see Zufferey 2015: 48 for a survey of experimental works). Van Veen (2011: 123) gives such an example (407):

(407) (Nina, 2;11;12/ Situation: playing 'doctor' with a doll)
Nina: *Would you take her diaper off from a little bit,* ***because*** *I'm the doctor?*
Mother: *Okay*.

In other words, the speech act reading only requires what Zufferey (2010) calls a *metacommunicative* ability, developed earlier than the *metacognitive* one implied in the epistemic domain. The epistemic reading consists in inferring the cause from the consequence – that is, using the proposition introduced by the causal connective as a reason to believe that it has been caused by the proposition introduced in the givenness position. The inferential or epistemic use of a causal connective using an iconic order is thus a complex usage. In these conditions, there should be a better solution; but as Table 39 shows, the alternative inferential solution is not iconic. This puzzle, yet to solve, is the topic of the next section.

Table 39: A complete analysis for causal, inferential and temporal connectives.

reading	**causal**			**inferential**		
order	**non-iconic**	**iconic**		**iconic**	**non-iconic**	
connective	***parce que***	***donc***	***et***	***parce que***	***donc***	***et***
event-event	+	–	+	+	+	+
event-state	+	–	+	+	+	+
state-state	+	+	–	+	+	–
state-event	+	+	–	+	+	–

5.2 *donc*

The result of *donc* distribution is straightforward: in the iconic order, only a stative cause is responsible for a causal reading, whereas in the non-iconic order, in the inferential use, all possible aspectual combinations are allowed. As the causal reading has already been discussed, what must now be explained is how *donc* is possible with the non-iconic order. At first glance, the inferential uses of *donc* structurally resemble the non-iconic causal (content) reading of *parce que*. Consider the following simple comparison, in the eventive causal cases:

(408) a. *John fell,* donc *Mary pushed him.*
b. *Mary is sick,* donc *she ate too much.*

(409) a. *John fell* parce que *Mary pushed him.*
b. *Mary is sick* parce que *she ate too much*

In the *parce que* usages (409), as seen in the previous section, the consequence is the result of a simple inference rule (i.e. the *modus ponendo ponens*). Referring to the semantics of *parce que* given in (406), the causal reading is obtained as follows:

(410) *A complete analysis of John fell parce que Mary pushed him*

a. conceptual meaning		
1. entailments	John fell Mary pushed John
2. explicature	X CAUSE Y
b. procedural meaning		
content domain	Mary pushed John CAUSE John fell
c. causal interpretation	John fell IS THE CONSEQUENCE OF Mary pushed John

As I have argued, this reading is obtained by the conceptual and procedural meanings of *parce que*, and an inference by way of a *modus ponendo ponens*. If there is a reading triggered by an inferential connective in the non-iconic order, then the procedure of interpretation should be totally different. To establish what this procedure might be, it must be established which QUDs discourses like (408a) and (408b) respond to, as argued above. In the causal reading of *parce que*, (409a) answers (411):

(411) Peter: *Why did John fall?*
Lynn: *John fell because Mary pushed him.*

However, (408a) does not answer this question, as shown in (412):

(412) Peter: *Why did John fall?*
Lynn: # *John fell,* donc *Mary pushed him.*

The QUD compatible with *John fell donc Mary pushed John* cannot be *How can we explain that John fell?* nor *What is the cause of John's falling?*, because what is at stake is what can be *concluded* from John's falling. John's falling is an an unexplained fact, an *enigma* to be solved; being a kind of *epistemic detective*, the speaker choosing *donc* has to resolve this enigma. So, the QUD is not about the cause, and nor is it the explanation of a fact or an event. Instead, it relates to the enigma of John's falling: *what can we conclude of John's falling?*

(413) Peter: *What can we conclude from John's falling?*
Lynn: *Mary pushed him.*[3]

The reasoning for the inferential use of *donc* is therefore:

(414) a.	Premise:	John fell
b.	Background knowledge:	If John fell, it is because someone pushed him. Who could it be?
c.	Assumption:	Mary pushed John
d.	Conclusion:	Mary pushed John is a possible cause of John's falling

The conclusion (414d) explains why the proposed cause might be false. For instance, (415) is quite natural:

3 The answer with *donc* is not really appropriate, mainly because the adverbial status of *donc*. The assumption is *donc* includes the QUD and introduces the consequence, as in (a). However, a complete answer includes *donc*:

(i) QUD: What can we conclude from John's falling?
Answer: a. (donc) *Mary pushed him.*
b. *John fell*, donc *Mary pushed here.*

(415) Peter: *What can we conclude from John's falling?*
Lynn: *Mary pushed him.*
Peter: *Not at all: we can conclude that John is clumsy, not that Mary caused his falling.*

In essence, the inference process is not the same for the inferential *donc* as it is for the causal *parce que*. Whereas the causal *parce que* warrants the truth of the cause, the factivity of the cause is not warranted with *donc*. This property is also true of the causal iconic usage of *donc*, although in that case it is about the consequence. As argued above, the consequence of *donc* is ensured only when the cause is a state, because the causal relation is warranted by a causal law (a *nomological* rule in Blochowiak 2014a). When the cause is an event, the consequence (event or state) is not warranted, because the connective does not entail the discourse segment it introduces. This is a stark difference between *parce que* and *donc: parce que* is a factive connective, ensuring the truth of the cause it introduces, whereas *donc* is not factive, as the cause of the consequence it introduced is not warranted. Given that *donc* is not factive – so in *P donc Q*, only *P* is entailed – what can be said of the causal relation now? As the causal relation is not warranted, and the consequence can be false, the causal relation between *P* and *Q* cannot be an explicature, which is a truth-conditional meaning. Instead, it can only be a defeasible pragmatic inference – that is, a generalized conversational implicature ("it is possible that *X* causes *Y*").

The procedural meaning of *donc* – given that it can have a causal forward meaning – is the forward causal direction *P* CAUSE *Q*. In terms of inferential meaning, only the forward relation is preserved, whereas the causal conceptual meaning is substituted for a conclusion relation. The substitution of a causal meaning for another conceptual meaning is a central property of *weak* connectives, which will be discussed in the next section. So, a complete description for *donc* is given in (416):

(416) *A complete analysis of P donc Q*
a. conceptual meaning
1. entailment P
2. implicature POSSIBLE [X CAUSE/CONCLUSION Y]
b. procedural meaning
1. causal reading P CAUSE Q
2. inferential reading Q CONCLUSION P

This provides an initial answer on the difference between *parce que* and *donc: donc* allows a partial forward causal reading, and a complete inferential reading,

whereas *parce que* is compatible with non-iconic causal readings and iconic epistemic and speech act readings. Thus, choosing between *parce que* and *donc* depends on several criteria: the type of QUD, the type of reading, and also the nature of the conceptual and procedural meanings of the connective.

5.3 *et*

The final connective to describe according to the same template is *et* 'and'. The conjunction connective *and* has been extensively described, mainly in terms of its temporal and causal meanings (see for instance Carston 2002, Levinson 2000 a.o.). On the one hand, these approaches attribute the enriched temporal and causal meaning to an inferential process which is not piloted by the semantics of the connective, restricted to its logical meaning (Carston 2002); on the other hand, a neo-Gricean approach such as Levinson's attributes the enriched meaning to a procedure triggered by the connective itself (Levinson 1983; see chapter 3), or to the result of an I-implicature (Levinson 2000). This chapter – and this book – have developed an alternative approach, sharing some properties of both approaches, but with a different distribution. First, it maintains the classic post-Gricean analysis of the semantics, giving a logical meaning to *and*, and a *fortiori* for its French counterpart *et*. This means that *P and Q* both entails *P* one the hand and *Q* on the other. Second, temporal and causal meanings are not interpreted as an implicature, mainly because of Cohen, L. Jonathan's (1971) issue on conditionals, repeated here in (417):

(417) a. *If the old king has died of a heart attack and a republic has been declared, then Tom will be quite content*.
b. *If a republic has been declared and the old king has died of a heart attack, then Tom will be quite content*.

As argued in chapter 3, if the temporal meaning of *and* is an implicature, then the conditionals *if P and Q* and *if Q and P* should have the same meaning (that is, the same truth-conditions), simply because impli-catures are non-truth-conditional meanings. One principal issue with the explicature-type meaning explanation is the cancellation test. Chapter 1 demonstrated that explicatures can be denied without contradiction, as (418) shows:

(418) a. *Abi and Fée did not climb the Roche of Solutré together, but individually.*
b. *Abi and Fée climbed the Roche of Solutré, but not together.*

At least for its temporal meaning, *and* triggers an enriched meaning at the level of explicature. As for the causal meaning of *et* 'and', it can have an iconic reading with an eventive cause (419), as well as a non-iconic or explanatory reading as in (420):

(419) a. *Mary pushed John* et *he fell.*
b. *Mary ate too much* et *she is sick.*

(420) a. *John fell,* et *Mary pushed him.*
b. *Mary is sick,* et *she ate too much.*

As the conjunction connective is not mandatory when associated with a causal meaning, the *conceptual meaning* of *et* is context dependent, picked out from a set of possible relations including temporal inference, causal inference and explanation. My hypothesis, advocated in Moeschler (2016a, 2016b), is that the connective *et* does not have a specific conceptual meaning, but encodes a set of conceptual meanings, all contextually activated. Such a case has already been seen with *donc*, associated with a causal and a conclusion meaning, as far as its conceptual meaning is concerned. In other words, the more specific the conceptual meaning, the stronger the connective; the less specific the conceptual meaning, the weaker the connective. *Donc* is predicted to be an intermediary case, between strong *parce que* and weak *et*.

As for the *procedural meaning* of *et*, this analysis predicts that when the cause is an event, the direction of the causal inference is forward, and when *et* introduces an eventive discourse, the relation is backward; *et* is not causal *per se*, but more an explanation of the reason why the consequence discourse segment has been uttered. For instance, the interpretations of (419a) and (420a) are given in (421) and (422) respectively:

(421) *Mary pushed John* CAUSES *John fell*

(422) *John fell,* and the speaker gives a reason (*Mary pushed him*) why he said that John fell

In the case of (419), the causal reading is the result of the entailments caused by the connective (*P and Q* entails *P* and *Q*) as well as background knowledge.

As a result, when the causal inference takes place, the conditional relation is enriched to a causal one:

(423) a. Premise: Mary pushed John
b. Premise: John fell
c. Background knowledge: If Mary pushes someone, then he fell
e. Inference: Mary pushed John CAUSE John fell

In the case of (420a), the reasoning which allows us to conclude that there is a causal relation between the consequence (*John fell*) and the cause (*Mary pushed John*) is different, thanks to the nature of the backward causal relation:

(424) a. Premise: John fell
b. Premise: Mary pushed John
c. Background knowledge: If Mary pushes someone, then he fell
e. Inference: Mary pushed John EXPLAINS WHY THE SPEAKER SAYS John fell

As such, the causal relation is forward in the causal reading and backward in the explanation reading. (425) gives the complete semantic and pragmatic description of *et*:

(425) *A complete analysis of P et Q*
a. conceptual meaning
1. entailments P, Q
2. implicature POSSIBLE [X CAUSE/EXPLAINS Y]
b. procedural meaning
1. causal reading P CAUSE Q
2. inferential reading Q EXPLAINS WHY THE SPEAKER SAYS P

Unlike *donc*, the main issue for this analysis is the implicature status of the possible causal relation. Recall from chapter 3 that the implicature analysis is problematic because of Cohen's examples. However, what has not been considered in the explicature analysis is the entailments of *and*, which give truth-conditional status to both conjuncts. If the causal or explanatory relation is an implicature, it is then defeasible, which is in fact the case in (426):

(426) *Mary pushed John and he fell, but for another reason.*

However, (426) is awkward from a pragmatic point of view, because the presence of *and* allows the addressee to draw a specific causal inference. The adjunction of a modal operator to the causal relation (POSSIBLE [*X* CAUSE/EXPLAINS *Y*]) shows that the speaker's commitment is weak when it comes to the causal reading, which should not be the case if it had been interpreted as an explicature (see chapter 1 and the scale of strength).

Can Cohen's puzzle be solved within an implicature analysis? Levinson's analysis does not resolve this problem, as it admits that I-implicatures (that is, Informative-implicatures) contribute at a pre-pragmatic level to the truth-conditions of the proposition expressed (Levinson 2000: 188; see Zufferey, Moeschler, and Reboul 2019 for a general discussion). In fact, Cohen's criticism directly addresses the classic Gricean analysis which makes a straightforward distinction between truth- and non-truth-conditional meanings. However, the theoretical perspective in this book is neither Gricean nor neo-Gricean: it is post-Gricean, but with an enriched version of the semantics of the connectives, as proposed in this chapter. So, assuming a rich semantics for connectives, Cohen's puzzle can be solved as follows.

First, when *P et Q* is processed, both *P* and *Q* are evaluated as true, and the connective *et* invites us to find a relevant content relation; if a forward causal connection is accessible, then the causal implicature is triggered, leading to a truth-conditional evaluation (see chapter 1); when a *but* clause cancels the causal relation, only the entailments are true of the conjunction. Second, when *P, and Q* (in the explanatory reading) is processed, both *P* and *Q* are entailed, but access to a reason for articulating such a relation comes into question. If a background causal relation is accessible, then it is inferred that *Q causes P*. In this interpretation, the denial of the explanation implicature is also possible and relevant, as in (427):

(427) *John fell,* et *Mary pushed him, but there is no causal relation between these events.*

The proposed analysis thus meets the classic test of implicatures, which is cancellation.

6 Conclusion: the big picture

The big picture for causal, inferential and temporal connectives can now be revealed. First, consider entailments and causal relation in Table 40:

Table 40: Entailments and causal relations in *parce que, donc* and *et*.

	P	Q	*P* CAUSE *Q*	*Q* CAUSE *P*
parce que	✓	✓	✓	✓
donc	✓	◊	◊	◊
et	✓	✓	◊	◊

For *parce que, Q* is entailed, like *P*, even in the inferential and the speech act usages. *Q* CAUSE *P* is the explicature of the content use, whereas *P* CAUSE *Q* is the inference in the epistemic use. With *donc*, only *P* is entailed, because *Q* can be defeated. The causal relations are only possible in the forward (causal) and backward (inferential) directions. Finally, *et* entails both *P* and *Q*, and the causal relation is only possible, although in both orders. As this table shows, *parce que* is the only causal connective – either forward, backward or inferential. Table 41 adds further detail in the form of the nature of the relation, be it entailment, implicature or explicature:

Table 41: Entailment, explicature and implicature encoded by *parce que, donc* and *et* (causal readings).

nature of meanings →			**conceptual**		**procedural**
types of meaning relations →	**entailment**		**explicature**	**implicature**	**direction of CAUSE**
↓ connectives					
parce que	P	Q	X CAUSE Y	–	Q → P
donc	P	–			
et	P	Q	–	◊ (X CAUSE Y)	P → Q

First, *entailments*, *explicatures* and *implicatures* are *conceptual* meanings: they directly concern the type of propositions inferred and the relation between them. Second, *procedural* meaning is about the direction of the causal meaning: backward for *parce que*, forward for *donc* and *et*. Third, the main difference between connectives is in the type of meaning encoding the causal relation: explicature for *parce que*, implicature for *donc* and *et*. And finally, both *et* and *parce que* entail *P* and *Q*.

What happens in the inferential reading for these connectives? Table 42 summarizes what has been discussed in this chapter, showing a symmetrical picture for these connectives:

Table 42: Entailment, explicature and implicature encoded by *parce que, donc* and *et* (inferential readings).

nature of meanings →			**conceptual**		**procedural**
types of meaning relations →	**entailment**		**explicature**	**implicature**	**direction of CAUSE**
↓ connectives					
parce que	P	Q	X CAUSE Y	–	P → Q
donc	P	◊ Q			
et	P	Q	–	◊ (X CAUSE Y)	Q → P

There is now a full picture of the semantics and pragmatics for causal, inferential and temporal connectives. What is striking is that these connectives are close – unsurprising, given that they can have causal and inferential meanings – but differ in many respects. The most important difference is not in the content of the meaning they display, but in the level at which it is located. *Parce que* encodes the causal relation as an *explicature*, whereas *donc* and *et* encode the same relation as an *implicature*, modified by an epistemic possibility operator (◊). As for entailments, the distribution is perfectly complementary; as the epistemic and the speech act usages for *parce que* show, there is no entailment from *P parce que Q* to "*P* and *Q*", contrary to most proposed descriptions of causal connectives.

I believe that the analysis provided in this chapter leads to a new vision of the semantics and pragmatics of connectives: while most descriptive proposals on connectives insist on their specific meanings (the classic form-meaning variation called *logical-grammatical parallelism*), I propose reducing the description of connectives to a minimal set of entailments and semantic relations, such as CAUSE, which receive different distributions and orientations according to the conceptual and procedural meanings constituted. This proposal can now explain why *parce que* is closely associated with a causal meaning: being an explicature, it is stronger (chapter 1) than an implicature, and also more accessible. So, a discourse with a causal connective is predicted to be more efficient if the choice of the connective is a true causal connective like *parce que* and *because* – as opposed to an indirect causal connective such as the inferential *donc* and the temporal *et* – and is also predicted to be more efficient and less costly than causal discourse without connectives. Last but not least, as the analyses in Tables 41 and 42 show, it is beyond doubt that a set of connectives can be used to express the same discourse relation. What makes the difference is not the *encoded content*, but the *path* by which the causal meaning is obtained. Finally, this analysis is compatible with the temporal meaning of *et* in

what is termed Cohen's paradox: in the *if P and Q, then R* examples, the temporal meaning is no longer an implicature, but an explicature. In other words, one of the first steps in interpreting a causal reading with *et* is simply to enrich the complex proposition obtained, and then to derive the causal possible implicature. With this explanation, there is no longer a contradiction in interpreting some effects of the conjunction as explicature and others, more specific in content, as implicature.

Part IV: **Logical words**

7 Logical connectives and pragmatic meaning

1 Introduction

To describe logical connectives as a classic issue is a gross understatement. In the philosophy of language, there have been long and fruitful discussions about the logical meaning of connectives such as *and, or* and *if* (see Moeschler and Reboul 1994, chapter 6); from a linguistic point of view, it has long been observed (Allwood, Andersson, and Dahl 1977) that logical connectives' logical meaning is much simpler than their pragmatic meaning. Indeed, Grice's (1975: 41) paper on implicature focuses on this exact divergence:

> It is a commonplace of philosophical logic that there are, or appear to be, divergences in meaning between, on the one hand, at least some of what I shall call the FORMAL devices— ¬, ∧, ∨, ⊃ , (x), ∃(x), ∫x (when these are given a standard two-valued interpretation) – and, on the other, what are taken to be their analogues or counterparts in natural language – such expressions as *not, and, or, if, all, some* (or *at least one*), *the*.

In his terminology, Grice makes the difference between the *formalist* approach – where the difference between logical meaning and pragmatic meaning is mainly syntactic, reflecting the perfect vs. imperfect nature of formal (that is, logical) and natural language respectively – and the *informalist* approach, where there is no relation between logic and natural language. To avoid this alternative, Grice propose a new approach, justified as follows:

> I wish, rather, to maintain that the common assumption of the contestants that the divergences do in fact exist is (broadly speaking) a common mistake, and that the mistake arises from an inadequate attention to the nature and importance of the conditions governing conversation. I shall, therefore, proceed at once to inquire into the general conditions that, in one way or another, apply to conversation as such, irrespective of its subject matter. (Grice 1975: 43)

In Gricean terms, the pragmatic meaning of logical connectives is obtained by an implicature. Even though Grice does not give such examples in his seminal paper, the Gricean tradition has been followed in various works, giving rise to a generalized conversational implicature for *and* using the sub-maxim of manner "Be orderly" (Grice 1978), a scalar implicature for *or* (Gazdar 1979), and an invited inference for *if* (Geis and Zwicky 1971). Examples (432) to (434) are illustrations of these classic interpretations:

(428) a. *Abi screamed and Axel beat her.*
b. Abi screamed and then Axel beat her.

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(429) a. On a menu: *Cheese or dessert*.
b. Cheese or dessert and not both.

(430) a. *I'll give you €10 if you mow the lawn.*
b. I'll give you €10 if and only if you mow the lawn.

In other words, the "and then" meaning for *and*, the exclusive meaning for *or* and the biconditional meaning for *if* can be interpreted as the result of an implicature: a meaning which is non-logical because it is non-truth-conditional.

In this chapter, I will start by giving an argument in favour of the formalist approach (section 2), mainly because it raises a very interesting issue: which of the 16 possible truth-functional connectives are possible candidates in natural language? In section 3, I will consider how Gricean, neo-Gricean and post-Gricean approaches can explain the pragmatic enrichment of logical connectives. This will raise the issue of truth-conditional meanings and the difference between logical connectives and discourse connectives, such as those discussed in chapter 6 (section 4). Section 5 returns to the issue of conceptual/procedural meaning, as addressed in chapter 2 in general terms and in chapter 6 for causal connectives. Finally, section 6 will conclude by summarizing the issues of, and solutions to, the pragmatic meaning of logical connectives.

2 A formalist account of logical connectives

This section will report on Gazdar's approach to truth-function connectives. While rarely considered in the discussion on connectives and their logical meaning (for an exception, see Moeschler and Reboul 1994: chapter 6), Gazdar's proposal is convincing, as he proposes reducing *truth-functional connectives* (TFCs) to conjunction and disjunction – that is, *and* and *or*. As a TFC connects two propositions that can be true or false, there are 16 possible TFCs, because the two arguments (propositions) are combined with four truth values: 1–1, 1–0, 0–1 and 0–0. These 16 possible values are provided in Table 43 (Gazdar 1979: 69), with the possible connectives labelled from *A* to *O* plus *V* and *X*:

What are the meanings of these 16 TFCs?

- *A* corresponds to $\vee$ (inclusive disjunction);
- *B* to $\leftarrow$ (material implication from *Q* to *P*);
- *C* to $\rightarrow$ (material implication);
- *D* to $\uparrow$, the negation of the conjunction ($\neg\wedge$);
- *E* to $\leftrightarrow$ (biconditional);

- *F* to the proposition ¬*P* (negation);
- *G* to ¬*Q*;
- *H* to *Q*;
- *I* to *P*;
- *J* to $\bar{\vee}$ (exclusive disjunction);
- K to $\wedge$ (conjunction);
- L to $\nrightarrow$, the negation of material implication (¬ →);
- M to $\nleftarrow$, the negation the material implication from Q to P (¬ ←);
- O to $\bot$ (contradiction);
- V to $\top$ (tautology);
- and X to $\downarrow$, the negation of the inclusive disjunction (¬ $\vee$).

Table 43: 16 possible TFCs.

P	Q	A	B	C	D	E	F	G	H	I	J	K	L	M	O	V	X
1	1	1	1	1	0	1	0	0	1	1	0	1	0	0	0	1	0
1	0	1	1	0	1	0	0	1	0	1	1	0	1	0	0	1	0
0	1	1	0	1	1	0	1	0	1	0	1	0	0	1	0	1	0
0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1

To make it easier to evaluate these connectives, Gazdar proposes reducing the number of connectives from 16 to 8, by grouping the arguments to three sets of truth-values: {1} = 1–1; {0,1} = 1–0 and 0–1; and {0} = 0–0. Table 44 shows the new set of TFCs, the relevant set for deciding which connective is a TFC.

Table 44: Candidates for TFCs in natural language.

Arguments	A*	D*	E*	J*	K*	O*	V*	X*
{1}	1	0	1	0	1	0	1	0
{0,1}	1	1	0	1	0	0	1	0
{0}	0	1	1	0	0	0	1	1

Now, it must now be decided which connective is a TFC:

- *O** (contradiction) is not relevant for natural language. It means that sentences in (431) receive the same truth value – false (0) – whether the truth-value of the sentence is true or false. *O** must thus be abandoned:

(431) a. *Geneva is an international city* (1), O* (0) *Bern is the capital of Switzerland* (1)
b. *Geneva is not an international city* (0) O* (0) *Bern is the capital of Switzerland* (1)
c. *Geneva is not an international city* (0) O* (0) *Bern is not the capital of Switzerland* (0)

– The same argument can be used for *V** (tautology), because it would result in considering all the sentences in (431) to be true.

As for the other TFCs, no logical criterion can be used, which is why Gazdar proposes a pragmatic criterion termed the *principle of confessionality*. This principle states that a TFC cannot yield a true proposition from false arguments: a TFC *c* must admit that its argument is false by yielding a false truth-value to false arguments, as shown in the following definition:

Principle of confessionality (Gazdar 1979: 76)
A connective $c \in C$ is confessional iff $c(\{0\}) = 0$

This criterion, which can be referred to the first maxim of Quality ("Do not say what you believe to be false", Grice 1975: 46), allows the connectives *D**, *E**, and *X** – all of which yield a truth-value true (1) with false arguments (0) – to be rejected, leaving the final candidates *A**, *J** and *K**:
– *A** corresponds to inclusive *or* (that is, inclusive disjunction);
– *J** to exclusive *or* (exclusive disjunction);
– and *K** to conjunction (*and*).

When it comes to the two types of *or*, exclusive and inclusive, it has been demonstrated (Gazdar 1979) that exclusive *or* can be derived from inclusive *or* by conjoining the inclusive meaning of *or* (its logical meaning) with its scalar implicature (*not-and*), as Table 45 shows:

Table 45: The derivation of exclusive-*or* from inclusive-*or* and its implicature *not-and*.

P	Q	P ∨ Q	P ∧ Q	¬ (P ∧ Q)	(P ∨ Q) ∧ ¬ (P ∧ Q)	P $\bar{\vee}$ Q
1	1	1	1	0	0	0
1	0	1	0	1	1	1
0	1	1	0	1	1	1
0	0	0	0	1	0	0

As a result, the only possible TFCs in NL are *inclusive disjunction* and *conjunction*, which is to say *or* and *and*. What is predicted is that these two connectives must be semantic universals in natural language. But can the same reasoning be used for negation, which has only one argument? And what about the conditional connective? The latter – *C* in Table 43 – is ruled out by the principle of confessionality: its false arguments (0–0, and also 0–1) yield a true proposition (1); if we take the equivalence connective (biconditional), the same principle applies to *E**. So, conditionality is ruled out of the scope of the truth-functional connectives domain. What does this mean in practice? Take a simple example of conditionals, as in (432):

(432) If John comes to the party, Mary will leave.

In (432), what is said by the speaker is not factive: the speaker considers the possibility of John's coming to the party, but is not committed. So, what has to be considered is the following situations: (i) John comes and Mary leaves; (ii) John does not come and Mary does not leave; and (iii) John does not come and Mary leaves. What the meaning of the logical *if* excludes is (iv) John comes and Mary does not leave. However, (iii) is pragmatically excluded; if the speaker means to say that John does not come to the party and Mary leaves, she should have chosen another connective like a concessive or unconditional, as in *even if* or *although*.

(433) *Even if/although John does not come to the party, Mary will leave.*

So, unlike conjunction and disjunction, where the speaker is committed to the truth of both conjuncts with *and*, and to at least one disjunct with *or*, the conditional does not allow the hearer to infer what the speaker prefers. If the speaker has a preference, she can make her choice explicit, but it must then be positive rather than negative in the indicative mood, as (434) shows:

(434) a. If John comes to the party, and he will come, Mary will leave.
b. # If John comes to the party, and he will not come, Mary will leave.

On the contrary, if the speaker is more committed to the falsity of the antecedent, then the subjunctive mood must be a past conditional (Karttunen and Peters 1979):

(435) a. # If John were to come to the party, and he will, Mary would leave.
b. If John were to come to the party, and he will not, Mary would leave.

So, the preference in terms of commitment is for the truth of the antecedent when it is in the present tense (indicative mood), but for its falsehood when the antecedent is in the past tense (subjunctive mood). However, in neither case is there a strong commitment from the speaker, nor a confession of the arguments' falsity.

What conclusion can be drawn from the examples of conditionals? One of the most important is that the conditional connective is used in reasoning (Mercier and Sperber 2017; Moeschler 2018d). The most beautiful example for reasoning comes from the four cards puzzle, introduced by psycholinguists in the 1960s to test the reasoning abilities of human beings. The result, most of the time replicated, is that we are very bad at solving this puzzle (with fewer than 10% of answers correct). Mercier and Sperber (2017: 40) lay out the problem in a crystal-clear manner, based on Wason's experiment (Wason 1968).

> Here is how Wason's experiment goes. "In front of you are four cards," the experimenter tells you. "Each card has a letter on one side and a number on the other. Two cards (with E and K) have the letter side up; the two others (with a 2 and a 7) have the number side up" [...]
>
> "Your task is to answer to the following question: Which of the four cards must be turned over to find out whether the following rule is true or false of these four cards: 'If there is an E on one side of a card, then there is a 2 on the other side'?"
>
> Which cards would you select?

What matters, in working out which cards to select, is whether or not the choice obeys the inferential rules of conditionals. Going through the options one by one:

- You choose to turn card E. If so, you are entitled to conclude that there is a 2 on the other side, because of the inferential rule (*modus ponens) if P, then Q; P; therefore Q*.
- You choose to turn card K. In this case, you are in the situation of the *denial of the antecedent*, but nothing follows logically, because there is no deductive rule of the form *if P, then Q; not-P; therefore not-Q*. So, by choosing this card, you lose, as you can neither confirm nor disconfirm the rule.
- Third choice: you choose card 2. But if you hope to turn card 2 and find an E on the other side, nothing would follow from this, because there is no rule of the form *if P, then Q; Q; therefore P*. Again, this is the wrong choice, and you lose.
- Fourth choice: you choose card 7. In this case, you *deny the consequent* by applying the *Modus tollens: if P, then Q; not-Q; therefore not-P*. This is a valid inference rule, and you win; it means that you should not find an E in the other side of the card.

What conclusion can be drawn from the dramatic gulf between statistical chance (50% win, 50% lose) and experimental results (where only 10% of experimental participants were right)? These results, confirmed by other experiments, show only that we are bad at reasoning *without context*. Equally, as Mercier and Sperber point out, when participants are required to think and solve problems together, they perform far better.

The conclusion is that the conditional connective *if* plays a crucial role in inference rules, mainly because it is not truth-functional, in Gazdar's terms. This leads to a new issue, one very interesting from an evolutionary perspective: are logical connectives, including *and*, *or* and *if*, mainly reduced to an inferential function ensuring the success of valid inferences? Before answering this question (section 4), how can we explain the truth-conditionality of negation?

As stated above, negation is a unary operator, because it has only one argument. There are thus 4 possible unary operators, because the truth values for the argument (1 or 0) can be both true or false (2^2). These operators, with their truth values, are given in Table 46 (from Gazdar 1979: 68):

Table 46: Possible unary operators in NL.

argument	T	N	P	Q
1	1	0	1	0
0	0	1	1	0

T yields the same truth values to the argument; *N* inverses its truth values, while *P* and Q give the same truth values to the argument irrespective of its truth value. So, the issue is how we can explain that only *N* is a truth-functional operator, and gives the reverse truth values of the argument.

First, *T* is eliminated by the submaxim of Manner "Be brief"; in effect, there is an equivalence between any proposition ϕ and *T*ϕ: $T\phi \leftrightarrow \phi$. As a result, *T* is not a candidate to be a truth-conditional operator. However, natural languages seem to have such an operator, which is expressed by *it is the case that*, or *it is true that*. As such, (436a) and (437a) can be paraphrased as (436b) and (437b) without it seeming redundant:

(436) a. It is raining.
b. It is the case that it is raining.

(437) a. It is not raining.
b. It is not the case that it is raining.

Second, operators *P* and *Q* are eliminated because of the maxim of Relation ("Be relevant"). Whatever the truth value of ϕ and ψ, $P\phi$ is true and $P\psi$ is true, which yields the equivalence between $P\phi$ and $P\psi$: $P\phi \leftrightarrow P\psi$. The same reasoning holds for the operator *Q*, but with a false truth value: $Q\phi$ is always false and $Q\psi$ is always false, so $Q\phi \leftrightarrow Q\psi$. As a consequence, only *N* is available for natural language. *N* is informative, since it changes the truth value of the argument; in addition, *N* can be used to define *T*: $T\phi \leftrightarrow NN\phi$.

In sum, negation is the only possible unary operator for natural language. This is good news, because it implies that a negative statement is the falsehood of the proposition over which the negation scopes. As chapter 8 will discuss, this bold assumption about the truth-conditional meaning of negation leaves an important issue to one side: some uses of negation which are truly negative do not seem to change the truth value of the utterance. For instance, in (438), the proposition under linguistic negation is entailed by the corrective clause, and is not stated as false, as in (439):

(438) a. *Abi is not beautiful, she is gorgeous*.
b. Abi is gorgeous → Abi is beautiful

(439) a. *Abi is not beautiful*.
b. It is not the case that Abi is beautiful

As will be shown, metalinguistic uses of negation such as (438a) raise an interesting issue about the univocity of negation, as far meaning is concerned. Chapter 8 will give extensive arguments to support a monoguist approach to negation, as argued by Horn (1985, 1989) and Carston (2002), among others (see also Moeschler 2010b, 2013b, 2018a, 2019a).

3 Gricean, neo- and post-Gricean accounts for logical connectives

The classic Gricean approach to logical connectives is to derive the pragmatic meaning by way of pragmatic principles. However, although there is a submaxim of manner explaining the temporal meaning of *and*, there is no maxim explaining its causal meaning (see chapter 6). When it comes to disjunction,

the main issue is the substantial qualitative difference between the speaker's meaning and the pragmatic meaning (that is, the implicature). It can indeed be supposed that a speaker saying *P or Q* is respecting the sub-maxim of Quantity (quantity 1) "Make you contribution as informative as is required (for the current purposes of the exchange)" (Grice 1975: 45). So, if a speaker says *P or Q*, it is because he cannot say *P and Q*. The alternatives are thus <*and*, *or*>, and by choosing the lower-bound connective, the speaker implicates the negation of its upper-bound counterpart. This creates a serious issue: the implicature of *or* ("not-and") cannot be what the speaker means, because it leaves open a situation where both disjuncts are false, yielding a true situation, as Table 47 explains:

Table 47: The unpredictable meaning of *not-and*.

P	Q	P ∨ Q	P ∧ Q	¬ (P ∧ Q)
1	1	1	1	0
1	0	1	0	1
0	1	1	0	1
0	**0**	0	0	**1**

In other words, the implicature meaning "not-and" allows for a situation where a menu item *cheese or dessert* implies that *not*(*cheese and dessert*) would be true when there is neither cheese nor dessert. As demonstrated by Table 45, the exclusive meaning of the disjunction is the result of the conjunction of *or*-inclusive meaning and its scalar implicature.

The question is knowing whether *cheese or dessert* really means *not* (*cheese and dessert*) or simply that the client has a *free choice*, and can choose cheese, or can choose dessert. From a different perspective – that of the restaurateur – there is no way to know in advance which of the two items the client will choose. So, there is a general *ignorance implicature*, rather than a scalar implicature. Take, for instance, this example by Grice (1978: 116): "I can say to my children at some stage in a treasure hunt, *The prize is either in the garden or in the attic*". In this case, the speaker's use of *or* implicates that he does not know where the prize is; but this is not the semantic meaning of *or*, because this meaning is cancellable. Grice goes on by saying, "I know that because I know where I put it, but I'm not going to tell you". As it is cancellable, *or*'s pragmatic meaning (that the speaker does not know that *P* is true, and the speaker does

not know that *Q* is true) justifies the choice of the weak term. By respecting the first maxim of quantity, the speaker also respects the first maxim of Quality: "Do not say what you believe to be false" (Grice 1975: 46). In other words, *P or Q* is less informative than *P*, and than *Q*. But if the father had answered his daughter's question (440) with (440a) rather than (440b), it is because he has evidence that one of the disjuncts is true. By choosing the disjunction, he implicates that he does not know which one of the disjuncts is true:

(440) Daughter: *Where is mum?*
Father: a. *In the kitchen.*
b. *In the kitchen or in the bathroom.*

This gives a partial Gricean analysis for *and* and *or*. What about *if*, and in particular its pragmatic enrichment "if and only if"? It is a well-known observation that ordinary conditionals are interpreted as biconditionals (Geis and Zwicky 1971, Cornulier 1985, van der Auwera 1997a, 1997b), such that (441a) pragmatically means (441b):

(441) a. *If you are nice, I'll give you an ice-cream.*
b. If you are not nice, I won't give you an ice-cream.

What is interesting in (441) is that the child to whom (a) is addressed understands (b), which means that the negative implicature is more relevant than the positive conditional. The other way around is also true, since if the speaker utters (441b), he implicates (441a). The question is how to explain the path from a simple conditional to a biconditional. As Table 48 shows, the biconditional is a restriction in meaning from the conditional, which has been described as the *conditional perfection* (van der Auwera 1997a)

Table 48: Truth-conditional meaning for conditional (→) and biconditional (↔).

P	Q	P → Q	Q → P	P ↔ Q = (P → Q) ∧ (Q → P)
1	1	1	1	1
1	0	0	1	0
0	1	1	0	0
0	0	1	1	1

The biconditional – equal to the conjunction of the conditional relation from *P* to *Q* and from *Q* to *P* – is a restriction of the logical meaning of the conditional, as the exclusive meaning of *or* is a specification of its inclusive meaning. However, where *or*'s exclusive meaning is obtained by its scalar implicature and inclusive meaning, making reference to Quantity1 and Quality1 maxims, what contribution might the maxims of conversation make to the more specific biconditional meaning?

First, it must be stated that there is no scale where *if* could be a weak form, giving rise to a scalar implicature; so the biconditional meaning is not the result of the negation of a stronger connective. However, there is a stronger connective than *if* (*since*), giving rise to a clausal implicature (Gazdar 1979: 80): *P connective Q* clausally implicates that *P*, *not-P*, *Q* and *not-Q* are possible. In an ordinary conditional like (442), (443a-d) are clausally implicated. The same is true for *or*, as (444) and (445) show:

(442) *If John comes, Mary will leave*.

(443) a. It is possible that John comes.
b. It is possible that John does not come.
c. It is possible that Mary leaves.
d. It is possible that Mary does not leave.

(444) *Mary is in the kitchen or in the bathroom*.

(445) a. It is possible that Mary is in the kitchen.
b. It is possible that Mary is not in the kitchen.
c. It is possible that Mary is in the bathroom.
d. It is possible that Mary is not in the bathroom.

The clausal *if* implicatures do not contribute to a stronger meaning, like the biconditional meaning. Moreover, reference can be made to neither the maxims of Quantity nor Quality, let alone Manner ("Be perspicuous"): the only relevant maxim is the maxim of relation "Be relevant". If (442) is a speaker's relevant contribution, then the conditional meaning must be specified as biconditional, mainly because the situation where John does not come but Mary leaves is pragmatically irrelevant to (442). A Gricean analysis is thus possible but gives *ad hoc* results: *and* implicature is the result of the submaxim of order; *or*'s exclusive meaning is the result of its scalar implicature and its inclusive meaning; and the biconditional meaning of conditionals results from the maxim of relation.

So, what about neo- and post-Gricean interpretations of logical connectives? A neo-Gricean perspective, such as Levinson (2000), sees the augmented and enriched interpretation of *and* as a special case of an I-implicature, based on the principle of informativeness (I-Principle). (450) is an illustration of the augmented and enriched interpretation of *and*:

> I-Principle
> *Speaker's maxim*: The maxim of Minimization; "Say as little as necessary" (. . .)
> *Recipient's corollary*: The Enrichment Rule. Amplify the informational content of the speaker's utterance, by finding the most specific interpretation. (Levinson 2000: 114)

(446) Conjunction buttressing (Atlas & Levinson 1981)
John turned the key and the engine started.
+> John turned the key *and then* the engine started (temporal sequence)
+> John turned the key *therefore* the engine started (causal connectedness)
+> John turned the key *in order to cause* the engine start (teleology, intentionality)

The first augmented interpretation is the temporal one, and if it succeeds – that is, if it is not subject to controversy – the addressee can go a step further and try the causal reading, and finally the intentional reading. So, the I-principle is based on a convention of *noncontroversiality* based on two maxims of relativity (Atlas and Levinson 1981: 40):

> *First maxim of relativity*
> A speaker must not say what he believes to be highly uncontroversial. This means that any proposition entailed by the common ground need not to be said.
>
> *Second maxim of relativity*
> The hearer must take what he hears as highly uncontroversial, that is, as consistent with the common ground.
>
> *Convention of noncontroversiality*
> Obtaining a stereotypical relation between individuals is noncontroversial.

What does this mean for disjunction? Where *and* implicature is clearly an I-implicature, *or*-implicature is a Q-implicature, based on the Q-Principle, defined in Levinson's terms as follows (Levinson 2000: 76):

> *Q-Principle*
> *Speaker's maxim*: Do not provide a statement that is informationally weaker than your knowledge of the world allows. (. . .) Specifically, select the strongest paradigmatic alternate that is consistent with the facts.

Recipient's corollary: Take it that the speaker made the strongest statement consistent with what he knows.

The speaker's maxim and the recipient's corollary explain that, if the speaker has chosen the weak alternate, she Q-implicates the negation of the strong alternate. For *or* to launch a Q-implicature, there must be a Horn's scale, <*and, or*>, where *and* entails *or* and *or* implicates *not-and*. As discussed in the previous section, the Q-implicature (that is, the scalar implicature) does not provide the expected meaning, since the negation of *and* is not equivalent to the exclusive-*or*; equally, *or* leads more easily to the *ignorance* implicature, which has been explicitly demonstrated by Fox (2007) and Chierchia (2013), showing that the scalar implicature of *P or Q* is only inferable if the audience has an opinion on the truth or falsehood of the stronger alternate (that is, *P and Q*).

Finally, the neo-Gricean analysis of conditionals is limited to the clausal implicature analysis, leaving unsolved the question of what is true or false as far as the antecedent and the consequent are concerned – see (442) and its implicatures (443). However, another analysis of conditionals has been proposed by Karttunen, Lauri and Peters, Stanley (1979), based on the concept of *conventional implicature*. As defined in chapter 1, CIs are non-calculable, non-cancellable, non-truth-conditional, detachable, based on what is said, and determinate (Sadock 1978). The idea of Karttunen and Peters (1989: 8) is that a conditional CI is about the epistemic possibility of the antecedent. In the indicative mood, the antecedent is possible, whereas in the subjunctive mood, its negation is epistemically possible, as follows:

(447) *If A then B* conventionally implicates:
   a. Indicative mood: "It is epistemically possible that A"
   b. Subjunctive mood: "It is epistemically possible that not-A"
      where *epistemically possible* means "possible in relation to what is known".

In short, the Gricean and neo-Gricean pictures of the pragmatic meaning of logical connectives are not homogeneous. So, what about a post-Gricean approach? In Carston, Robyn (2002: 221–264), it is clearly assumed that the pragmatic meaning of *and* is the result of a pragmatic enrichment at the level of explicature, and not a contribution of the connective, whose semantics is limited to its logical deductive rules. There is then a clear difference between logical connectives and discourse connectives, as Carston claims (2002: 255):

> Among the English connectives which have been argued to encode procedures are 'but', 'moreover', 'after all', 'so', although' and 'whereas'. One of the preliminary observations often made in discussions of these examples is that they did not contribute to the truth-conditional content of utterances in which they appear. For any one of these cases, call it *c*, an utterance of '*P, c Q*' is true if and only if *P* is true and Q is true. In other words, a truth-statement for these cases would be identical to the truth-statement of an 'and'-conjunction.

However, Carston (2002: 256–257) envisages the possibility that *and* could have a procedural meaning:

> Let's entertain the possibility that the information encoded by 'and' is procedural. Before considering what that procedure might be, recall what a procedural encoding is supposed to do. It doesn't contribute a constituent to a representation, as a conceptual encoding does; rather, it constraints or facilitates some aspect of the pragmatic inferential phase of interpretation. [. . .] So, if 'and' encodes a procedure, it must amount to something like 'treat the propositions I connect as a single unit for pragmatic processing'. [. . .]
>
> However, there are strong reasons to doubt that a procedural account is right. The proposal given is the only plausible possibility, but it looks very much as if it is redundant, since the formation of a single unit of coordinated parts is already achieved through the syntax. [. . .]
>
> However, once we drop the untenable assumption that a pragmatic inference inevitably results in an implicature, it becomes pretty clear that these 'and'-enrichment have to be taken as contribution to the explicit content of the utterance.

In other words, the pragmatic meaning is achieved by a pragmatic enrichment, at the level of explicature. Carston goes a step further, allowing for the reconsideration of "other cases of alleged generalized implicature, including the well-known scalar implicature cases". She gives the examples of *some*, implicating "not all", numerals, *n* implicating "no more than *n*", and *or*, implicating "not and". As pragmatic enrichment of *and* is the result of a free enrichment at the level of explicature, *or* will contribute to the explicit meaning of the utterance, with its "not-and" meaning. To take her example, repeated here in (448a), her implicature (448b) would be reinterpreted as the explicature (448c):

(448)a. *Sarah is a poet or a philosopher*.
b. Implicature: Sarah isn't both a poet and a philosopher
c. Explicature: It is not the case that Sarah is both a poet and a philosopher

However, what makes this explicature-based analysis problematic is that (448c) cannot be the explicature of (448a). In effect, (448c) gives an incorrect truth-conditional analysis: if Sarah is a poet or a philosopher, then she cannot be neither

a poet nor a philosopher. But this is exactly what is predicted by the truth table of the negation of the conjunction, as Table 49 (repeated from Table 47) shows:

Table 49: Truth table of ¬ (P ∧ Q).

P	Q	P ∧ Q	¬ (P ∧ Q)
1	1	1	0
1	0	0	1
0	1	0	1
0	0	0	1

In my estimation, this is a very strong argument against *or*-explicature analysis. But it leaves the *or*-meaning issue open, as – whether or *not* (*P and Q*) has the status of explicature or implicature – it does not encompass its pragmatic meaning. Regardless, no acceptable solution for *or* meaning is provided by a post-Gricean theory of logical connectives.

The last issue is the pragmatic meaning of *if*. The same line of reasoning can be applied here: in contrast to an implicature analysis, *if* could be analysed as contributing to the explicature of the utterance, although in such a case it would be difficult to explain the modal clausal implicature, as well as the difference between the expected interpretation in the indicative vs. subjunctive moods of the antecedent. Again, there does not seem to be a consistent and homogeneous treatment of logical connectives according to a post-Gricean approach.

What is at stake is, in fact, the semantic nature of logical connectives. Are they intrinsically different from discourse connectives, or are they functors yielding a proposition with two propositions as arguments? This is the topic of Section 4.

4 Logical vs. discourse connectives

It is well-known that logical connectives can be distinguished from discourse connectives because the former are truth-functional where the latter are not. Carston makes another distinction between *truth-functional* connectives (like *but, moreover, after all, so, although* and *whereas*), which have the same truth conditions as *and*, and *truth-conditional* connectives (like *because, after, before* and *when*), "for which it is not possible to give a complete truth-table, as no truth value can be computed on the basis of just the information that each of

their constituent propositions is true". Is this distinction consistent with linguistic data?

It was shown that *because* cannot ensure the truth of its first discourse segment, due to its epistemic (or inferential) and speech act usages. As for *when*, it can have temporal-conditional uses which do not ensure the truth of the antecedent. (449) seems to have the same truth conditions as the ordinary conditional with *if* in (450):

(449) *When Peter comes to a party, Mary leaves.*

(450) *If Peter comes to a party, Mary leaves.*

However, *after* is a factive connective: in (451), both events *I left the apartment* and *I checked the oven* are true. So, (451) has exactly the same truth-conditions as (452):

(451) *I left the apartment after I checked the oven.*

(452) *I checked the oven and I left the apartment.*

The situation with *before* is more complex (Delfitto 2013), since there is a non-factive implicature with the *before*-clause:

(453) a. *I checked the oven before I left.*
b. Implicature: I did not check the oven for any moment before my departure

So, if *when* and *before*, like *because*, are truth-conditional connectives not ensuring the truth-value of the propositions connected, *after* is clearly a truth-functional connective (a factive connective like *and*).

In Relevance Theory (Sperber and Wilson [1986] 1995), logical connectives like *and, or* and *if* are described as concepts whose meaning is characterised in terms of deductive elimination rules. The core idea of this analysis is that logical rules are decompositional rules: they have a complex concept as an input and a simpler description as an output. So a deductive rule, in this sense, is of the form given in (454):

(454) Input: (X – C – Y)
Output: (X – C' – Y)

For instance, the meaning of the concept MOTHER is given by the following eliminative rule:

(455) *Mother-elimination rule* (Sperber and Wilson [1986] 1995: 90)
Input: (X – mother – Y)
Output: (X – female parent – Y)

When it comes to logical connectives, elimination rules like *and*-elimination for *and, modus ponendo ponens* for *if*, and *modus tollendo ponens* for *or* are given as examples of logical elimination rules whose function is to eliminate the connective:

(456) *And-elimination*
a. Input: (P and Q)
Output: P
b. Input: (P and Q)
Output: Q

(457) *Modus ponendo ponens*
Input: (i) P
(ii) (if P then Q)
Output: Q

(458) *Modus tollendo ponens*
(a) Input: (i) (P or Q)
(ii) (not P)
Output: Q
(b) Input: (i) (P or Q)
(ii) (not Q)
Output: P

As these definitions show, the output of the elimination rule is an atomic proposition. The elimination deductive rules are either analytical (when they have only one premise as input, as with *and*-elimination) or synthetic (when they have two premises as input, as with *modus ponendo ponens* for *if* and *modus tollendo ponens* for *or*).

Logical languages, like propositional calculus, are informal systems that also contain *introduction* rules whose function is, starting from an atomic proposition, to build a complex proposition containing a logical connective, as in (459)–(461):

(459) *And-introduction*
Input: (i) P
(ii) Q
Output: (P and Q)

(460) *Or-introduction*
Input: P
Output: (P or Q)

(461) *If-introduction*
Input: P . . . Q (Q is deduced from P and other propositions)
Output: (if P then Q)

However, these rules are problematic for the human deductive and inferential system, mainly as they give rise to an indefinite application of the rule (Sperber and Wilson [1986] 1995: 96):

> In informal systems, the existence of such [introduction] rules creates no serious problems, because it is left to the intelligent user to decide which line of reasoning to pursue, and when to abandon it. However, in a formal system of the type just described,[1] the assumption is that although the rules may be accessed and tested in a certain order, every rule applies obligatorily whenever it is accessed and its input description is met. In such a system, each of the above [introduction] rules, once set in motion, would reapply indefinitely to its own output, and the derivation would never stop.

Suppose that you start your inferential process with *P*. As you can write and use the system's memory, you can iterate *P*, and with *P* and *P*, infer (*P and P*). With *P* and (*P and P*), you can in turn infer (*P and* (*P and P*)), and so *ad libitum*, as in (462):

(462) (i) P
(ii) (P and P)
(iii) (P and (P and P))
(iv) (P and (P and (P and P))) etc.

1 "The device we envisage is an automaton with a memory and the ability to read, write and erase logical forms, compare their formal properties, store them in memory, an access the deductive rules contained in the logical entries for concepts" (Sperber and Wilson 1986 [1995]: 94–5).

Assuming that our human computational cognitive system is only made of deductive elimination rules attached to concepts, then some of these concepts are logical constants, which is to say logical connectives. And assuming that logical connectives are words of the language of thought (Reboul 2017a), it can then be assumed that these concepts necessarily have linguistic counterparts in natural language. This explains why English has words like *and, or* and *if*, French words like *et, ou* and *si*, and so forth. This places us in the middle of the bridge. We know that the starting point – the bridge's entry – constitutes the concepts corresponding to logical constants, and the middle of the bridge their linguistic counterparts. But yet to be walked is the final, and most challenging, part of the journey: how can it be that at the destination, the bridge's exit, logical connectives receive added value which corresponds to their pragmatic meaning? This is the same issue as the reason for other types of connectives (that is, discourse connectives) in natural languages.

So, the question is why natural languages have discourse connectives beside logical ones. Several answers to this question have been given. First, connectives have a function at the level of the *coherence* of discourse: they are marks of cohesion (Halliday & Hasan 1976, Schiffrin 1987, Maschler and Schiffrin 2015 a.o.). The issue with the coherence approach is that it presupposes that discourse is a linguistic unit governed by rules of coherence, analogous to the syntactic rules governing sentences. However, this hypothesis has been refuted (Reboul and Moeschler 1998), as discourse is not a linguistic unit so much as a pragmatic unit whose interpretation is not reducible to compositional principles.

Second, a notable trend from Rhetorical Structure Theory (Mann and Thompson 1988) explains discourse as composed of *discourse relations* which are responsible for its coherence; connectives would play a role in determining discourse or rhetorical relations. However, as often observed, the absence of one-to-one relations between connectives and discourse relations is not just problematic for determining the relevant discourse relation; it is even more so when it comes to the interplay between connectives and discourse relations (see Taboada 2006 for a defence of such an approach).

A similar, third point – albeit with a different cognitive background – is that discourse connectives have been described as signals for cognitive coherence relations. As discussed in chapter 2, this approach, developed by Sanders, Ted and colleagues (see for instance Sanders, Spooren and Noordman 1992, Sanders and Nordmann 2000), distinguishes between basic operations, simple (additive) relations and complex (causal) relations, which can be either positive or negative, and temporally ordered or non-ordered. Discourse connectives encode these basic operations, and their function is mainly in information processing and recall – the more explicit the relation, the better the recall (Sanders 2005).

Fourth, discourse connectives have been interpreted in Relevance Theory as carriers of procedural meaning, which is mainly non-truth-conditional meaning (Blakemore 1987; 2002). The main function of discourse connectives is to guide the interpretation of the utterance, and to minimize the cognitive efforts implied in processing discourse. However, as argued in chapter 2, discourse connectives encode both conceptual and procedural meaning, and can also have truth-conditional meaning, as demonstrated in chapter 6. Moreover, if logical connectives are restricted to the domain of reasoning and inference, and discourse connectives to communication, the division of labour between these two main functions does not explain why reasoning would be restricted to basic logical operation, and not (as demonstrated in chapter 5) to causal connectives, for instance. This last line of argumentation is the general trend in research combining cognitive pragmatics, argumentation and reasoning. Sperber and Wilson ([1986] 1995) do not mention this point overtly, but one work on argumentation by Dan Sperber (2001) is clear enough.

> The next move in the evaluation-persuasion arms race was from the communicator's side and consisted in displaying the very coherence the audience might look for before accepting the message, a kind of "honest display" with many well-known analogs in animal interaction. [...] Displaying coherence requires an argumentative form, the use of logical terms such as "if", "and", "or" and "unless", and of words indicating inferential relationships such as "therefore", "since", "but", and "nevertheless". It is generally taken for granted that the logical and inferential vocabulary is – and presumably emerged as – a tool for reflection and reasoning. From an evolutionary point of view, this is not particularly plausible. The hypothesis that such terms emerged as tools for persuasion may be easier to defend.

In other words, aside from the reasoning function attributed to logical connectives, their main function is argumentation and persuasion. Mercier and Sperber (2017: 162–3) are relatively explicit on the pragmatics of logical connectives:

> Logical connectives (as well as quantifiers and modals) behave like ordinary words. They don't encode the communicator's intended meaning but merely indicate it. [...]
>
> Logical connectives, it turns out, can be used in the same way as discourse markers such as "therefore" and "but" to suggest implications that should be derived in the context even though they are not entailed by the literal meaning of the utterance.

Take a very simple example to illustrate this point. Clearly, logical connectives can introduce argumentations, as examples (463)–(465) show:

(463) Anne and Abi are talking about how to be dress for her party. Abi is not convinced by her mother's suggestion. Finally, Anne proposes: *And why not your green dress?*

(464) Jones and his boss have an issue about a complaint. His boss wants to stop the issue: *Mr. Jones, I advise you not to sue, or you will have serious problems with the company*.

(465) John and Paul have an argument in a bar. Their voices get louder and louder. John tells Paul: *Let's take this outside, if you are a man!*

In (463), Anne's intention is to convince Abi to wear her green dress, and the function of *and* is to signal to her that this proposal is the last resort and Anne has exhausted her proposals and imagination; this final proposal is presented not as the worst choice but as a very good alternative to the other proposals. In (464), *or* introduces the consequence of Jones' decision to sue, and is not presented as an alternative to his advice, nor an alternative to his choice to sue. Finally, in (465), the imperative is not an order but a threat, and the implication of the conditional *if you are a man* is "you are not a man if you won't take this outside", an entirely non-logical consequence. These examples show that logical connectives encompass rich pragmatic meanings in argumentation and are not restricted to their conceptual or logical meanings. If these forms of behaviour are ordinary pragmatic usages of logical connectives, how can it be explained that purely logical devices receive such enriched meanings? Do they actually behave as discourse connectives? To answer this question, I will address the issue of their conceptual and procedural meaning.

5 Do logical connectives have conceptual and/or procedural meaning?

The main issue is whether the mixed conceptual-procedural model can help to disentangle the issue of logical connectives. This chapter has argued that logical connectives are not restricted in their logical meaning, but receive several types of enrichment, contributing to the meaning of the utterance they connect; they introduce specific pragmatic relations which can be either more specific truth-conditional meanings (like *or* and *if*) or more specific pragmatic relations (such as temporal order or causality for *and*), or even contrast with such connectives. If it is acknowledged that these connectives contribute to such pragmatic meaning, there is still disagreement on whether these pragmatic meanings are linguistically – thus, semantically – encoded. In other words, is the causal meaning of *and* part of its meaning?

Chapter 6 answered this question in the affirmative; but in seeking to explain how and why different types of connectives could be compatible with the same

type of meanings (causal and inferential), it was considering a different type of issue. Here, the problem of the compatibility of a logical meaning with its specific pragmatic meaning is far thornier. A line of argumentation like Mercier and Sperber's could be used, making the bold claim that "logical connectives [. . .] behave like ordinary words" and that "logical connectives [. . .] can be used in the same way as discourse markers". But this is a simple observation, and evidence rather than explanation. This task is not so much explanatory as descriptive. For example, Luscher and Moeschler (1990: 89) attempted to describe the procedural meaning of *et* 'and', reducing all possible usages to eight meanings, which was more a descriptive exercise than a theoretically grounded explanation.

What I advocate for logical connectives here goes beyond a Gricean or a post-Gricean analysis, neither of which attributes responsibility for the connective's pragmatic meaning to the connective itself; on this point, see Carston's position, that "there are strong reasons to doubt that a procedural account is right". My position will capitalize on the distinction between conceptual and procedural meaning; as suggested in chapter 6, by making a clear difference between entailment, explicature and implicature, the logical meaning of connectives is restricted to entailments and truth conditions, with their pragmatic enrichments added at the level of implicature and explicature. *And* will receive a temporal enrichment at the level of explicature, and a causal enrichment at the level of implicature, both being its conceptual meaning; its procedural meaning will specify the direction of the temporal and causal meaning.[2] The previous analysis in chapter 6 can thus be fleshed out:

(466) *A complete analysis of P and Q*

a. conceptual meaning

1. entailments	P, Q
2. explicature	X PRECEDES Y
3. implicature	POSSIBLE[X CAUSE/EXPLAINS Y]

2 Blochowiak and Castelain (2018) have shown experimentally for French that temporal interpretations of et 'and' receive significantly shorter reading times than causal interpretations. Their proposal is to treat both types of interpretations as explicatures which are not independent one of another, in the sense that for a hearer to arrive at a causal interpretation, a temporal sequence of events has to be inferred first. So, in the case of temporal interpretation, one explicature has to be derived, while in the case of causal interpretation, two explicatures have to be computed. Blochowiak and Castelain (2018) results are also compatible with the view I present here, according to which temporal interpretations are explicatures whereas causal interpretation belongs to implicatures.

c. procedural meaning
   1. temporal reading P PRECEDES Q
   2. causal reading P CAUSE Q
   3. inferential reading Q EXPLAINS WHY THE SPEAKER SAYS P

Or needs an extra-context in order to entail one of the disjuncts; however, any serious attempt to accommodate the ignorance inference (Fox 2007) precludes any disjunct being inferred at the level of implicature. The ignorance inference is therefore obtained at the level of implicature, and the scalar implicature is one contextual assumption, and no longer an implicature by which the exclusive meaning is inferred. In other words, the exclusive meaning is obtained by an inference from the basic logical meaning and the contextual assumption "not-and", and the ignorance inference is a consequence, as an implicature, of the exclusive reading. No procedural meaning is obtained, unless *or* is not followed by a complete proposition, implying the search for an alternative, as in (467). This is particularly frequent in the use of *ou bien* 'or not' in Swiss French alternative questions, functioning as a tag-question:

(467) a. *Tu viens ou bien?*
   you come or well
   'Are you coming, or what?'
   b. Implied meaning: are you coming or are you not coming?

The complete analysis is given in (468):

(468) *A complete analysis of P or Q*

a.	entailment:	(P or Q) or (P and Q)
b.	contextual assumption:	not (P and Q)
c.	implicated conclusion:	(P or Q) and not both
d.	ignorance implicature:	S does not know that P is true, and that Q is true

As for *if*, the main criterion is the mood of the antecedent. If the mood is indicative, the implicature is that the consequence is possible, by way of a contextual premise that the antecedent is possible; if subjunctive, evidence of the consequence's negation allows us to infer the antecedent's negation not as a possibility but a certainty. But surprisingly, here, procedural meaning can be attributed

to the direction of inference: from the antecedent to the consequent in the indicative mood, and from the consequent to the antecedent in the subjunctive mood. Again, if this analysis makes sense – and procedural meaning is about the direction of the relation – the conditional relation would be:

(469) *A complete analysis of if P, Q*

a. indicative mood

(i)	explicature:	if P, Q
(ii)	contextual assumption:	P
(iii)	implicated conclusion:	Q

b. subjunctive mood

(i)	explicature:	if P, Q
(ii)	contextual assumption:	not-Q
(iii)	implicated conclusion:	not-P

In a nutshell, what these analyses confirm is the compatibility of logical and pragmatic meaning: logical connectives are connectives which evolved for purposes other than demonstrative inference, and, as with all other discourse connectives, have non-demonstrative inference usages. This explains, at least in part, the French adage that *avec des si, on mettrait Paris dans une bouteille* 'you could bottle Paris with enough ifs', meaning that "if all antecedents introduced by *if* were true, impossible facts would be true"; in other words, conditional meaning is viewed from such a common-sense perspective as letting imagination win over facts!

6 Conclusion

This chapter addressed the issue of logical connectives, their logical and pragmatic meanings, and their function: are they limited to reasoning, or do they play a role similar to that of discourse connectives? Following the general approach to argumentation and connectives given in Mercier and Sperber (2017), I adopted an inclusive perspective making no intrinsic difference between discourse and logical connectives. I have also tried to provide explicit semantics and pragmatics for logical connectives, narrowing the semantics to their entailments and describing their pragmatics, expressed in terms of conceptual meaning, as the result of pragmatic inferences. Last but not least, procedural meaning has been restricted to the direction (temporal, causal or conditional) of the relation for *and* and *if*.

This makes it possible to explain the close relation between the logical semantics and the pragmatics of logical connectives. However, such a close

semantics-pragmatics interface has yet to be confirmed by discussing the semantic and pragmatic meanings of negation. Chapter 8 will put forward a parallel conclusion: different meanings can be derived from a univocal and logical truth-conditional meaning of negation. It is vital to establish this, as that which has been described as meaning variation can then be reinterpreted according to the semantics-pragmatics interface at the heart of this book since Chapter 1.

8 Descriptive and metalinguistic negation

1 Introduction

Chapter 7 discussed the issue of logical connectives, and in particular the relation between their logical and pragmatic meanings. The reason why such connectives are expressed in natural languages, as counterparts of logical connectives, cannot just be explained in terms of their function in reasoning. Here, I have assumed Mercier and Sperber's position, assigning to logical connectives the same function as discourse connectives, which is to say argumentation and persuasion.

The challenge of the current chapter is to explain how negation, defined semantically as a truth functional operator inverting the truth value of its argument, can receive pragmatic functions. It will first focus on the possible functions of negation in discourse, showing that whatever function negation can be used for, its primary truth-conditional meaning remains backstage (section 2). The next step will be to explain why negation can have metarepresentational uses; I will argue that metalinguistic uses of negation have representational (that is, truth-conditional) effects (section 3). Section 4, based on Moeschler (2013b, 2018a), proposes a set of criteria to disentangle descriptive (truth-conditional) usages of negation from metalinguistic usages; a defence of a monoguist approach to negation (Horn 1985) will provide a fuller picture of the phenomenon. While section 5 will address the role of discourse connectives in disambiguating negation (proposing a semantic and pragmatic analysis of the French connective *mais* connected to the two uses of negation, descriptive and metalinguistic), section 6 addresses the issue of some ambiguist approaches (at the semantic and pragmatic levels), contrasting with the monoguist approach advocated in this book. Finally, the conclusion addresses the type of meaning (conceptual vs. procedural) encoded by negation.

2 The function of negation in discourse

One of the first questions about negation is its function. What is crucial here is that negation is rarely used out of the blue. What does this mean for the relevance of an utterance like (470)?

(470) Jacques to Anne: *Your sister is not coming this summer*.

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What Jacques refers to is the reverse positive utterance, which is supposed to belong to the common ground, as in (471):

(471) *Your sister is coming this summer.*

(471) must belong to the common ground, because if Anne is unaware that her sister is coming this summer, then the relevance of uttering (470) can be questioned, as in (472):

(472) *Was she supposed to come?*

However, (471) can be neither a presupposition nor an entailment of the question:

(473) *Is your sister coming this summer?*

So, there is a kind of paradox in negative utterances: a negative utterance refers to its positive counterpart, but this positive counterpart is not a presupposition. If it is not a presupposition, what could it be? Otherwise put, what is the relation between the negative utterance (NEG) and its positive counterpart (POS)? As the next section will show, the relation is multiple, and depends mainly on the type of negation: when negation is descriptive (474a), POS is entailed under negation (574b); when metalinguistic, as in (475a), POS is entailed by the corrective clause (COR) (475b); and finally, when negation scopes over the presupposition, as in (476a), POS is also under the scope of negation (476b):

(474) a. *Abi is not beautiful.*
b. Abi is not beautiful → ¬ (Abi is beautiful)

(475) a. *Abi is not beautiful, she is gorgeous.*
b. Abi is gorgeous → Abi is beautiful

(476) a. *Abi does not regret having failed her exams; she passed.*
b. Abi passed → ¬ (Abi regrets (having failed)) and ¬ (Abi failed her exam)

So, there is a strong connection between NEG and POS. POS is either entailed, or under the scope of negation. As it stands, it is not a presupposition, but belongs to the common ground.

Is there evidence that POS has a cognitive foundation, and is thus cognitively active in the context of utterance? A series of experiments led by Barbara Kaup (see Lüdtke et al. 2008 a.o.) suggests that such an activation of POS can

occur. In the latter paper, the participants' task was to look at four pictures and make truth-judgment values for the situations they depicted: true affirmative (*In front of the tower there is a ghost*; ghost depicted), false affirmative (*In front of the tower there is a ghost*; lion depicted), true negative (*In front of the tower there is no ghost*; lion depicted) and false negative (*In front of the tower there is no ghost*; ghost depicted).

It is interesting that *false negatives* are recognized earlier than true negatives; for the fourth situation, it implies that the relation between the presence of a ghost in the picture and the negation of the ghost's existence makes more sense than the representation of a lion in front of the tower and the negation of the ghost's existence. What conclusion can be drawn from this? Even if the linguistic stimulus is the contrast between *ein* 'a' and *kein* 'no' in German – morphologically integrated negation, rather than syntactic negation vs. a positive sentence – a negative utterance makes reference to its positive counterpart. Confirmation of this experimental study comes from Scappini et al. (2015: 45), corroborating the non-incremental approach:

> The results that emerge from the behavioral data and from the statistical elaboration of the collected EEG [ElectroEncephaloGraphy] data concerning normally-developed adults provide substantial confirmation for the existence of a first stage of processing in which negation is still not integrated (thus for a non-incremental model of negation processing), though they also suggest that the mental representations created at the different stages of processing are dynamically compared in the course of the whole process rather than being sequentially produced and suppressed.

In other words, the processing of a negative sentence has two stages. The psycholinguistic model that emerges from these studies is that negative utterances are processed in a non-incremental way: first, POS is accessed, with NEG assessed second. This is a preliminary but relevant result: when NEG is processed, POS is available first. This means that, in the context in which NEG is interpreted, POS is accessible, explaining why NEG cannot appear out of the blue, and why POS must be in the common ground. Nonetheless, it is possible to imagine a negative utterance which could hardly be related to POS, like the example given by Ducrot (1984: 217):

(477)	*Il*	*n'*	*y*	*a*	*pas*	*un*	*nuage*	*dans*	*le*	*ciel.*
	3SG-PRO	NEG	PRO	HAVE-3SG	NEG	a	cloud	in	the	sky

'There isn't a cloud in the sky.'

Is it reasonable to imagine that the context in which (477) is uttered supposes that the speaker's interlocutor has uttered something like *There is a cloud in the*

sky? Such a supposition does not make sense, because what the speaker wants to say is that the sky is blue. So, the minimal question is why the speaker has not used a positive utterance like (478):

(478) *The sky is blue*.

Consider for a moment how a sky can be. At my latitude, in a small village in South Burgundy, the latitude is 46 degrees north, with a longitude of 4 degrees east. At this latitude, the sky is rarely completely blue, and it is more surprising for there to be no cloud in the sky. So, what the speaker says is just a fact expressing an extraordinary situation. But even in this interpretation, is the negative statement disconnected from the corresponding affirmation? Ducrot says no, leading him to distinguish three types of negation (Ducrot 1984: 217–218):

1. I call "metalinguistic" any negation contradicting the terms of the effective speech to which it is opposed. [. . .] It is this "metalinguistic" negation which allows, for instance, the presupposition of the corresponding positive to be cancelled, as is the case in "Pierre did not stop smoking; in fact, he never smoked in his life". [. . .]
2. I now reserve the term "polemic" to negation [. . .] which corresponds to "most negative utterances". Here, the speaker of "Pierre is not intelligent", by assimilating with the enunciator E_2 of the refusal, opposes himself not to a speaker but to an enunciator E_1 whom he has introduced into his discourse, but who cannot be assimilated with the author of no effective discourse. [. . .] This "polemic" negation always has a lowering effect, and preserves the presuppositions.
3. As a third form of negation, I maintain my old idea of descriptive negation [. . .]. I simply add that I take it as a delocutive derivation of polemic negation. If I can describe Pierre by saying "He is not intelligent", it is because I attribute to him the property which would justify the speaker's position in the underlying crystallised dialogue to the polemic negation: saying that someone is not intelligent is attributing to him the (pseudo-)property which would justify opposing himself to a enunciator having asserted that he is intelligent".[1]

1 "1. J'appellerai "métalinguistique" une négation qui contredit les termes mêmes d'une parole effective à laquelle elle s'oppose. [. . .] C'est cette négation "métalinguistique" qui permet par exemple d'annuler les présupposés du positif sous-jacent, comme c'est le cas dans "Pierre n'a pas cessé de fumer; en fait, il n'a jamais fume de sa vie".

2. Je réserve maintenant le terme de "polémique" à la négation [. . .] [qui] correspond à "la plupart des énoncés négatifs". Ici, le locuteur de "Pierre n'est pas intelligent", en s'assimilant à l'énonciateur E2 du refus, s'oppose non pas un locuteur, mais à un énonciateur E1 qu'il met en scène dans son discours même et qui peut n'être assimilé à l'auteur d'aucun discours effectif. [. . .] Cette négation "polémique" a toujours un effet abaissant, et maintient les présupposés.

3. Comme troisième forme de négation, je reprends mon ancienne idée de négation descriptive [. . .]. J'ajouterai simplement que je la tiens pour un dérivé délocutif de la négation polémique. Si je

What Ducrot calls *metalinguistic* and *polemic* negations always refer to a previous POS, uttered or not. Even descriptive negation makes an indirect reference to a previous discourse, but this reference is interpreted as a delocutive property of the negative utterance, where delocutivity is the property of referring to the act of saying. Many such expressions come from French, such as *un m'as-tu vu* 'a did-you-see-me', *un j'm'en foutiste* 'an I-don't-care', and *une Marie couche-toi là* 'a Mary-lie-down-there', respectively meaning someone who boasts, someone who does not care about anything, and a girl of loose morals.

Below, I will merge Ducrot's polemic and descriptive negation, and make a straightforward distinction between descriptive and metalinguistic negation. However, I extend the domain of metalinguistic negation, including the negation of an implicature, as in (479):

(479) a. *You did not eat some cookies, you ate all of the cookies.*
b. ¬ [you ate only some cookies]

It is now clear that negation has several functions: it can simply oppose a previous utterance, it can oppose a presumed utterance recorded in the common ground, or it can oppose a presupposition or an implicature. The main goal of this chapter is to explain how negation can have these functions.

That said, what does negation mean? Can negation simply be said to mean "it is false that" or "it is not that case that"? What about illocutionary forces like *I object, I refute* and *I deny*? In other words, is negation a marker of illocutionary force? Moeschler (1982) adopts such a position within a general framework of discourse structure (Moeschler 2002b). But if negation is associated with an illocutionary act, it does not seem to behave like other types of illocutionary force markers. For instance, in Austin's 12th lecture (Austin, John L. 1962: 162), the list of *expositive* performative verbs includes in the first category – besides *affirm, state, describe, class* and *identify* – the verb *deny*. *Object* and *refute* do not appear in his list. On the other hand, in *A taxonomy of illocutionary acts*, a chapter from Searle (1979), the category of *assertives* – corresponding broadly to Austin's expositives – is described as follows: "The point or purpose of the members of the assertive class is to commit the speaker (in varying degrees) to something's being the case, to the

peux décrire Pierre en disant "Il n'est pas intelligent", c'est que je lui attribue la propriété qui justifierait la position du locuteur dans le dialogue cristallisé sous-jacent à la négation polémique: dire de quelqu'un qu'il n'est pas intelligent, c'est attribuer la (pseudo-) propriété qui légitimerait de s'opposer à un énonciateur ayant affirmé qu'il est intelligent."

truth of the expressed proposition. [. . .] The direction of fit is words to the world; the psychological state expressed is Belief (that *p*)" (Searle 1979: 12). No mention of negative verbs like *deny*, *object* or *refute* is made.

However, the status of performative verbs such as *deny* can be questioned. The main test for performativity is indirect speech: a verb is performative if its occurrence in the first-person singular of the indicative present can be reported in indirect speech. As such, a speaker's saying "I V_{perf} that *P*" can be reported as "the speaker has V_{perf}-ed that *P*". For instance, (480a) can be reported as (480b):

(480) a. *The speaker said: "I promise to come to your party tomorrow".*
b. *The speaker promised to come to her interlocutor's party tomorrow.*

Is it sufficient to say *I deny*, *I object*, or *I refute* to deny, object or refute? In the case of *refute*, refutation supposes not only that *I refute* is said, but also an explanation of the refutation giving arguments. In case of a denial, *I deny that p* can be sufficient, as can *I object that p*.

(481) a. *The speaker said: "I refute this allegation".*
b. # *The speaker has refuted his allegation.*

(482) a. *The speaker said: "I deny having killed my boss".*
b. *The speaker has denied having killed her boss.*

(483) a. *The speaker said: "I object that I have eaten all of the cookies*".
b. *The speaker has objected that he has eaten all of the cookies.*

As will be argued in next section, the *I object that P* formula can be interpreted as an illocutionary act. But a negative utterance like *I object that P* is a typical paraphrase for metalinguistic negation, not for descriptive negation. The main issue is whether, by using an explicit negation, the speaker is denying, objecting or refuting. So, could the illocutionary force of an example like (484) be something like (485)?

(484) *Abi is not ugly.*

(485) a. *I deny that Abi is ugly.*
b. *I object to the idea that Abi is ugly.*
c. *I refute that Abi is ugly.*

However, what the speaker refers to is something that makes explicit neither the attitude of the speaker nor his illocutionary force (Searle 1979), but the truth-conditional status of the proposition expressed, as in (486):

(486) It is false/not the case that Abi is ugly.

One forceful argument can be made. When the performative reading is given, an explanation is expected: why is it the case that the speaker denies, objects to or refutes a proposition? What is expected is an explanatory connective like *because: I object to the idea that Abi is ugly*, *because she is the most beautiful girl I know*. But this interpretation of (484) is strange. Indeed, (487b) is more expected than (487a), because by saying (484), what is at play is the truth or the falsehood of the proposition:[2]

(487) a. *Abi is not ugly, because she is the most beautiful girl I know*.
b. *Abi is not ugly, but she is the most beautiful girl I know*.

If (484) is interpreted as (487a), then the understanding of this negative sentence is necessarily *metarepresentational*. On the other hand, if (484) is interpreted as (487b), its meaning is not metarepresentational. However, one type of negative utterance has a metarepresentational meaning and can be interpreted with the performative *I object*, as in (488):

(488) *Abi is not beautiful, she is gorgeous*.

(488) does not receive the reading (489), but the reading (490), which is a metarepresentational reading:

(489) It is not the case that Abi is beautiful, but gorgeous.

(490) I object to the idea that Abi is beautiful, because she is gorgeous.

My analysis is therefore that descriptive negation is representational, and its paraphrase is "it not the case that *P*"; metalinguistic negation is metarepresentational, and paraphrased as *I object to the idea that P*. In the case of

2 Searle (1979: 12) has made this explicit: "The point or purpose of the members of the assertive class is to commit the speaker [. . .] to something's being the case, to the truth of the expressed proposition".

descriptive negation, the connective introducing the corrective clause (COR) is *but*. However – and this will be the main topic of section 5 – the connectives for the two types of metalinguistic negation, scoping over an implicature vs. a presupposition, can be proven not to be the same: the former takes *but*, and the latter *because*. Before that, it must be made clear what metalinguistic negation is.

3 A representational analysis of metalinguistic negation

Metalinguistic negation has given rise to a lot of work and analysis (Horn 1985, 1989; Carston 1996, 2002; Moeschler 1997, 2010b, 2013b, 2018a, 2019a, a.o.). Most of this assumes two properties: first, metalinguistic negation is metarepresentational; second, it is not truth-conditional. The first property is best illustrated by examples like those in (491) (Wilson 2000):

(491) a. *Around here we don't eat tom[eiDouz] and we don't get stressed out. We eat tom[a:touz] and we get a little tense now and then.*
b. *Mozart's sonata weren't for violin and piano, they were for piano and violin.*
c. *I didn't manage to trap two mongeese: I managed to trap two mongooses.*

In each case, there is no state of affairs which is assessed as false; the examples correct pronunciation (*tom[a:touz]* vs. *tom[eiDouz]*), the order of an established expression (*piano and violin* vs. *violin and piano*) or the incorrect plural of a noun (*mongooses* vs. *mongeese*). As such, none of these negative utterances is truth-conditionally false: they are just inappropriate ways of saying how things are, and thus cannot but be *metarepresentational*. They are analysed along the lines of (492):

(492) a. [$_{R1}$*we do not say* [$_{R2}$*around here we eat tom[eiDouz] and we get stressed out*]]
b. [$_{R1}$*we do not say* [$_{R2}$*Mozart's sonata were for violin and piano*]]
c. [$_{R1}$*we do not say* [$_{R2}$*I managed to trap two mongeese*]]

Horn (1985: 136) gives the following analysis of metalinguistic negation: "What I am claiming for negation [...] is a use distinction: it can be a descriptive truth-functional operator, taking a proposition *p* into a proposition *not-p*, or a metalinguistic operator which can be glossed "I object to *u*", where *u* is a crucially a

linguistic utterance rather than an abstract proposition". What is interesting in his definition is that it is not, strictly speaking, a metarepresentational analysis of metalinguistic negation, but a speech act analysis, objecting being an expositive performative verb. The speaker is *objecting* to *u* – here, to the way words are pronounced, expressions are formulated, or plural forms are realized. As objecting *u* means *I cannot say u*, (491) receives the analysis (493):

(493) a. I cannot say that around here we eat tom[eiDouz] and we get stressed out.
b. I cannot say that Mozart's sonata were for violin and piano.
c. I cannot say that I did manage to trap two mongeese.

In such an analysis, the corrective clause COR is the justification for this objection. So, the complete analysis is in (494):

(494) a. I cannot say that around here we eat tom[eiDouz] and we get stressed out, because we eat tom[a:touz] and we get a little tense now and then.
b. I cannot say that Mozart's sonata were for violin and piano, because they were for piano and violin.
c. I cannot say that I did manage to trap two mongeese, because I managed to trap two mongooses.

Horn's analysis is therefore a pragmatic and *monoguist* description for negation, and not a semantic one (*ambiguist* in his terms) where negation would receive two meanings – truth-conditional and non-truth-conditional, or narrow scope vs. wide scope. This distinction in use is in line with Grice's recommendation in proposing his famous Modified Occam's Razor (Grice 1978: 118–119): "*Senses are not to be multiplied beyond necessity*". This position was first adopted in Gazdar (1979) when he analysed the behaviour of presupposition under negation. When comparing the preservation of presupposition and its cancellation, he claims that "proponents of semantic presupposition are forced to postulate an ambiguity in natural language negation in order to simultaneously capture the presupposition [495] [. . .] and the absent of the relevant presupposition in [496]" (Gazdar 1979: 91):

(495) *John doesn't regret that he failed*.

(496) *John doesn't regret having failed, because, in fact, he passed*.

Gazdar (1979: 92) concludes that "there is no independent motivation for treating natural language negation as ambiguous, and there are no grounds for thinking that natural language negation is semantically distinct from the bivalent operator found in the propositional calculus". As argued in chapter 7, negation semantics is truth-functional, and can be represented in the following truth table (Table 50).

Table 50: A truth table for negation.

P	¬P
1	0
0	1

So why is such an analysis incompatible with the classic logical analysis of definite description by Russell (1905)? In effect, Horn (1985) qualifies this type of analysis as ambiguist, even though negation is the same logical operator having different scopes (internal vs. external). Take the famous example of the king of France:

(497) *The king of France is not bald*.

(497) can receive two readings: one with internal negation (498) and the other with external negation (499), which is relevant for (500) (see also chapter 1):

(498) $\exists x\,[King(x) \wedge \neg\exists y[King(y) \wedge (y \neq x)] \wedge \neg bald(x)]$

(499) $\neg\exists x\,[King(x) \wedge \neg\exists y[King(y) \wedge (y \neq x)] \wedge bald(x)]$

(500) *The king of France is not bald, because there is no king of France*.

In this analysis, the effect of negation depends on its scope: with internal negation, the presupposition is preserved, as in (501), whereas with external negation, it is cancelled.

(501) a. There is a unique king of France
b. $\exists x\,[King(x) \wedge \neg\exists y[King(y) \wedge (y \neq x)]]$

However, in terms of the scope of negation, this analysis says nothing about the contrast between (495) and (496). It seems that the cancellation of a

presupposition in (496) is not the result of a wide scope, but the result of the entailment of the corrective clause, as shown in (502):

(502) *John passed* → ¬ [John failed] ∧ ¬ [John regrets]

Moreover, the scope of explanation is restricted to existential presuppositions (in the king of France example) and cannot be extended to lexical presuppositions, such as the scope commanded by factive verbs. The issue of metalinguistic negation is yet more complex because other cases have been discussed (Horn 1989) in which negation scopes over a scalar implicature. Here is a set of examples given by Horn:

(503) *He doesn't have three children, he has four.*

(504) *You didn't eat some of the cookies, you ate all of them.*

(505) *It isn't possible she'll win, it's downright certain she will.*

(506) *John isn't patriotic or quixotic, he's both patriotic and quixotic.*

In (503), negation cancels the scalar implicature of POS, which is that "I have only three children"; in (504), the scalar implicature "you didn't eat all of the cookies" is defeated; in (505), the implicature "it is not certain that she will win" is also defeated; finally, in (506), the implicature "John is not patriotic and quixotic" is defeated, too. In all cases, what negation cancels is the negation of POS implicature. It will have to be explained how this is the case; but before that, the difference between descriptive and metalinguistic negation must be made clearer, which is the topic of section 4.

4 A set of criteria to disentangle descriptive and metalinguistic negation

Moeschler (2013b, 2018a) argued for a set of criteria to disentangle the issue of negation. What have so far been discussed are two types of uses of negation, descriptive and metalinguistic, and two types of uses of metalinguistic negation, besides the original metarepresentational uses (494): first, negation cancels a presupposition; second, negation cancels an implicature. These usages are metalinguistic: they both cancel not the proposition expressed, but the implicit content which is either semantically encoded

(presupposition) or pragmatically conveyed (implicature) – that is, non-truth-conditional aspects of meaning. Using both the metarepresentational and the speech act analyses, the following analyses for examples (507) (cancellation of a presupposition (509)) and (508) (cancelation of a scalar implicature (510)) are obtained:

(507) *Abi does not regret having failed, because she passed.*

(508) *Abi is not beautiful, she is gorgeous.*

(509) a. [it is not the case that [Abi regrets having failed]]
b. I object to the idea that Abi regrets having failed, because she passed.

(510) a. [it is not the case that [Abi is beautiful]]
b. I object to the idea that Abi is beautiful, because she is gorgeous.

However, these analyses do not account for the effect of negation (the cancellation of both the presupposition and the implicature), as (511) and (512) show:

(511) Abi passed → ¬ [Abi failed]

(512) Abi is gorgeous → ¬ [Abi is more than beautiful]

Here we face a kind of paradox: where descriptive negation is truth-conditional (making the proposition under negation false), metalinguistic negation is supposedly non-truth-conditional. However, the analysis in (511) and (512) shows that metalinguistic negation has truth-conditional effect. When the predicate under negation is scalar and the corrective clause asserts the upper-bound predicates, then metalinguistic negation cancels the scalar implicature of the positive clause (POS); when the predicate under negation is a hole (like a factive predicate) followed by a corrective clause (which is the negation of the presupposition), then the presupposition is cancelled. So, surprisingly, metalinguistic negation has truth-conditional effects, as summarized in Table 51:

Table 51: Truth-conditional effects of metalinguistic negation.

types of negation	assertion	entailment	presupposition	implicature
MN1	~~not P~~	P and not-Q		~~Q~~
MN2	not-P		~~Q~~	

MN1, which corresponds to the negation of an implicature, cancels the negative clause (~~*not P*~~), because what is entailed is the proposition *P* (POS) and the negation of POS implicature (*Q*), which is erased (~~*Q*~~). (513) makes this clear:

(513) a. *Abi is not beautiful, she is gorgeous*.
b. what is asserted: ~~Abi is not beautiful~~
c. what is entailed: Abi is beautiful, and it is not the case that Abi is not more than beautiful
d. implicature: ~~Abi is not more than beautiful~~

In MN2, which corresponds to the presuppositional negation, what is asserted is the negation of the proposition (*not-P*) and the presupposition of the assertion (*Q*) is cancelled (~~*Q*~~), as laid out in (514):

(514) a. *Abi does not regret having failed, because she passed*.
b. what is asserted: Abi does not regret having failed
c. what is presupposed: ~~Abi failed~~

Table 51 clearly shows that there is more than one metalinguistic usage of negation. Having shown that there are two types of metalinguistic negation, the question is how to make this distinction objective. I will propose a set of criteria, based on Moeschler (2013b, 2018a): entailment, scope, and connectives.[3]

Entailment: This criterion is about the entailment relation from the corrective clause. Descriptive negation and metalinguistic negation behave differently: with descriptive negation (DN), COR entails NEG (515); with metalinguistic negation of scalar implicature (upward negation, MN1), COR entails POS (516); and finally, with presuppositional negation (MN2), COR entails the negation of both POS and its presupposition (517).

(515) a. *Abi is not beautiful, she is ugly*.
b. Abi is ugly → Abi is not beautiful

(516) a. *Abi is not beautiful, she is gorgeous*.
b. Abi is gorgeous → Abi is beautiful

3 In Moeschler (2018b), I have proposed a fourth criterion, *discourse relation*. This criterion will not be developed here, because it is mainly inferable from connectives.

(517) a. *Abi does not regret having failed; she passed.*
b. Abi passed → ¬ [Abi failed] ∧ ¬ [Abi regrets]

Scope: this criterion indicates what negation scopes over (the type of content that is the target of negation). In DN, negation scopes over POS, because it is this content that is evaluated as false. By saying *Abi is not beautiful*, the speaker assesses the proposition "Abi is beautiful" as false.

In MN1, it is the scalar implicature of POS (SI_{POS}) which is targeted by negation, not POS, explaining why entailment (516b) is consistent and why utterance (516a) is not contradictory (logically, Abi cannot be not-beautiful and gorgeous, but she can be beautiful – and even gorgeous). Figure 26 explains why.

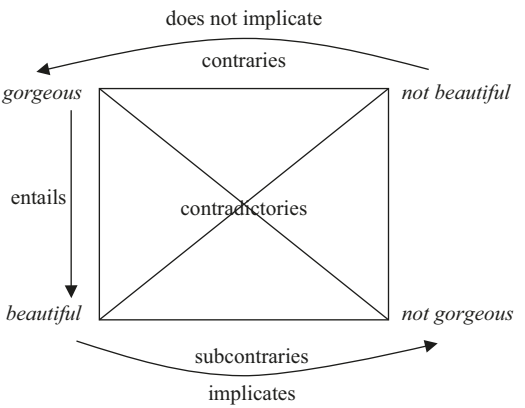

Figure 26: A logical square for positive scalar predicates.

Figure 26 shows that the upper bound predicate (*gorgeous*) is higher than the lower bound (*beautiful*): so, the first entails the second, and the second implicates the negation of the first, exactly as with quantifiers (*all* → *some, some* +> *not all*). Finally, what negation scopes over in MN2 is not POS but its implicature (SI_{POS}).

Connectives: The third criterion is the connective introducing COR. As (518) to (519) show, some connectives are possible with DN, MN1 and MN2, and some are excluded:

(518) a. *Abi is not beautiful, but ugly.*
b. *Abi is not beautiful; on the contrary, she is ugly.*
c. ? *Abi is not beautiful, because she is ugly.*

So, with DN (518a), *but* and *on the contrary* are fine, and *because* – as a justification of the negative assertion – is acceptable only if what is under consideration is the reason why Abi is not beautiful, or the reason why the speaker says *Abi is not beautiful*. However, the first use (explanation why) is somewhat lacking, because the given reason (COR, *Abi is ugly*) trivially entails "Abi is not beautiful"; what is expected is some independent property, like that *she wears very ugly clothing*. On the other hand, the justification of the assertion answers a question like *why do you say that?*, and is a higher-order justification. So, with DN, the most natural connectives are *but* and *on the contrary* (*mais* and *au contraire* in French).

With MN1 (519a), the connective is also *but*, but *because* can be used, exactly in the same sense of a justification for the speech act of assertion. However, *on the contrary* is not possible:

(519) a. *Abi is not beautiful, but gorgeous*.
b. ?? *Abi is not beautiful; on the contrary, she is gorgeous*.
b. *Abi is not beautiful, because she is ugly*.

The reason why (519b) is odd is because there is no contrary relation between *beautiful* and *gorgeous*. The contrary relation that *beautiful* displays is with *ugly*, its antonym, as Figure 27 demonstrates:

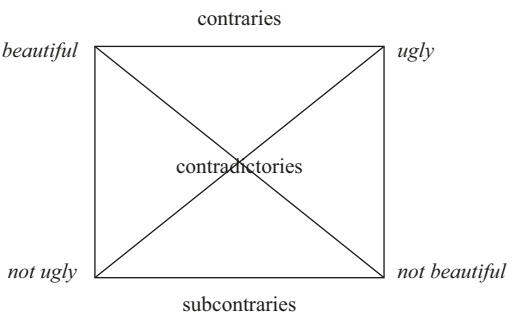

Figure 27: A logical square of antonyms.

In Figure 27, *beautiful* and *ugly* are contrary: Abi cannot be both beautiful and ugly. An exception to this would come from predicates applying to her different subparts (for instance, a person can be a beautiful young lady, but evaluated as ugly because of her clothing). In that case, (520) is not contradictory:

(520) *Abi is beautiful and ugly*.

Apart this very specific context of use, the contrary relations between antonyms have certain consequences: *beautiful* entails *not ugly*, just as *ugly* entails *not beautiful*. Moreover, the negation of one of the antonyms implicates the other, as shown in (521):

(521) a. *Abi is not ugly; I'd even call her beautiful.*
b. *Abi is not beautiful; I'd even call her ugly.*

Finally, the antonyms are subcontraries, since they can be both true, but not both false:

(522) a. *Abi is neither beautiful nor ugly; she is just ordinary.*
b. # *It is not the case that Abi is not beautiful and not ugly.*

The situation for the connectives licensed by MN2 (presuppositional negation) is much clearer, because only a justification connective (*because* or *since*) is possible:

(523) a. *Abi does not regret having failed, because she passed.*
b. * *Abi does not regret having failed, but she passed.*
c. * *Abi does not regret having failed; on the contrary, she passed.*

The explanation is one of discourse relations: *because* and *since* are connectives introducing an explanation or a justification relation, whereas *but* introduces a contrast and *on the contrary* a corrective relation (Moeschler 2013b, 2018a for a more detailed analysis). The question is why only an explanation or a justification is possible. Its answer depends on negation: when negation cancels a presupposition, what matters is the reason why the presupposition is cancelled. Surprisingly, the only possible corrective clause in that situation is the assertion of the denial of the presupposition; there is no possibility of using a stronger predicate, as there is in the case of MN1 (Moeschler 2018a). (524), if it is possible, simply contrasts both predicates *regret* and *be sorry*, and does not actually cancel the presupposition:

(524) a. *Abi does not regret having failed, she is sorry that she failed.*
b. presupposition: Abi failed

In other words, only the negation of the presupposition can defeat it: in doing so, the assertion is consequently defeated. So, COR must entail the negation of a presupposition. To test this prediction, the presupposition is cancelled in all the examples in (525):

(525) a. *I did not stop smoking, because I never smoked.*
presupposition cancelled: I used to smoke
b. *Mary does not know that Fred has been promoted, because he has not.*
presupposition cancelled: Fred has been promoted
c. *My daughter is not in Japan, because I have no daughter.*
presupposition cancelled: I have a daughter
d. *It wasn't John who went, because nobody went.*
presupposition cancelled: someone went
e. *What Oedipus does not want is not his mother, because he does not want anything.*
presupposition cancelled: Oedipus wants something

The reason that only connectives can introduce an explanation or a justification (*because* or *since*) is the metarepresentational aspect of MN2 and the need to cancel the presupposition explicitly. However, this property (the necessary explicitness of the negation of the presupposition) is not always required by metalinguistic usages of negation on the form: for instance, Carston (1996) gave such an example, as in (526). As far as MN1 is concerned (527), it is possible to imagine examples without COR:

(526) A: *We saw two mongeese at the zoo.*
B: *No, come on, you DIDN'T see two monGEESE.*

(527) A: *Your daughter is beautiful.*
B: *No, come on, you know that she isn't BEAUTIFUL.*

All three criteria (entailments, scopes and connectives) are shown in Table 52:

Table 52: 3 criteria for distinguishing DN from MN.

types of negation	entailments	scope	connectives
DN	COR → NEG	POS	*on the contrary, but*
MN1	COR → POS	SI_{POS}	*but, because*
MN2	COR → ¬POS ∧ ¬PP_{POS}	POS ∧ PP_{POS}	*because, since*

Entailments and scopes are semantic criteria, where connectives are a pragmatic criterion. The latter is certainly the most important criterion; being explicit, as it introduces COR, it allows the other criteria to be inferred. What is more interesting is that connectives have procedural meanings; connectives

introducing COR are not only criteria by which the function of negation can be disentangled (DN vs. MN1 or MN2), but also carry instructions on how to connect COR and NEG. This is the topic of next section.

5 Connectives as disentangling usages of negation and more

The fact that the only possible connectives for MN2 are *because* and *since* should be compatible with the description given in chapter 6, in which a crucial difference was made between three uses for *parce que* 'because': content, epistemic and speech act. In examples like (525), it would be nonsense to interpret the connective at the content layer, mainly because COR does not cause the negation of POS's presupposition. So, the question is whether there is an epistemic or a speech act use of the causal connective when it introduces the negation of a presupposition. The most appropriate answer is the *speech act* analysis, because what the speaker does is give a reason that he cannot use the assertion, his reason being the falsehood of the presupposition. So, all these examples show a constraint on the uses of such assertions. If this analysis is correct, there should be other speech acts that might imply that their presupposition is false. This is exactly what happens with questions, as in (528):

(528) a. *Did I did stop smoking? Because I never smoked.*
presupposition cancelled: I used to smoke
b. *Does Mary know that Fred has been promoted? Because he has not.*
presupposition cancelled: Fred has been promoted
c. *Is my daughter in Japan? Because I have no daughter.*
presupposition cancelled: I have a daughter
d. *Was it John who went? Because nobody went.*
presupposition cancelled: someone went
e. *What does Oedipus want? Because he does not want anything.*
presupposition cancelled: Oedipus wants something

How can the causal connective introducing COR after MN2 be compatible with the speech act analysis of causal connectives given in chapter 6? Recall this analysis:

(529) *A complete analysis of parce que in the speech act domain*
P? Parce que Q
a. conceptual meaning
1. Entailments *P, Q*
2. Explicature *X*CAUSE*Y*
b. procedural meaning *Q* CAUSE asking whether *P*

According to this analysis, *Q* CAUSE asking whether *P*. In the case of an assertion, the metalinguistic negation interpretation of NEG "I object to the idea that *P*" is caused by the negation of the presupposition of *P*. Consequently, (530a) is interpreted as (530b):

(530) a. *Did I stop smoking? Because I never smoked.*
b. I never smoked CAUSE I asked whether I stopped smoking

With MN2, the idea is that the corrective clause is itself the cause for the use of metalinguistic negation:

(531) a. *Abi does not regret having failed, because she passed.*
b. Abi passed CAUSE the speaker object to the idea that Abi regrets having failed

As for DN and MN1, where there is the use of a contrastive connective like *but* (*mais* in French), it must be established what contribution the connective *but* makes to the descriptive vs. metalinguistic interpretation of negation. When an addressee has to process NEG + *but*, as in (532), is the interpretation as in (533) or (534)?

(532) Abi is not beautiful but. . .

(533) It is not the case that Abi is beautiful. . .

(534) I object to the idea that Abi is beautiful. . .

One way to answer this is to look at the possible follow-up after *but*. If negation is descriptive, what is expected is a set of possible contraries or antonyms like *ugly* or *ordinary* (predicates meaning less than beautiful); if negation is metalinguistic, what is expected is an upper-bound predicate, meaning more than beautiful.

The relevant question is then how the same connective can be compatible with two different scales, one negative and one positive. One answer is that the connective is not the same, as argued of French *mais*, which has been identified as two connectives; Anscombre, Jean-Claude and Ducrot (1977) call these *mais SN* (for German *sondern* and Spanish *sino*) and *mais PA*, for the Spanish *pero* and the German *aber*. *SN* is typically an operator, and – as I will show – is only compatible with DN; by contrast, with MN1, *mais* corresponds to *PA* (an argumentative connective introducing a contrast relation). However, Horn (1989) gives the opposite analysis, speculating that *SN* is compatible with metalinguistic

negation, and *PA* only with descriptive negation. This is based on a distributional property of *mais*: in a typical use of *SN*, which always follows a negation, the corrective clause cannot be a complete sentence. With *PA*, however, the corrective clause can be a full corrective clause:

(535) a. *Max n'* *est* *pas* *grand* *mais$_{PA}$* *petit*.
Max NEG is NEG tall But small
'Max is not tall but short.'
b. *Max n'* *est* *pas* *grand* *mais$_{PA}$* *il est petit*.
Max NEG is NEG tall But he is small
'Max is not tall but he is short.'

(536) a. *Max n'* *est pas* *grand* *mais$_{SN}$* *très grand*.
Max NEG is NEG tall but very tall
'Max is not tall but very tall.'
b. ?? *Max n'* *est pas* *grand* *mais$_{SN}$* *il est très grand*.
Max NEG is NEG tall but he is very tall
'Max is not tall but he is very tall.'

This analysis is based on a non-demonstrated assumption by Anscombre and Ducrot (1977: 32): "We have grounded our description of *PA* on the assumption that when it follows a negation, it can only be a descriptive negation, and not a polemic one".[4]

What could the function of the connective be after DN or MN1? After a descriptive negation, *mais* cannot be but corrective. What COR introduces is an alternative description; in (535), for instance, the speaker opposes two descriptions of Max within a single speech act.

(537) CORRECTION [¬[Max is tall], Max is small]

A distributional argument can be given here: *SN* is compatible with *au contraire* 'on the contrary', unlike *PA*, which can be expanded by *pourtant* 'however'. This test, given by Anscombre and Ducrot, clearly shows that descriptive negation licenses *SN*:

4 "Nous avons [...] fondé notre description de PA sur l'hypothèse que, lorsqu'il suit une négation, il ne peut s'agir que d'une négation descriptive, et non pas polémique". *Polemic* stands here for 'metalinguistic'.

(538) *Il n'* *est* *pas français,* *mais$_{SN}$* *au contraire* *il est allemand.*
he NEG is NEG French but on the contrary he is German
'He is not French, but in fact he is German'.

(539) *Il* *n'* *est* *pas français,* *mais$_{PA}$* *pourtant il parle* *très bien* *français.*
he NEG is NEG French but however he speaks very well French
'He is not French, but he still speaks French very well.'

Applying this criterion to the issue of the type of negation, *en revanche/pourtant* 'rather/however' follows *PA*, and *au contraire* 'on the contrary' is associated with *SN:*

(540) a. *Abi n'est pas belle, mais$_{SN}$ au contraire quelconque.*
'Abi is not beautiful, but in fact ordinary.'
b. *# Abi n'est pas belle, mais$_{SN}$ {en revanche, pourtant} quelconque.*
'Abi is not beautiful, but however ordinary.'

(541) a. *# Abi n'est pas belle, mais$_{PA}$ au contraire extraordinaire.*
'Abi is not beautiful, but in fact gorgeous.'
b. *Abi n'est pas belle, mais$_{PA}$ {en revanche, pourtant} extraordinaire.*
'Abi is not beautiful, but however gorgeous.'

In brief, it seems that the *mais*-test is significant, but not in the sense predicted by Horn and Anscombre-Ducrot. So how can MN1 license *PA*?

The argument is the following. As proposed above, a correction is a single speech act. This is predicted by Anscombre and Ducrot (1977: 40), who argue that *SN* must obligatorily follow the lexically complex negation *non pas* 'not' – thus, *non pas* must be followed by COR:

(542) *Pierre viendra* *non pas demain,* **(mais après demain).*
Pierre come-FUT NEG NEG tomorrow but after tomorrow
'Pierre is not coming tomorrow, but after tomorrow.'

As they point out (Anscombre and Ducrot 1977: 40),

> It is therefore not surprising that [the correction] is introduced by *mais* = *SN*, if we admit that the utterance *p SN q* is the object of one unique act of enunciation. If *mais* = *PA* is on

> the other hand impossible in these conditions, it is because it would force the intervention of a succession of two acts of enunciation (which is blocked by *non*).[5]

The interesting point is that we have a predictive test: if *non pas + Adj* is followed by a lower-bound adjective, then DN licenses *SN*, whereas if *non pas + Adj* cannot be followed by an upper-bound adjective, then it confirms that DN licenses *SN*. So, does the test result in MN1 licensing *PA* or *SN*? The result is straightforward: *non pas* is incompatible with an upper-bound predicate, as (543) and (544) show, but compatible with a lower-bound predicate; thus, DN licenses *SN* and MN *PA*.

(543) *Abi est non pas belle, mais laide.*
Ani is NEG NEG beautiful but ugly
'Abi is not beautiful, but ugly.'

(544) # *Abi est non pas belle, mais extraordinaire.*
Abi is NEG NEG beautiful but gorgeous
'Abi is not beautiful, but extraordinary.'

The final question is how to explain the compatibility of MN1 and *PA*, the answer to which lies in the semantics of *PA*. Here is the classic description of *PA*, which corresponds to the argumentative *mais* (Anscombre and Ducrot 1977: 28):

> Let *p* and *q* two sentences: uttering *p PA q* is
> (1) Presenting *p* as a possible argument for a possible conclusion *r*.
> (2) Presenting *q* as an argument against that conclusion, i.e. [. . .] as an argument for ¬*r*.
> (3) Attributing to *q* more argumentative strength in favour of ¬*r* than in favour of *r*. The sequence *p PA q*, as a whole, is thus argumentatively oriented in favour of ¬*r*.[6]

5 "Rien d'étonnant donc à ce qu'elle [la rectification] soit introduite par *mais* = *SN*, si on admet que l'énoncé *p SN q* fait l'objet d'un acte d'énonciation unique. Si un *mais* = *PA* est en revanche impossible dans ces conditions, c'est parce qu'il ferait intervenir une succession de deux actes d'énonciation (ce qui est empêché par *non*)."

6 "Soient *p* et *q* deux phrases; énoncer *p PA q*, c'est
(1) Présenter *p* comme un argument possible pour une éventuelle conclusion *r*.
(2) Présenter *q* comme un argument contre cette conclusion, i.e. [. . .] comme un argument pour ¬*r*.
(3) Attribuer à *q* plus de force argumentative en faveur de ¬*r* que l'on en attribue *p* en faveur de *r*. La suite *p PA q*, prise dans sa totalité, est donc argumentativement orientée en faveur de ¬*r*".

The question is whether *Abi n'est pas belle, mais extraordinaire* 'Abi is not beautiful but gorgeous' supports such an analysis. Is NEG an argument for a conclusion *r* and COR an argument for the opposite conclusion ¬*r*? Suppose the following values for the proposition's variables: NEG corresponds to *p* (*Abi n'est pas belle*), which is opposed to *p'* (*Abi est belle*), which is to say POS. Negation, in its MN1 meaning, scopes over the implicature of *p'* (that is, *Abi is not gorgeous*), which is contradictory to COR. So, what could the argumentative content of *p* be? Imagine that the question under discussion is whether Abi can play Juliet. By saying *p*, the speaker is arguing against the conclusion that Abi can play Juliet. If *r* is "Abi cannot play Juliet", *PA* is predicted to introduce an argument against this conclusion: ¬*r*, that "Abi can play Juliet". This is exactly what *Abi est extraordinaire* 'Abi is gorgeous' is supposed to do, which is to say *q*.

MN1 is therefore compatible with *PA* in its argumentative meaning (see Moeschler 2018b for a development). Can it then be said that, in this use, it is not one but two speech acts which are realized? Returning to the classic speech act analysis of metalinguistic negation by Horn (1985), there is a clear distinction between two speech acts: (i) the objection, followed by (ii) a justification (*parce que* corrective clause) or a contrastive corrective clause (the *PA* corrective clause). From the perspective of the linguistic argumentation theory (Anscombre and Ducrot 1983), which is based on speech acts, a discourse like *P PA Q* realizes two speech acts: the first, an act of argumentation from *P* to *r*; the second, from *Q* to ¬*r*. So, there is not just a semantic difference between *SN* and *PA* (only *PA* is a connective), but also a pragmatic difference: one single speech act with *SN*, two speech acts with *PA*. This is a supplementary argument justifying why COR is necessary, or at least required to disambiguate the scope of negation: if COR is required, it is because it cannot be inferred semantically from NEG, as is the case in the ordinary use of DN. The different structures of the three usages of negation can thus be represented as in (545):

(545) a. DN: CORRECTION [*not-P*, *Q*]
b. MN1: ASSERTION/QUESTION [*not-P*] ∧ CONTRAST [*Q*]
c. MN2: ASSERTION [*not-P*] ∧ EXPLANATION [*Q*]

6 Is negation truth-conditional by default?

At the beginning of this chapter were presented different approaches focused on different types of negation. I argued for a monoguist approach to negation, following the methodological recommendation by Grice (1978), and also the conclusion by Horn (1985), where negation is semantically univocal but pragmatically

ambiguous between descriptive and metalinguistic negation. However, my analysis has led to the distinction between three uses of negation, one descriptive and two metalinguistic. Three criteria were proposed to disentangle the meaning of negation: entailment, scope and connectives. The question is then whether negation is ambiguous or not – in particular, is it semantically or pragmatically ambiguous? The possible answers depend on the following algorithms.

(i) If negation is *semantically ambiguous*, then its default meaning is descriptive (Burton-Roberts 1989). This approach supposes a two-step process: first, descriptive negation is tested; if the follow-up COR cancels one component of POS (implicature or presupposition) because of contradiction, then negation is interpreted as metalinguistic rather than descriptive.

(ii) If negation is *pragmatically ambiguous*, as Horn predicts, what makes the difference is the contribution of the context. But in this situation, too, the contextual contribution is predicted to be more relevant in the context of metalinguistic negation, so the result is not really different: default semantics is truth-conditional and enriched pragmatics is metalinguistic.

(iii) The third possibility, advocated in Carston (2002), is that negation is *neither semantically nor pragmatically ambiguous*, because its meaning (descriptive vs. metalinguistic) is the result of a contextualisation.

These three strategies, corresponding to the three possible answers (semantic ambiguity, pragmatic ambiguity, and contextual approach), are considered in more detail below:

(i) *Semantic ambiguity*. This position gives two meanings to negation (internal vs. external negation). It is systematically used in the formal approach to negation (Karttunen and Peters 1979, Gazdar 1979). In Karttunen and Peters (1979: 47), a crucial difference is made between two types of negation: ordinary negation and contradiction negation, as illustrated in (546).[7]

> We think that contradiction negation differs semantically from ordinary negation only by virtue of having a broader target. As we see it, ordinary negation pertains just to the proposition expressed by the corresponding affirmative sentence [Φ^e]; it does not affect conventional implicatures [Φ^i]. Contradiction negation, on the other hand, pertains to the total meaning of its target sentence, ignoring the distinction between truth conditions and conventional implicatures.

7 In Karttunen and Peters (1979: 46), these examples are illustrations of the cancellation of a conventional implicature (as opposed to a presupposition). Presuppositions are reinterpreted under the general category of conventional implicature.

(546) a. ordinary negation of Φ: $<\neg\Phi^{e}; \Phi^{i}>$
b. contradiction negation of Φ: $<\neg[\Phi^{e} \wedge \Phi^{i}]; [\Phi^{i} \vee \neg\Phi^{i}]>$

A second type of approach, in the same vein, is that of Gazdar (1979), who also maintains a semantic distinction between ordinary negation (internal negation) and external negation. External negation is equated with verbs of saying – that is, to *plugs*, which "block presuppositions" (Gazdar 1979: 109). Internal negation belongs to the other type of "complementizable" verbs: *holes*, which "make all the presuppositions of the complement into presuppositions of the matrix" (Gazdar 1979: 109). However, the process of metalinguistic (external) interpretation is made more explicit by the concept of *potential* inference (implicature and presupposition) and the hierarchy of inference (Levinson 1983: 213), repeated here in (547):

(547) 1. the entailments of the uttered sentence *S*
2. the clausal conversational implicatures of *S*
3. the scalar conversational implicatures of S
4. the presuppositions of *S*

Vitally, entailments win over implicatures and presuppositions. So, how can metalinguistic negation (external negation) be explained in cases of implicature and presupposition cancellation, as in (548) and (549)?

(548) *The king of France is not bald, because there is no king of France.*

(549) *Some of the students, in fact all, came to the party.*

Gazdar's explanation introduces the notion of *potential presupposition* and *implicature*. Potential implicatures "give all the implicatures which the sentence could possibly have prior to contextual cancellation" (Gazdar 1979: 55). "A presupposition is a POTENTIAL presupposition. [. . .] They are what the presuppositions would be if there was no "projection problem", no "ambiguity" in negative sentences, and no context-sensitivity" (Gazdar 1979: 124). In other words, "potential presuppositions [are] something given to us by the lexicon and the syntax" (Gazdar 1979: 124). The first step of the process of presupposition and implicature cancellation is to trigger the potential inference; the second step is its cancellation, because the entailments of the corrective clause cancel the potential presupposition or implicature.

(550) *The king of France is not bald, because there is no king of France*.

a. Potential presupposition: there is a king of France
b. Cancellation of the potential presupposition: there is no king of France

(551) *Some of the students, in fact all, came to the party*.

a. Potential scalar implicature: not all of the students came to the party
b. Cancellation of the potential scalar implicature: all of the students came to the party

In this case, it is predicted that metalinguistic negation – scoping either over a scalar implicature or a presupposition – should be more costly than descriptive negation, since it is a two-step process. However, Blochowiak and Grisot (2018) provide experimental arguments showing no significant difference in the reading time for the negative utterance in either descriptive or metalinguistic context, nor for the corrective clause, with the same results holding regardless of whether a context (in the form of a picture) is provided. This initial result confirms that the semantic ambiguity approach is highly improbable from a cognitive point of view.

(ii) *Pragmatic ambiguity*. In the case of the pragmatic ambiguity, following Carston (1996; 2002), such a Gricean perspective attributes a default wide scope to negation, and obtains the narrow scope by a pragmatic process, shown for an utterance like (552) in (553):

(552) The king of France is not bald.

(553) a. semantics: not [the K is B]
b. pragmatics: the K is not-B

This process is obtained by a general *narrowing* process in Relevance Theory. According to a standard Gricean interpretation, reference to conversational maxims are made (Carston 1996; Moeschler 2013c: 191). First, the wide scope reading is not informative enough, and the audience must choose between two entailments: either "there is a king of France" or "the king of France is bald". By choosing the first entailment, negation must then target the second. So, the maxims of manner "be brief" and "avoid obscurities" are responsible for the internal negation (narrow scope): the speaker choose the shortest utterance (he is not saying *The king of France is not bald and there is a king of France*);

second, the hearer is authorized to infer that the speaker has not uttered an ambiguous utterance.

This leads to an unhappy consequence for the pragmatic ambiguity approach. If this approach predicts that wide scope is the default analysis, how can it be explained that, without any corrective clauses, descriptive negation is automatically obtained? Worse yet, how can humorous usages of negation be explained? If negation were by default wide scope, the following humorous observation by the French humourist Pierre Desproges, Pierre (https://www.youtube.com/watch?v=eRUjpF9uUcg, accessed 31 May 2019) would not be possible:

(554) *Marguerite Duras n' a pas seulement écrit que des conneries.*
Marguerite Duras neg has neg only written only some bullshit
Elle en a aussi filmées.
she pro has also fimed
'Marguerite Duras has not just written bullshit. She has filmed some, too.'

There would be no humorous effect, because negation would be wide scope by default, giving rise to the narrow scope reading in the second step of the process, as in (555):

(555) It is not the case that M.D. has just written bullshit +> it is the case that M.D. has not just written bullshit

However, the narrow scope interpretation is expected to be the case, because the humorous effect is exactly the reverse of that in (555), as in (556):

(556) It is the case that M.D. has not just written bullshit +> it is not the case that M.D has just written bullshit

(iii) The *contextual approach*, advocated here, is monoguist and implies that pragmatic meaning is contextually obtained. By contrast, the truth-conditional semantics of negation is not default: the consequence is that both descriptive and metalinguistic usages of negation are derived contextually. COR entailments, scopes and connectives are linguistic indices, which, combined with contextual information, trigger the intended meaning. Consequently, metalinguistic uses are no longer predicted to be more costly than descriptive uses.

The only question is how the correct interpretation is obtained. The advantages of the semantic and the pragmatic ambiguity approaches is that there is a default case, which is either confirmed or enriched contextually; in the contextual

approach, there is no default. So how can it work? The simplest case is that of descriptive negation; the fact that it is accessible from (557) requires explanation.

(557) *Abi is not beautiful.*

There is no possible semantic entailment from *not-beautiful* to any predicate. As Figure 27 shows, the only possible relation is one of implicature, from *not-beautiful* to *ugly*, which corresponds to the MaxContrary effect (Horn 1989): a contradictory negation is a weaker form than its antonyms. So, *not-beautiful* I-implicates *ugly*, an implicature which can be made explicit, as in (558); and, as argued in chapter 1, an implicature can be made explicit with neither redundancy nor contradiction.

(558) *Abi is not beautiful, but ugly.*

What about MN1, as in (559)?

(559) *Abi is not beautiful, but gorgeous.*

The contextual approach needs support for the wide scope reading (the reading which cancels the implicature "Abi is not more than beautiful"); the context must support the fact that Abi is beautiful or more than beautiful. This is exactly what happens when the context fits the speaker's intention. In this case, a wide scope reading for negation is confirmed by the corrective clause *but gorgeous*, which entails "Abi is beautiful". So, in this case, no reinterpretation is needed, and only one process is required.

Finally, the MN2 reading supposes a situation where there are certain cues working against the linguistically encoded presupposition, cues not only given by the previous utterance, but also by tone or intonation. Suppose that MN2 reacts to a previous utterance such as the question in (560):

(560) A: *Is your daughter in Japan?*
B: *No, my daughter is not in Japan, because I have no daughter.*

In (560), B gives a cue to her audience: the complete negative clause contrasts with the elliptical answer *No, I have no daughter*. In this case, there is no cue which would allow us to infer from *No* that the presupposition of the question

is false.[8] But even if the audience cannot anticipate that there is something wrong with the question under discussion, the utterance is an echo of the question. What is interesting with an echoic utterance is that it is not implying the speaker's commitment. This is the case with irony (561), and with indirect (562a) or direct (562b) echoic utterances, because such echoic utterances lack the usual sense and reference properties:

(561) In a sudden downpour: *What nice weather for a picnic!*

(562) Patient: *I have a toothache.*
Dentist: a. *You have a toothache. Open your mouth.*
b. *I have a toothache. Open your mouth.*

The condition for direct access to MN2 is therefore the audience's ability to recognize the echoic nature of the negative utterance. What is pragmatically efficient with this property is that the effect of the corrective clause COR is to cancel the presupposition retrospectively, meaning that COR confirms the cancellation of the presupposition, as well as of the scalar implicature in (559). Here again, we claim that there is *no default descriptive interpretation* of the negative utterance, nor accommodation by the cancellation of the implicature or the presupposition.

7 Conclusion: is negation conceptual or procedural?

The challenge of this chapter was to give a univocal semantic description of negation, which can explain its multiple functional meanings. I have defended a truth-conditional semantic analysis of negation, with contextual enrichments, giving rise to both descriptive and metalinguistic meanings; I also provided criteria to disentangle the main three usages of negation. The final point to discuss is the nature of negation: is its meaning conceptual or procedural? This question is relevant because it challenges the division of labour between functional and lexical categories. Syntactically, negation is the maximal projection (*NegP*) of the functional category *Neg*; the classic version of the conceptual/procedural meaning opposition predicts that negation encodes a procedural meaning. However, this chapter has defended a truth-conditional semantics, leaving inferential meaning to pragmatics. These two properties hint at a mixed

8 In effect, an elliptical *No* answer cannot cancel a presupposition like "I have a daughter".

Table 53: Types of meaning, type of categories.

		lexical	functional
procedural	truth-conditional	×	✓ pronouns ✓ indexicals ✓ *negation*
	non-truth-conditional	✓ content lexicon	✓ connectives ✓ tenses
conceptual	truth-conditional	✓ content lexicon	✓ connectives ✓ tenses ✓ *negation*
	non-truth-conditional	✓ illocutionary adverbials	×

conceptual/procedural meaning, allowing Table 2 (Chapter 2) to be completed as follows (Table 53).

So, negation is both conceptual and procedural as well as truth-conditional. The *conceptual* and truth-conditional meaning is responsible for the truth-conditional effects, both for descriptive and metalinguistic meaning. The *procedural meaning of negation* now targets the *scope of negation*: POS, SI_{POS}, and PP_{POS}; negation encodes the possible targets (proposition, implicature or presupposition). This makes sense of the distinction between conceptual and procedural meaning, exactly as in the case of connectives, where procedural meaning was restricted to the direction of causal meaning. As such, procedural meaning is an instruction helping comprehension: conceptual meaning encodes the assignation of a truth-value to the negator's argument, whereas procedural meaning targets the scope of negation. This combination makes the perfect prediction: whatever the target, the content under negation is evaluated as false. This also makes sense of the uniformity of the syntactic device for negation. As predicted by Horn (1985), there is no special linguistic device for expressing metalinguistic negation (see Zuo 2017 for an interesting discussion on metalinguistic negation in Mandarin Chinese), as procedural meaning provides the correct instructions targeting the appropriate scope of negation.

Conclusion: How much is meaning conventional?

1 Introduction

This book is about non-lexical pragmatics: the meaning encoded by functional categories like tenses (chapter 4), causal connectives (chapter 6) and logical words (chapters 7 and 8). The focus has primarily been on types of meaning (chapter 1) and conceptual and procedural meaning (chapter 2). I addressed general issues like the representation of time in natural language (chapter 3) and the relation between language and causality (chapter 5).

In the course of writing this book, I spent a great deal of time considering the type of meaning encoded by functional categories. Combining rich semantics and a theory of pragmatic inference is not just a challenge at the descriptive level, but also imposes certain general theoretical assumptions on the semantics-pragmatics interface. The general conclusions can be summarized as follows:

1. All the categories investigated (tenses, connectives and negation) have both a conceptual and a procedural meaning. These two types of meaning are linguistically encoded, and thus part of the semantics of natural language.
2. All the categories investigated contribute to truth-conditional as well as non-truth-conditional meaning (that is, to explicatures and implicatures).
3. All the categories investigated have rich semantics, by which I mean a semantics that refers to a non-trivial inference process and to a substantial conceptual meaning.
4. All the categories investigated are context-sensitive. This is a central property, focusing on the crucial role of pragmatic process in utterance comprehension, whatever the rich or powerful semantic contribution of the clausal compositional meaning.

It is not the pragmatics of functional categories which is critical here so much as their semantics. In this chapter, I would like to address as clearly as possible the relation between *convention* and *meaning* (see Moeschler 2018e for an initial discussion).

2 Convention in meaning

One of the key concepts in establishing possible semantic content is *convention*. However, the concept of convention mainly has the function of explaining how it is possible that speakers of the same language, like French, use the same

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words with the same meanings. As discussed in lexical pragmatics within the Relevance Theory framework, the meanings of substantive or content words like nouns, verbs and adjectives are pragmatically modulated into what have been called *ad hoc concepts* (Wilson 2003; Wilson and Carston 2007). A linguistically encoded concept, when used, thus becomes a pragmatically inferred concept (*ad hoc* concept); when modulated, this gives rise to a narrowing or a broadening process, or, with metaphors, an extreme broadening. As it stands, one of the positive outcomes of this account of pragmatic modulation in word meaning is to escape *polysemy*, which is traditionally described as a semantic property of multiple, often related, meanings thanks to usages, conventions, pragmatic incorporated processes (like metonymy), and so on. In a recent paper, Carston (2018) defends a radical pragmatic view of polysemy, supported by the following facts.

The first argument is the difference between the acquisition of syntax and the learning of content words by children. This a well-known topic (Bloom 2000; Reboul 2007); but even though words are acquired in pragmatic settings with specific conditions (such as shared attention, pointing and so forth), a pragmatic approach to polysemy does not explain how a child can acquire a fixed meaning content for words. There is a very famous example on how a child, Ari, between 16 and 21 months old, initially had a multifunctional concept MIXER, corresponding to a real mixer, a hand pump and a sewing machine (Reboul 2007; Marvis 1987); what then happened was the specification of the concept MIXER to only one type of item (the leftmost of the three).

The second argument is Homesign. As Carston notices, "deaf children who are not exposed to a conventional sign language (so get essentially no linguistic input), nevertheless, develop a marge set of words and idioms, consisting of discrete gestures paired with concepts/senses" (Carston 2018: 11). This a fascinating and uncontroversial issue, but is it a sufficient argument for the thesis of pragmatic polysemy?

This leads Carston to makes a clear difference between C-lexicon (communicative lexicon) and L-lexicon (linguistic lexicon). The C-lexicon is "a set of reasonably stable associations of particular formal elements (syntactically categorised phonetic/gestural objects) and senses/concepts, tacitly agreed on across a community of speakers (i.e. a set of conventions) and used by them as devices of communication" (Carston 2018: 9). For its part, the L-lexicon "is a component of the computational I-language system, [. . .] whose listed elements are the basic input of the system of combinatorial principles that generate the formal structures of the language" (Carston 2018: 9). Manifestly, the main argument for distinguishing C- from L-lexicon is *convention*. The C-lexicon, aside from what is supposed to happen with pragmatic modulation, is somehow the classic

definition of what Saussure calls *langue*, the social convention made of a system of linguistic signs shared by the members of a community: "[language [*langue*]] is both a social product of the faculty of speech and a collection of necessary conventions that have been adopted by a social body to permit individuals to exercise that faculty" (Saussure 1977: 9).[1] On the other hand, the L-lexicon is part of the I-language, which is defined not as a social code but as an individual faculty. So, the distinction between the two types of lexicon seems to correspond to the classic division of labour between the competence system and the performance system. In the Chomskyan tradition, the relation between I-language (internal language) and E-language (external language) intervenes at the level of interfaces – the sensori-motor and the conceptual intentional interfaces – as "each linguistic expression (...) generated by I-language includes instructions for the performance systems in which I-language is embedded" (Chomsky 2000: 27). If this view of lexicon is correct, then the relation between L-lexicon and C-lexicon occurs at the interfaces (Chomsky 2000: 28):

> The performance systems appear to fall into two general types: articulatory–perceptual, and conceptual–intentional. If so, it is reasonable to suppose that a generated expression includes two *interface levels*, one providing information and instructions for the articulatory-perceptual systems, the other for the conceptual-intentional systems. One interface is generally assumed to be phonetic representation (Phonetic Form, PF). The nature of the other is more controversial; call it LF ("Logical Form").

So, from a Chomskyan perspective, there is no issue in distinguishing between the two types of lexicon. However, further assumptions must be made in order to make sense of the two: "For many philosophers, language is a social competence and any particular language consists of a set of shared conventions, which includes the established senses of words as well as various sociocultural norms of language use (e.g. how to make a polite request)" (Carston 2018: 9, referring to Lepore and Stone 2015). As such, a logical consequence is the acknowledgement that "the exigencies of human communication make it virtually inevitable that a word will become polysemous" (Carston 2018: 3). I find this last claim controversial because it gives little weight to social conventions and does not make sense of I-language: if I-language is an individual competence, how can we explain that meaning is shared and does not gives rise to infinite variation? It seems that we must posit something that goes beyond convention in meaning, which is C-lexicon.

1 "[la langue] est à la fois un produit social de la faculté du langage et un ensemble de conventions nécessaires, adoptées par le corps social pour permettre l'exercice de cette faculté chez les individus" (Saussure [1916] 1978: 25).

A final argument against the idea that there are two types of lexicon is the nature of variation in lexical meaning. Surprisingly, even though lexicon is acquired individually by a single and original process, people converge in the way meaning is represented in the substantive lexicon. What varies is the context in which the lexical expressions are used, and the intentions of the speakers; thus, there is no confusion in reference, as far as nouns, verbs or adjectives are concerned. Let me illustrate this property with a short children's story by a Swiss German writer, Peter Bichsel, Peter *Ein Tisch ist ein Tisch* 'A table is a table'. An old man is annoyed with the rooms in which he lives and the objects inside them and wants a change. Here is how he proceeds:

> 'Always the same table,' said the man, 'the same chairs, the bed, the picture. And I call the table a table, I call the picture a picture, the bed is named bed, and people refer to the chair as a chair. But why, really? The French call the bed "lee", the table "tahbleh", they name the picture "tahblo" and the chair "shez", and they understand one another. And the Chinese understand one another too.
>
> 'Why isn't the bed called picture,' thought the man and smiled, then he laughed, laughed until the neighbours knocked on the wall and shouted 'Quiet!'
>
> 'Now it's changing,' he shouted and from now on called the bed 'picture'.
>
> 'I'm tired, I'll go to picture,' he would say, and in the mornings he would often remain lying in picture for a long time and reflect on what he would now call the chair, and he named the chair 'alarm clock'.
>
> So he got out of bed, dressed himself, sat down on the alarm clock, and rested his arms on the table. But the table was no longer called table, it was now called rug.
>
> So in the morning the man would leave his picture, get dressed, sit down at the rug on the alarm clock and reflect on which things he could now call by what names.
>
> The bed he called picture.
>
> The table he called rug.
>
> The chair he called clock.
>
> The newspaper he called bed.
>
> The mirror he called chair.
>
> The clock he called photo album.
>
> The cupboard he called newspaper.
>
> The rug he called cupboard.
>
> The picture he called table.
>
> And the photo album he called mirror.
>
> [. . .]
>
> The old man bought himself some blue school notebooks and wrote them full of the new words, and this kept him very busy, and he was now only rarely seen on the street.
>
> Then he learned the new terms for all things, and as he did so he forgot more and more the right ones. He had a new language that belonged only to him.
>
> From time to time he would dream in the new language, and then he translated the songs from his schooldays into his language, and he sang them softly to himself.

> But soon translating was also hard for him, he had almost forgotten his old language, and he had to search for the right words in his blue notebooks. And talking to people made him anxious. He had to think for a long time what people call things.
>
> [. . .]
>
> The old man in the grey coat could no longer understand people, that wasn't so bad.
>
> Much worse was that they could no longer understand him.
>
> And therefore he said nothing more.
>
> He was silent, spoke only to himself, did not even greet them.
>
> (translation by Lydia Davies, http://www.thewhitereview.org/fiction/a-table-is-a-table/, accessed 31 May 2019)

This *a contrario* argument shows that convention allows communication. Without convention, there is no shared language and no communication. But here we face the real difficulty at the heart of this book: meaning is not just an issue of convention, but also an issue of inferring speaker meaning. So, what is required to ensure communication is that the addressee follow the appropriate path to arrive at the speaker's intended meaning. This path is not a broad highway so much as a narrow and little-known track, signalled by cues of variable precision which belong not to the content lexicon but to the functional lexicon. So, the prediction is that, the more the path is signposted, the easier it will be followed, and the quicker it will be to access the target, the speaker's intended meaning. All the phenomena analysed in this book have this very function: not only does their procedural meaning ensure such a smoothing of the path, they also indicate the nature of the path (small or large, simple or complex) with their conceptual meaning. Combining both their conceptual and procedural meanings, they show how specific the road on the map is.

3 Convention, conceptual and procedural meaning

Consider the issue of convention from a more technical perspective, using the conceptual/procedural distinction. To what extent can we say that conceptual meaning is conventional? As described in chapter 2, a concept has as a lexical entry a word (that is, an expression of a natural language), so the function of the lexical entry of a concept is justified by its public counterpart in natural language. On the other hand, the procedural meaning of a lexical item corresponds to the set of instructions necessary for the comprehension of the utterance. As such, where conceptual meaning is conventional as far as the relation between the concept and its lexical entry is concerned, certain minimal information must also be encoded: the logical entry, responsible for the semantic entailment of the sentence. In terms of procedural meaning, it is more difficult to talk

about *convention*: what is conventional is the conceptual meaning of the functional item. For instance, when it comes to tenses, concepts like PAST, PRESENT or FUTURE are conventional, but it is difficult to talk about a *convention of language* explaining temporal order. At best, procedural meaning is a *convention of use*, by analogy with the distinction explaining how non-literal becomes more or less conventional (MorganJerry L. 1978).

For the relation between the semantics and pragmatics of the functional lexicon (tenses, connectives and negation), this implies that a conceptual semantics must be robust and non-flexible. Pragmatic meaning, however, can be more flexible, mainly because it is encoded in procedural meaning. So, one of the boldest claims of this book is that procedural meaning is not just the locus of variation but also the locus of change in meaning.

Take a very well-known example, the French negative marker *pas*. The word *pas* is a noun in its origin, meaning "footstep"; literally, the sentence *je ne marche pas* 'I do not walk' means "I do not make a single small quantity of distance which is measured as a footstep". From a noun, *pas* progressively became an adverbial in a position following the conjugated verb. The passage from the negative marker *ne* to *pas* is well-known, long ago observed by the French linguist Antoine Meillet, Antoine (1912: 140–141):

> Languages follow a kind of spiral development: they add accessory words to obtain intense expression; these words weaken, degrade and fall to the level of simple grammatical tools; we add new words or different words to express ourselves; the weakening starts again, and this goes on indefinitely. (translation is mine)[2]

This process is given the label of Jespersen's Cycle (Jespersen 1917; van der Auwera, Vosse, and Devos 2013). From the point of view of the history of French, five stages in the formation of negation have been observed (Moosegard Hansen 2018): *ne* > *ne* (*pas*) > *ne pas* > (*ne*) *pas* > *pas*, as seen in the series *je ne dis* > *je ne dis (pas)* > *je ne dis pas* > *je (ne) dis pas* > *je dis pas*.[3] So, where the meaning of negation moves from *ne* to *pas*, it is because the negation clitic weakens to the point of disappearing. If Jespersen's Cycle is a correct hypothesis, then this

2 "Les langues suivent ainsi une sorte de développement en spirale: elles ajoutent des mots accessoires pour obtenir une expression intense; ces mots s'affaiblissent, se dégradent et tombent au niveau de simples outils grammaticaux; on ajoute de nouveaux mots ou des mots différents en vue de l'expression; l'affaiblissement recommence et ainsi sans fin" (Meillet 1912: 140–141).

3 An exact picture of *ne* suppression has already been given (Martineau et Mougeon 2003): in old and middle French, *ne* is suppressed only as an exception; in classic French (17th–18th centuries), *ne* suppression is not frequent, whereas in Quebec modern French, the suppression is complete.

mechanism will predictably continue, with weakening affecting *pas* and a new negator (a *forclusive*) carrying the negative load. This is exactly what is observed in Quebec French (Déprez et Martineau 2003): *j'ai pas vu personne* contrasts with the standard French formulation *je n'ai vu personne* or the casual form *j'ai vu personne*.

In terms of the evolution of meaning of negative particles in French, what can now be said about the conceptual and the procedural meanings of *ne* ... *pas*? Obviously, *ne* is the bearer of the conceptual meaning as it appears in expletive negation, with negative verbs and conjunction, as in (563) and (564):

(563) Je crains qu' il ne vienne.
I fear that he NEG SUBJ-come
'I'm afraid he will come.'

(564) Marie est sortie avant que Pierre ne vienne.
Mary is went-out before Peter NEG come
'Mary went out before Peter arrived.'

I argue that *pas* is more procedural than conceptual: when *ne* is absent, as in (565), *pas* is the only negative trigger which can encode the negative meaning.

(565) Je sais pas.
I know NEG.
'I don't know'.

What could be these meanings be? The conceptual meaning of negation is typically the truth-conditional meaning. So, when *ne* is used in (563) and (564), even expletive, it strengthens the negative meaning of the utterance. Literally, *je crains qu'il ne vienne* can be translated as (566), and *avant que ... ne* in (567):

(566) I do not want [he comes]

(567) [before Peter comes] Mary has not gone out

As for the meaning of *pas*, we contend that it is more procedural than conceptual. The procedural meaning of *pas* allows the scope of negation to be determined – in particular, as chapter 8 argued, whether it scopes over the proposition expressed, its implicature or its presupposition. As proposed

before, *the locus of the semantic convention is the conceptual meaning*, whereas *the procedural meaning of the expression is its variation in meaning*. If this assumption makes sense, it might explain why functional meaning is pragmatically flexible to the same extent that conceptual meaning is determined. When the conceptual meaning is less determinate, then its procedural meaning should be strong. However, this is not the explanation given by post-Gricean approaches to connectives like *and* (Carston 2002), where conceptual meaning is reduced to logical meaning. As such, there is no place here for a procedural meaning, mainly because *and*-pragmatic meaning is contextually driven (see chapter 7).

This book's assumption is different: there is a clear and precise *conceptual* meaning, *and*-logical meaning, at the origin of entailments. As far as enriched meaning like *and*-causal meaning is concerned, the causal implicature extracts one possible relation from a set of possible and compatible relations with *and*, which is then exploited when certain contextual conditions are satisfied. So, the weakness of the conceptual meaning is directly proportional to the number of semantically compatible relations with its logical properties. This explains why *parce que* is conceptually strong: it is restricted to one conceptual relation, which is CAUSE.

This point can be illustrated with *metaphors*. Chapter 2 argued that the content lexicon could encode specific pragmatic instructions linked to the conditions of use of the lexical item: this part of the meaning was called *procedural*. The favourite example was the negative description of a car as a garbage can, or *poubelle* in French. Now, every French speaker knows that such a description of a car is non-literal, but the question is why it is possible. Our answer is that there must be, as for any type of metaphor, some property *P* shared between a garbage can and a car; if such a property can be found, then a description of a car as a *poubelle* is available. My hypothesis is that this link is exactly what the procedural meaning is. For instance, I cannot use any type of dirty item to describe a car. A *serpillère* 'mop' is inappropriate, because the substance of which cars and garbage cans are made is one of the crucial criteria: not only must it be dirty, it must be metallic. So, a good description of a car as a *poubelle* supposes that the car is not a clean car, but dirty, and made of metal, rather than plastic or cotton. If it applies to a brand-new clean car, the description would be inappropriate. My prediction is then that the possible extension of the denotation of *poubelle* is the result of its procedural meaning. Equally, anything metallic, old and dirty could be a *poubelle*, satisfying conceptual conditions and the definition of a closed object: a cup could never be a *poubelle*, but a van could be, as could a trailer. Extension of meaning would then be the result of procedural meaning. In a much more extreme version, polysemy would also be

predicted to be the result of a procedural meaning process: the domain of denotation is extended because some property *P* is shared and joins the conditions of use of the lexical item (that is, its procedural meaning).

So, one of the main findings of this book is that the conceptual vs. procedural meaning issue is not only a case of distributing types of meaning for lexical and function categories. The radical claim is that procedural meaning, being flexible, is the locus for meaning change in the evolution of language.

4 A conclusion of a conclusion

What is the conclusion of this book? It has focused on conceptual-procedural meaning, and on the semantics-pragmatics interface. What was discovered in the course of the analyses is that procedural meaning, as well as conceptual meaning, is pervasive, and that the locus of meaning variation is procedural meaning. This is not a trivial conclusion and can paint a new picture of how meaning is structured and how it can evolve. In terms of meaning structure, the main implication is that only procedural meaning is flexible, and is thus subject to change and evolution. As for language evolution, what has traditionally been described as a grammaticalization process in fact has an impact on procedural meaning. When a change of category occurs, as in the case of the negative operator *pas* 'footstep' or the proposition *chez* 'at', the change in category (from noun to adverbial or to preposition) impacts on its conceptual meaning, and the additional procedural meaning is the result of use. These changes of category, accompanied by changes in conceptual meaning, are exceptional. But even in these cases, there is a semantic motivation for the change in conceptual meaning: from a small distance measure to the absence of a property; from the description of a house to the location of a profession (the house of the profession). The full picture discussed in this book offers an explanation different from the classic grammaticalization view: according to the grammaticalization theory, what triggers the conventionalization of meaning is the progressive change from conversational to conventional meaning (see, for instance, Kay and Michaelis 2012). I predict a different type of process, linked not to conventionalization but to some radical shift. It has been argued, from a historical perspective, that complexity emerges suddenly, rather than being the result of a progressive and slow change (Lewis 1993). In other words, it should be expected that, when a change in category occurs, a radical change in conceptual meaning results.

This is an exceptional process. What generally happens is not a change in category, even if some connectives incur such results. As such, when there is a

change in meaning, it should impact on procedural meaning rather than conceptual meaning. This speculative outcome must now be tested empirically: if confirmed, a new theory of meaning change will emerge. If disconfirmed, a new and different puzzle will have to be answered, and new findings, new data, and more cross-linguistic studies will be needed, an endeavour for which the reader has my heartiest encouragement!

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