Chapter 5
A Pragmatic Model of Temporal Cohesive Ties

5.1 The *Highly Discriminatory* Model of Temporal Reference

Sections 4.2 and 4.3 described the experimental work carried out to investigate temporal reference, and the main cohesive ties contributing to its expression and processing in discourse. Corpus work revealed the absence of one-to-one cross-linguistic correspondences between verbal tenses. One of the divergences identified is the English Simple Past translation divergence. The analyses of bilingual and multilingual parallel corpora showed that the four verbal tenses most frequently used to translate the Simple Past into French, Italian and Romanian are three verbal tenses expressing past time (the compound past, the simple past and the imperfective), as well as the present tense. The question that arose regarded the linguistic and non-linguistic factors which explain this cross-linguistic variation. Experimental work revealed that, when interpreting a text, hearers take into consideration temporal information originating from several sources, and treat them as a coherent whole. Drawing from the literature available, several possible factors were defined and tested in the experimental work, using offline experiments involving linguistic judgement tasks regarding:

- The temporal localization of eventualities with respect to the moment of speech S;
- The temporal relations existing between eventualities, which can be either implicit or expressed explicitly by temporal connectives, operationalized as the [±narrativity] feature;
- The aspectual viewpoint of the eventuality, operationalized as the [±perfectivity] feature;
- The temporal information inherent to the eventuality (i.e. the lexical aspect of the verb phrase, to which temporal adverbials make a significant contribution), operationalized as the [±boundedness] feature.

Analysis of the results of the experimental work led to several conclusions. Firstly, the temporal localization of eventualities with respect to S is conceptual information encoded by Tense. Verbal tenses can therefore be classified as locating $E < S$ (i.e. pastness) or $E \geq S$ (non-pastness). Secondly, temporal relations existing between eventualities is procedural information encoded by Tense, which is the functional head of the sentence. This is a binary feature, whose value is determined pragmatically in every context, according to linguistic and non-linguistic factors. Thirdly, temporal information inherent to the verb phrase is conceptual information, and its value is computed contextually, according to the lexical aspect of the verb and other factors influencing it, such as temporal adverbials, countable/uncountable noun phrases and grammatical aspect.

In order to account for these conclusions, I propose a theoretical cross-linguistically valid reanalysis of temporal reference, which is empirically and experimentally supported. This cross-linguistic model is called the *Highly Discriminatory* model of temporal reference (HD), and aims to discriminate between the categories and principles that play a role in determining temporal reference, regardless of the language at which we look. One peculiarity of the HD model of temporal reference is the *granularity* of its features. It consists of medium-grained features, which are general enough to be applicable to a large range of phenomena linked to temporal reference in several languages, and precise enough to be theoretically accurate. Additionally, these features answer the requirement of Natural Language Processing tools to be implemented automatically, while being able to explain the various usages of verbal tenses and their translation. It is not just that two of the features included in the HD model (the [±narrativity] and [±boundedness] features) were successfully implemented for automatic processing; their implementation in Natural Language Processing and their application to Statistical Machine Translation produced significant improvements in these systems' results—improvements which represent an empirical, indirect and yet robust validation of these features (Meyer et al. 2013; Grisot and Meyer 2014; Meyer 2014; Loáiciga and Grisot 2016; cf. Chap. 7).

For Moeschler (1998b, 159), determining the temporal reference of an eventuality therefore requires virtual and actual temporal and lexical references:

> Un événement se caractérise par sa nature (c'est un événement de tel ou tel type, courir, manger, pleuvoir, etc.), par ses participants (agent ou patient), par ses circonstances spatio-temporelles (il s'est produit à un moment et dans un lieu donné) et par ses relations à d'autres éventualités, événements ou états. En d'autres termes, un événement est la projection complète, saturée, d'une référence temporelle virtuelle (temps verbal) sur une référence lexicale virtuelle (prédicat), combinée aux références actuelles des arguments de la phrase.[1]

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[1] 'An event is characterized by its nature (it is an eventuality of such and such a type, *run, eat, rain*, etc.), by its participants (agent or patient), by its spatiotemporal circumstances (it takes place at a certain moment and in a certain place), and by its relations to other eventualities (events or states). In other words, an eventuality is a complete and saturated projection of a virtual temporal reference (a verbal tense) onto a lexical virtual reference (a predicate), combined with actual references of the arguments of the verb phrase.' (my translation)

In other words,

- Virtual temporal reference is provided by Tense, by temporal coordinates E, R and S.
- Actual temporal reference is provided by the contextual saturation of temporal coordinates E, R and S.
- Virtual lexical reference is provided by the aspectual class of the verb (i.e. state, activity, accomplishment and achievement).
- Actual lexical reference is provided by the predicate and the arguments of the verb phrase, and determined contextually.

My assumption is that this picture represents only part of a larger image. I suggest that the global interpretation of temporal reference at the discursive level is determined by the linguistic means existent in a language on the one hand, and by their ad hoc inferential contextual saturation on the other. Fig. 5.1 provides a possible model of the functioning of temporal reference in discourse.

An initial distinction is proposed between the linguistic means typically used by tensed and tenseless languages. Tensed languages, such as the languages studied in this research, make use of TAM markers, namely *tense, aspect* and *mood*. In morphosyntactic terms, in the Minimalist program, these are *interpretable* features (Chomsky 1995, 2000; Cowper 2005): [±past] Tense, [±perfective] Aspect and [±realis] Mood, where the past, imperfective and irrealis are the marked forms (i.e. sentences are interpreted as perfective, non-past and realis in the absence of overt
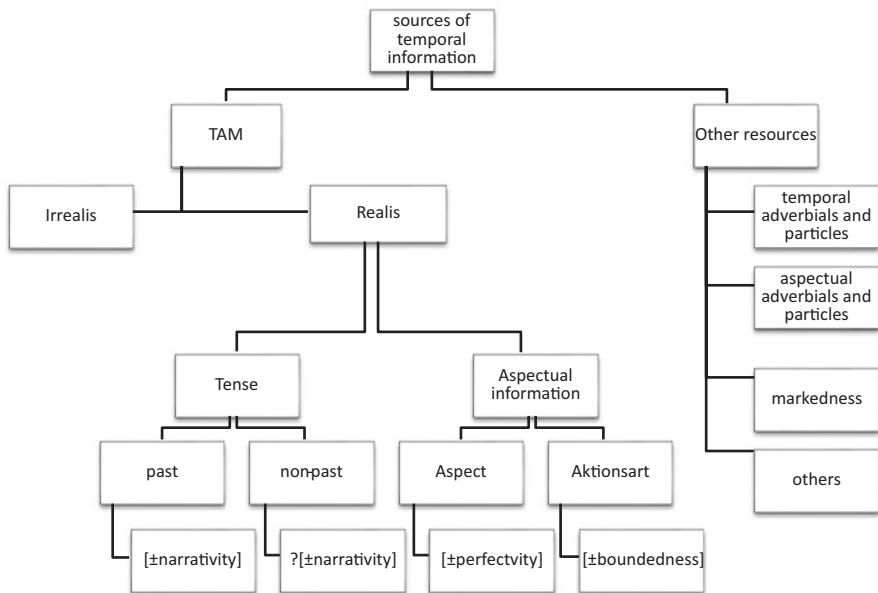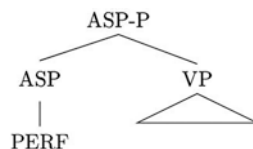

Fig. 5.1 Sources of temporal information

Fig. 5.2 Syntactic structure of an aspectual functional head ASP

markers indicating the contrary). Sentences in tensed languages have Infl (i.e. from Inflection, following Chomsky 1957, 1965) as their functional head (consisting of Tense and Agreement features).

Languages differ in terms of how they make use of the features. For example, it has been suggested that Romance languages have two separate projections of Infl—T-P (i.e. Tense phrase) and ASP-P—whereas English has only one, as argued by Giorgi and Pianesi (1997) for Italian and English, and Cowper (2005) for Spanish and English. In tenseless languages, like Mandarin Chinese, the speaker and the hearer make use of means of expressing temporal reference other than the Tense branch; the Aspect branch and the Other Resources branch are much more developed than they are in tensed languages. Lin (2012, and previous research) argued that sentences in tenseless languages have in their syntactic structure an aspectual functional head ASP, which plays the same role that the Tense head does in a tensed language. The aspectual head ASP-P can be perfective or imperfective, as shown in Fig. 5.2 for a perfective ASP-P.

According to Tonhauser (2015, 140), aspectual marking (i.e. both Aspect and Aktionsart) is implicated in temporal reference in Mandarin Chinese in two ways: (i) 'it mediates the temporal relation of the topic time [i.e. reference time in Reichenbachian terms] of one clause to that of the other', and (ii) 'leads to default inferences about the temporal localization of the topic time relative to the utterance time' (i.e. moment of speech S in Reichenbachian terms). For C. Smith (2008), in Mandarin Chinese, Aspect encodes the relation between reference time R and event time E (an idea initially suggested in Tedeschi & Zaenen 1981): for example, the *-le* perfective indicates that $E = R$, and the *-guo* perfective indicates that $E < R$. The relation between S and R is pragmatically inferred from Aktionsart (i.e. bounded vs. unbounded situations).

As is argued by Relevance Theory, during the general comprehension procedure, the hearer establishes temporal reference while determining the explicature of the utterance. This is a subtask which takes place in parallel with the determination of the implicated premises (also called contextual hypotheses) based on the context and of the implicated conclusions, which satisfy the hearer's expectations of relevance. This means that information provided by the other two sub-tasks is continually used for revision or elaboration of the task at hand while the utterance unfolds. Tense, Aspect and Aktionsart encode procedural and conceptual information, which guides the interpretation process either by contributing to or by constraining the content expressed. Conceptual information most often represents a pro-concept TIME which must be adjusted contextually, in the form of an ad hoc concept. Procedural information, on the other hand, operates at two levels: syntactic computation, and pragmatic interpretation. The layers of temporal meaning are summarized in Table 5.1.

Table 5.1 Layers of temporal meaning

Relevance-theoretic level	Conceptual/procedural information	Temporal reference	Inferential status	Truth-conditionality status
Explicature	Conceptual (contribution)	E/S; Aktionsart	Inferential	Truth-functional
	Procedural (constraining)	Narrative vs. non-narrative (via R) Perfective vs. imperfective		

Firstly, inflectional morphemes (temporal and aspectual) contribute to the content of the proposition expressed:

- The temporal localization of an eventuality with respect to S must be specified at the level of the explicature. It represents inferential and truth-functional content.
- The type of eventuality or Aktionsart with respect to its actual realization is inferentially processed at the level of the explicature: the [±boundedness] feature.

Secondly, the presence of inflectional morphemes (temporal and aspectual) in a sentence constrains the interpretative process:

- Tense instructs the hearer to order eventualities temporally. The result of this inference is an explicature, and it is truth-functional content.
- Aspect instructs the hearer to identify the speaker's viewpoint of the eventuality expressed. The result of this inference is an explicature, and it is truth-functional content.

The layered representation of temporal meaning established here is based on conceptual information contributing to the truth-conditional content of an utterance, and on procedural information constraining the formulation of the explicature and implicatures associated with an utterance. With respect to the temporal structure of an utterance/discourse:

- The hearer makes hypotheses at the explicit level about location of the eventuality or series of eventualities in Realis or Irrealis.
- If the Realis pathway is chosen, the hearer makes hypotheses about the contextual values of Tense and Aspect.
- As far as Tense is concerned, the hearer makes a hypothesis about location with respect to S: past (E < S) or non-past (E ≥ S).
- If the past time path is selected, a second hypothesis is made about the temporal localization of an eventuality with respect to another eventuality, operationalized as the [±narrativity] feature.
- As far as Aspect is concerned, the hearer makes hypotheses about the possible contextual values of grammatical viewpoints.
- As far as Aktionsart is concerned, the hearer makes hypotheses about the actual realization of (a)telicity.

This model contrasts with the proceduralist view of verbal tenses (de Saussure 2003, 2011; Aménos-Pons 2011). According to the proceduralist view, verbal tenses encode procedural information, which acts at two levels: that of the explicature, via type 1 procedural information; and that of the implicature, via type 2 procedural information. De Saussure (2003, 219) notes:

> Les temps verbaux orientent l'interprétation à plusieurs niveaux, mais dans les développements récents de la théorie de la Pertinence par les chercheurs genevois, l'hypothèse qui a été retenue et mise à l'épreuve stipule que les temps verbaux ont pour rôle premier de permettre la fixation de la référence temporelle. Les autres dimensions représentationnelles ("résultat dans le présent" pour le passé compose ou "expression d'un point de vue" pour l'imparfait) ne sont que des conséquences du processus général qui consiste à attribuer à un énoncé une référence temporelle selon le calcul que demande le temps verbal, calcul qui se fait sur une sémantique constante.[2]

In other words, the primary role of verbal tenses is to establish temporal reference, which is the 'temporal moment, in the hearer's consciousness, at which the truth-conditions of the eventuality are verified' (de Saussure 2003, 179, my translation); thus, they encode constraints on the explicature. Other forms of interpretative content triggered by verbal tenses, such as the resultative state relevant at S for the compound past, represent constraints on the formulation of implicatures (be they implicated premises or implicated conclusions).

The temporal sequencing phenomenon is, for de Saussure (2003), the result of the algorithm set up during the comprehension procedure, in which the hearer must determine a temporal relation holding between mental representations of eventualities. Thus, one must first explain the temporal sequencing phenomenon in order to explain temporal reference. This is because 'formulating an algorithm – a procedure – for calculating temporal sequencing implies providing the temporal reference of a process, as it is being processed, by connecting it to that of another process' (p. 183, my translation). Put another way, determining temporal reference at the explicature level depends on determining the temporal sequencing of eventualities, which is seen as a purely pragmatic phenomenon.

As for the role played by Aspect and Aktionsart in determining temporal reference (as understood by de Saussure) and temporal sequencing phenomena, the proceduralist view insists on the essential role played by Aspect, and the reduced contribution of Aktionsart. For example, when processing the sentences in (483) and (484), from de Saussure (2003, 179), the hearer does not determine a temporal interval, lasting from a few seconds in the former to a few hours in the latter, but a punctual and bounded cognitive representation of the eventuality. This is mainly due to the assumption that the Passé Simple is a perfective verbal tense, and this

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[2] 'Verbal tenses guide the interpretation at several levels, but in the recent developments of Relevance Theory by researchers from Geneva, the hypothesis retained and tested stipulates that the main role of verbal tenses is to allow the fixing of temporal reference. The other representational dimensions ('resultative state in the present' for the compound past or 'the expression of a point of view' for the imperfect) are only the consequences of the general process, which consists in attributing temporal reference to an utterance according to the calculation required by the verbal tense, a calculation based on constant semantics.' (my translation)

overrules the inherent temporal information given by the situation type (achievement in (483) and activity in (484)).

(483)   La bombe *explosa*.
        'The bomb exploded.'
(484)   Frédéric et Marie-Hélène *emplirent* la piscine.
        'Frédéric and Marie-Hélène filled the pool.'

In (485), containing the telic eventuality *courir le 1500 mètres* 'run the 1500 meters' (accomplishment), the hearer builds an unbounded cognitive representation, due to the Imparfait. De Saussure argues that the Imparfait imposes an imperfective reading of eventualities, despite their type (state, activity, accomplishment or achievement).

(485)   Luc *arriva* au stade. Augustin *courait* le 1500 mètres.
        Luc arrive.PS at the stadium. Augustin run.IMP the 1500 meters
        'Luc arrived at the stadium. Augustin was running the 1500 meters.'

Therefore, it is Aspect rather than Aktionsart, defined in terms of telicity, which seems to play an important role in determining the temporal sequencing of eventualities (the contrary has been argued by Dowty 1986, who proposed a model of temporal information in the discourse based on Aktionsart). For de Saussure, it is clearly necessary to dissociate the ontological classification of eventualities (Aktionsart) from the mental representation of eventualities, which seems to be independent of the type of eventuality itself, and dependent on Aspectual viewpoint.

In conclusion, based on the corpus-based contrastive and experimental work discussed in this book, I propose a slightly different view of temporal reference. First of all, the hearer deals with temporal information that might be provided by various sources at the explicature level (Mood, Tense, Aspect, Aktionsart, temporal adverbials, temporal connectives, and world knowledge, such as the knowledge that *being sick* is generally previous to and the cause of *going to the doctor*). In this book, temporal information—such as the localization of eventualities with respect to the moment of speech and to one another—falls under the label of *temporal reference*. In tensed languages, it is suggested that this is encoded by the category of Tense at two levels (conceptual and procedural), where in languages that do not have the category of Tense, it is expressed by way of Aspect, Aktionsart, Mood, etc. A feature common to both the HD model of temporal reference and de Saussure's procedural-ist view of temporal reference is that the various sources of temporal information are dealt with not at the purely linguistic level but at the cognitive level of mental representations. For example, Aktionsart is dealt with not in terms of its virtual lexical reference (ontological features such as telicity) but its actual lexical reference, determined contextually in terms of boundedness (cf. Sect. 1.2.2).

The empirical research described in this work dealt with two branches: the *tense* branch, expressing past time reference, and the *aspect* branch, applied to verbal tenses expressing past time reference. It focused on three verbal tenses in particular:

the simple past; the compound past; and the imperfective. Due to the specific applied purpose of this research regarding machine translation, there are other verbal tenses expressing past time reference which were not considered, such as the pluperfect, the present and the English past progressive. As for the *tense* branch expressing non-past time reference, I have discussed the simple present in four languages as they are outlined by classical grammars (cf. Sect. 1.1.4). In this research, this verbal tense was not tested experimentally with respect to the procedural [±narrativity] feature.

5.2   Tense: A Mixed Conceptual-Procedural Temporal Category

5.2.1   The Notion of Context

In this section, I would like to discuss the notion of *context*, which is an essential element of the model developed in this book. Before defining context as it is used in this research, and the role it plays in determining temporal reference, I would like to establish a series of definitions and usages of this notion in semantics and pragmatics. The notion of context is generally used in the literature with three senses: the actual discourse event, involving the speaker and the hearer; the linguistic content of the verbal exchange with syntactic and prosodic structures; and finally, the structure of the information that is presupposed and/or conveyed by the interlocutors in an exchange (Roberts 2004, 197–198). Despite the fact that researchers often tend to focus on only one of the three senses, these three characterizations of discourse context are not mutually exclusive. For semanticists, the context is seen as consisting of a set of objectively *true mental representations* which interlocutors share during communication (for example, Kratzer's *conversational background*, developed within the framework of Possible Worlds Semantics for the analysis of modal constructions; Kratzer 1977, 2012); for pragmaticists, on the other hand, context is a more flexible and subjective notion[3] referring to *assumptions* rather than true facts about the world (for example, Relevance Theory's mutual cognitive environment or context consisting of a set of assumptions).

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[3] Grice (1989, 65) speaks about *common ground* as the presumed background information shared by participants in a conversation. This notion was used by Stalnaker to analyse presuppositions. For him, *common ground* is reducible to *common belief*: 'The common beliefs of the parties to a conversation are beliefs they share, and that they recognize that they share: a proposition φ is common belief of a group of believers if and only if all in the group believe that φ, all believe that all believe it, all believe that all believe that all believe it, etc.' (Stalnaker 2002, 704). As pointed out by Blochowiak (2014a, b, 67), the proponents of Relevance Theory have criticized Stalnaker's notion of *common ground* on two points: (i) it is cognitively improbable, because the conditions required for the construction of the common ground impose a regression *ad infinitum*; and (ii) it is an unnecessary and undesirable condition for communication, which does not explain misunderstanding and errors in communication.

In this research, the notion of context is defined as encompassing the *cotext* and the *background*. More precisely, the cotext refers to (i) the actual discourse event involving the speaker and the hearer, and (ii) the linguistic content of the verbal exchange which has syntactic and prosodic structures. I will refer to this with the capital letter C.

Regarding background information, I adopt Blochowiak's (2014b) notion of *pragmatic background*, which relies on Kratzer's conversational background with respect to its technical formalization, and on the relevance theoretic notion of context with respect to its flexibility and cognitive plausibility. For Blochowiak, the pragmatic context is *a set of propositions believed or known to be true by the speaker in a given situation*, where a proposition can be attributed a truth-value (Blochowiak 2014b, 58). More formally (Blochowiak 2014b, 59),

> A proposition p belongs to a background of a speaker s at time t if and only if the speaker s believes at time t that p is true.

In other words, the propositional pragmatic background (or just *background*, as Blochowiak suggests) of a speaker *s* is the set of all propositions believed by *s* at time *t* to be true. In any situation, the background of any speaker is a structured set consisting of several classes of propositions. Blochowiak distinguishes between *general* propositions (also called *generalized propositions* or *laws*) and *individual* propositions. Generalized propositions include generic statements, as in (486) and (487), general rules which are law-like statements about some general truth, as in (488), and abnornic laws which are exceptions from the law-like rules, as in (489).

(486)   The oak tree was destroyed by extensive ship construction in England. (Blochowiak 2014b, 25)
(487)   Birds fly. (Blochowiak 2014b, 25)
(488)   All French nouns form their plural by adding *s*. (Blochowiak 2014b, 28)
(489)   All French nouns form their plural by adding *s* unless they end in *al* (except *bal, carnaval*), or in *eu* or in *au*, or in *ou* (except *pneu, genou*, etc.) or *x* or *z* or *s*. (Blochowiak 2014b, 28)

Within the class of individual propositions, she distinguishes between *regular* and *random* propositions. Regular propositions refer to states of affairs described as being regular (such as states of affairs predicted by causal rules, purposive rules, psychological rules concerning human actions, biological rules, etc.) or random (referring to states of affairs which cannot be predicted by rules such as those mentioned above).

The background consisting of these two types of propositions (generalized and individual propositions) can be complemented by different sorts of cognitive attitudes, such as epistemic, evidential, bouletic, etc. Following Kratzer's classification of different kinds of conversational backgrounds, Blochowiak defines four types of such backgrounds (Blochowiak 2014b, 60), which I will simplify as follows:

- Doxastic background: the set of propositions speaker *s* believes at *t*
- Epistemic background: the set of propositions speaker *s* knows at *t*
- Evidential background: the set of propositions speaker *s* has evidence of at *t*
- Bouletic background: the set of propositions speaker *s* wants at *t*

In a given situation, the speaker has a general background, which comprises all she knows, believes, wishes, has evidence of, etc. at a certain moment. We can refer to this general background, consisting of the sum of all propositions from all backgrounds, with the capital letter B.

As noted above, the notion of context, as it is understood and used in this research, encompasses the notions of cotext and of background. Therefore, the context in which the speaker interprets an utterance can be formally described as:

(490)   ConText = {C, B}

My understanding of the notion of context does not differ from that proposed by Relevance Theory, and defended by Assimakopoulos (2017). ConText is a cognitive construct consisting of a set of assumptions pertaining to C and B, which is (i) selected during the interpretation process, rather than determined in advance of it, and (ii) expanded during the interpretation process, when the expectation of relevance is satisfied or abandoned.

5.2.2   Reichenbachian Coordinates: E and S

Before detailing my understanding of the conceptualist view of Tense via contextual saturation of E and S, I would like to discuss the notions of *variable* and *saturation* in formal semantics (Fregean semantics, following Heim and Kratzer 1998) and in pragmatics (discursive pragmatics, following Moeschler and Reboul 1994). The notions of *variable* and *saturation* come from Frege's idea of compositional semantics. For him,

> Statements in general, just like equations or inequalities or expressions in Analysis, can be imagined to be split up into two parts; one complete in itself, and the other in need of supplementation, or 'unsaturated'. Thus, e.g., we split up the sentence 'Cesar conquered Gaul' into 'Cesar' and 'conquered Gaul'. The second part is 'unsaturated' – it contains an empty place; only when this place is filled up with a proper name, or with an expression that replaces a proper name, does a complete sense appear. Here too I give the name 'function' to what this 'unsaturated' part stands for. In this case, the argument is Cesar. (Frege 1948, in Heim and Kratzer 1998, 3)

Hence, for Frege, unsaturated meanings are functions, which take arguments. As a process, saturation consists in the application of a function to its arguments. In set theory (Heim and Kratzer 1998, section 1.3), functions are sets of a certain kind, where a *set* is a collection of objects, which are called *members* or *elements*. A set can also be defined by *abstraction*, which means specifying a *condition* which is to be satisfied by all and only all the elements of the set to be defined. For example,

(491)   Let A be the set of all cats.
(492)   Let A be the set which contains exactly those *x* such that *x* is a cat.
(493)   A := {x : x is a cat}

The notations in (492) and (493) (to be read as 'the set of all *x* such that *x* is a cat') defines the same set as (491) by abstraction: the condition to be satisfied by all and only all the elements of the set is to be a cat. The letter *x* does not stand for a particular object, but functions as a kind of place-holder or *variable*. To determine if a particular object is a member of A, one has to replace the name of the candidate object—let's say Minette—in the condition '*x* is a cat'. If the statement is true, then the candidate object, Minette, is a member of the set A (Minette ∈ A).

Having discussed their formal semantic usage, I will now turn to the usage of the notions notions *saturation* and *variable* in discourse pragmatics (following Moeschler and Reboul 1994). According to Milner (1982, in Moeschler and Reboul 1994, 501), a linguistic expression has three dimensions, which in combination allow it to be identified: its phonological form; its lexical meaning; and its grammatical category. If one of these dimensions is absent or insufficient, the following principle applies: 'an incomplete linguistic expression must be able to receive the dimensions it needs' (Milner, in Moeschler and Reboul 1994, 502). This principle refers to the process of *saturation*, which is, as argued by Milner, a pragmatic process drawing on the discursive context and/or the linguistic cotext. For example, in case of pronominal anaphorical reference compared to deictic pronominal reference, the sources of information necessary for the saturation process are not the same for the two types of pronominal reference. More precisely, saturating an anaphorical pronoun draws on the cotext, whereas saturating a deictic pronoun draws on the discursive context. In this book, the process of saturation involved in reference assignation is understood as targetting the relation between a linguistic expression and a non-linguistic entity—i.e. a mental representation, where mental representations are the interface between linguistic entities and world entities (Reboul 2000).

In Relevance Theory, the notion of *saturation* is a 'linguistically mandated completion', which concerns pragmatic developments of the logical form necessary to derive the explicit content of an utterance (Carston 2004, 637). For Carston, saturation is a more widely manifest process than the simple finding of values for overt indexicals, such as pronouns. She suggests that saturation takes place for words such as *better, same, too, enough*, etc.

(494)   a. Paracetamol is better. [than what?]
         b. It's the same. [as what?]

Similarly, Relevance Theory has rejected Ducrot's notion of *variable* (Anscombre and Ducrot 1983) used to refer to linguistic meaning, which is the result of a purely linguistic analysis of phrases. Linguistic meaning as a variable must be saturated during the subsequent pragmatic analysis, which takes place in the context. For Anscombre and Ducrot, these variables represent schematic linguistically encoded

procedures concerning the possible usages of the language[4]. Ducrot's integrated pragmatics predicts a clear-cut border between the linguistic and the pragmatic levels of analysis. Relevance Theory has shown that pragmatic processes already take place at the level of the linguistic analysis (cf. the relevance-theoretic notion of explicature), and that the border is more flexible than Ducrot predicts.

I would like now to present the way in which I use the notions of *saturation* and *variable* in this research. I make three suggestions: (i) the Reichenbachian temporal coordinates E, S and R are temporal variables; (ii) their configuration is saturated in the ConText; and (iii) their configuration takes place at the conceptual level.

According to the first suggestion, the event moment, the speech moment and the reference moment are variables or place-holders for actual temporal moments (be they moments or intervals). (495) is read as 'Let E be the set of all *e* such that *e* is an event moment'; (496) is read as 'Let S be the set of all *s* such that *s* is a reference moment'; and (496) is read as 'Let R be the set of all *r* such that *r* is a reference moment'.

(495) $E := \{\, e: e \text{ is an event moment} \,\}$
(496) $S := \{\, s: s \text{ is a speech moment} \,\}$
(497) $R := \{\, r: r \text{ is a reference moment} \,\}$

In other words, in the ConText, a series of temporal moments is available: either an event moment belonging to the set E; a speech moment belonging to the set S; or a reference moment belonging to the set R. To interpret an utterance, the hearer must determine in the ConText the configuration of these coordinates (their temporal precedence or simultaneity). In particular, as I will be arguing below, the configuration between E and S takes place at the conceptual level, whereas the configuration between E and R takes place at the procedural level. I suggest a *mixed conceptual-procedural* view of Tense, according to which the hearer makes use of pragmatic inferences in order to recover the speaker's meaning with respect to the temporal localization of eventualities. This takes place on two levels: the ad hoc narrowing of the pro-concept TIME by way of the *contextual saturation of two Reichenbachian coordinates,* the variables E and S; and relating eventualities with respect to one another (that is, the [±narrativity] feature making use of the R coordinate).

This mixed view of Tense is compatible with the relevance-theoretic vision that a linguistic expression may encode both types of information, and that they are not therefore mutually exclusive. This view has been put forward for discourse markers (Fraser 2006), connectives (Moeschler 2002a for French *et* "and" and *parce que* "because"; de Saussure 2011 and Blochowiak 2014b for *parce que* "because"), temporal adverbials (Wilson 2011 for *then*), illocutionary adverbials (Fraser 2006) and referring expressions (Scott 2011), among others. As pointed out by Scott (2011),

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[4] However, for Ducrot and Anscombre, utterances do not communicate states of affairs in the world but acts (such as promises, assertions, argumentations, orders, etc.), and linguistic meaning is *auto-référentiel* 'self-referential', which means that understanding the meaning of an utterance is equal to understanding the type of act it performs.

during the relevance-theoretic comprehension procedure, the hearer makes use of conceptual and procedural information encoded by referring expressions in order to determine an utterance's explicit and implicit content. Firstly, the hearer makes use of the conceptual information of the referring expression to rule out those potential referents which are not intended by the speaker. For example, in (498) and (499), the conceptual conditions imposed by referential expression are *primitive reptiles*, which narrows the set of potential referents to include only (sets of) referents which are both primitive and reptile. Moreover, the procedural information encoded by the determiner further narrows the set to include only definite (i.e. identifiable) groups of primitive reptiles (Scott 2011, 193). The difference in acceptability between (498) and (499) lies at the implicit level—i.e. the type of implicature the hearer is encouraged to make. The complex determiner in *these N* encodes a contrast between a proximal and a non-proximal referent/group of referents, which is not available with the definite determiner in *the N*.

(498)   A restudy of pareiasaurs reveals that *these primitive reptiles* are the nearest relatives of turtles. (Gundel and Mulkern 1998: 27)

(499)   ?A restudy of pareiasaurs reveals that *the primitive reptiles* are the nearest relatives of turtles. (Gundel and Mulkern 1998: 27)

The proposal of a mixed conceptual-procedural view of Tense is based on the following arguments. The first is linked to the cognitive foundations of the conceptual/procedural distinction proposed by Wilson and Sperber (1993), and the parallel between this distinction and the *declarative/procedural* model (DP) of the contribution of memory to language (Ullman et al. 1997; Ullman 2004). This parallel can be established with respect to the behaviour and functions of conceptual information/declarative memory on the one hand, and procedural information/procedural memory on the other. The second argument is the relevance-theoretic description of the conceptual and procedural distinction as *contributing* vs. *constraining* the interpretative process.

The first argument relates to the highly striking commonalities between the conceptual/procedural distinction and Ullman's DP model, which provide a better understanding of conceptual and procedural types of information, allowing us to formulate hypotheses regarding the cognitive processing of linguistic expression, encoding one or both types of information. Some of these common features have already been discussed in the literature (such as Wilson & Sperber's cognitive foundations of this distinction), whereas others have yet to be integrated into a relevance-theoretic model. These three commonalities are as follows: firstly, conceptual information learnt by the declarative system is consciously or explicitly recollected; secondly, that procedural information and procedural memory are generally not consciously accessible (although when the rules themselves are rendered explicit, they help to guide the processing of the utterance); thirdly, the declarative and procedural memory systems depend on distinct neural systems, but their regular interactions form a dynamically interacting system. Consequently, one would expect that a single expression could be dealt with by both the declarative and the procedural systems. As a result, it can encode both conceptual and procedural types of information.

The prediction based on first commonality was tested and validated in the experiment reported in Sect. 4.2.2, in which native speakers of French were provided with sentences in which the verb occurred in the infinitive form. Their task was to determine contextually the tensed form for each of the two conditions: past (E < S), and non-past (E ≥ S). All of the participants correctly provided either a past time or a non-past time verbal tense, for both artificial data ($K = 1$) and natural data ($K = .80$). This very high agreement rate is due to the fact that this information, which is conceptual, is consciously and explicitly recollected from the memory according to the information available in the ConText. In (500) and (501), the hearer finds in the ConText a series of temporal moments which belong to the E set and the S set.

(500)   Mon voisin aime jouer au casino. Il a tout perdu. Il est en dépression car il (être) très riche.
'My neighbor loves to play at the casino. He lost everything. He is depressed because he (to be) very rich'.

(501)   Mon voisin est propriétaire de sa maison, d'un chalet à la montagne et d'une très belle voiture. Il (être) très riche.
'My neighbor owns a house, a chalet in the mountains and a very beautiful car. He (to be) very rich.'

Based on background information (the individual regular proposition, which is to say the causal and temporal sequencing relation between *be rich – lose everything – be depressed*), the hearer determines in (500) that the localization of the eventuality *be rich* is in the past: E < S. In (501), the background provides a different individual regular proposition, the causal relation between *be rich – own several houses and beautiful cars*, according to which the hearer determines that the localization of the eventuality *be rich* is in the non-past: E ≥ S. As I have already argued in Chap. 4, as well as in Grisot (2017a), this experiment indicated that speakers have no difficulty consciously evaluating the localization of eventualities with respect to the moment of speech. These high K values of 0.80 for natural data and 1 for built examples suggest that this information is highly accessible to conscious thought, and easily conceptualized. According to Wilson & Sperber (1993/2012), this type of behaviour corresponds to conceptual meaning. Dealing with this kind of information is not cognitively costly, because it points to concepts that speakers have already acquired and deal with in every utterance: the localization of eventualities in the past or in the present. As I will discuss in Sect. 5.2.3, this systematic behaviour of native speakers contrasts with the cases when they consciously deal with information that has a procedural nature. When participants evaluate procedural meaning encoded by a linguistic expression, the procedure is automatically executed, regardless of contextual assumptions. This procedure leads to a specific pragmatic inference, whose result depends on the contextual assumptions formulated. Consciously evaluating this type of meaning, which is not available to consciousness, is a rather difficult task for annotators. This is shown by their systematic behaviour when judging procedural information: the inter-annotator agreement rates are moderate.

The second argument is purely theoretical, and is based on the description of conceptual and procedural types of information as respectively contributing to and constraining the interpretation of utterances. For example, Nicolle (1998, 4) argues that tense markers impose constraints on the determination of temporal reference, and thus "may be characterized as exponents of procedural encoding, constraining the inferential processing of conceptual representations of situations and events". Concerning the status of the temporal coordinates, de Saussure and Morency (2012) argue that tenses encode instructions on how the eventuality is to be represented by the hearer according to the positions of temporal coordinates. As such, they consider that temporal localization with the help of S, R and E is of a procedural nature, thus defending a *fully procedural* view of Tense (cf. Nicolle 1997, 1998; Moeschler 1994, 1998a, b; Moeschler et al. 1998; Aménos-Pons 2011, de Saussure 2003, 2011).

In the following paragraphs, I will argue that location according to temporal coordinates does not constrain inferential processing, but contributes to the propositional content of the utterance. In essence, the proposal is as follows. Contextual saturation of the configuration of the Reichenbachian variables E and S is performed at the conceptual level, in order to determine the propositional form of the utterance. Contextual knowledge necessary during this task within the relevance-theoretic interpretative procedure comes from the ConText (as defined in Sect. 5.2.1). It is essential to remember that the sub-tasks of the relevance-theoretic interpretative procedure are performed in parallel. This means that the hearer's hypothesis about the intended contextual assumption (corresponding to the contribution of the ConText) and intended contextual implication may be "revised or elaborated as the utterance unfolds" (Wilson and Sperber 2004, 621).

Wilson and Sperber (1993, 151) argue that conceptually encoded information contributes either to explicatures (to the proposition expressed and to high-level explicatures) or to implicatures, whereas procedurally encoded information represents constraints, either on explicatures (to the proposition expressed and to high-level explicatures) or on implicatures (cf. Sect. 2.3.2). They argue for the idea that, during the interpretation process, the hearer builds conceptual representations and uses encoded procedures to manipulate them. A conceptual representation differs from other types of representations in that it has logical properties and truth-conditional properties. The sentence in (502) has the logical form in (503), and the propositional form in (504). They argue that the logical form, recovered by decoding, and the propositional form, recovered by a combination of decoding and inference, are conceptual representations.

(502)   Peter told Mary that he was tired.
(503)   x told y at t_i that z was tired at t_i.
(504)   Peter Brown told Mary Green at 3.00 pm on June 23 1992 that Peter Brown was tired at 3.00 pm on June 23 1992.

The hypothesis advanced here is that the configuration of the temporal coordinates S and E is conceptual information acting as *pro-concepts* (Wilson 2011, Sperber and Wilson 1998). Pro-concepts are semantically incomplete: they are conveyed in a given utterance, and have to be worked out contextually by a pragmatic enrichment process, similar to lexical-pragmatic processes. The pro-concept TIME can be specified, by way of narrowing, in the ad hoc concepts of pastness (i.e. $E < S$) and of non-pastness[5] ($E \geq S$). Tense encodes this base semantic and conceptual information, and is contextually worked out according to the ConText. Due to repeated and constant activation of the same ad hoc concept, certain verbal tenses became specialized such that they activate the concept of pastness, where the specialization of others activated the concept of non-pastness (a similar account of interjections is given by Padilla Cruz 2009). For example, the classically described 'verbal tenses expressing past time', such as the compound past, simple past, imperfect and pluperfect, have undergone this specialization for the ad hoc concept of pastness. However, this does not stop a verbal tense from making reference to another time, or no time at all, if contextual information directs it.

This temporal information is not defeasible—i.e. unable to be cancelled in a given ConText. Consider Wilson and Sperber's example (1993, 157) in (502), and the propositional form in (504). I add to this propositional form the information that the eventualities of *saying* and *being tired* took place before the moment when the sentence was uttered. The extended propositional form would be something like the one given in (505). This temporal information cannot be cancelled, nor contradicted, as shown by the incompatibility in the given ConText with the adverbs *now* and *tomorrow*, in (506) and (507), as well as the compatibility with the adverb *yesterday*, in (508).

(505)   Peter Brown *told* Mary Green at 3.00 pm on June 23 1992 (a moment
        before the present moment/in the past) that Peter Brown was tired at
        3.00 pm on June 23 1992 (a moment before the present moment/in the past).
(506)   *Peter Brown *told* Mary Green at 3.00 pm on June 23 1992 which is now
        (a moment contemporary with the moment of speech)/tomorrow
        (a moment which is after the moment of speech) that Peter Brown
        was tired at 3.00 pm on June 23 1992 which is now/tomorrow.
(507)   *Now/tomorrow*, Peter *told* Mary that he was tired.
(508)   *Yesterday*, Peter *told* Mary that he was tired.

The contextual values and the relation between S and E (i.e. $E < S$ for past and $E \geq S$ for non-past) are pragmatically determined in the ConText. As suggested above, the pro-concept TIME is specified by narrowing to an ad hoc concept accord-

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[5]As with lexical pragmatics, where, for example, the pro-concept OPEN may be specified to numerous ad hoc concepts (e.g. open a can, open a door, open a bank account, open a file, etc.), one can image that the pro-concept TIME can be narrowed to express more specific categories of temporal remoteness (such as in Bantu languages, cf. Comrie 1985), omnitemporality (E holds *before*, *at* and *after* S) and atemporality. A future study investigating this matter empirically (with corpus-based study) and experimentally is necessary.

ing to contextual linguistic and non-linguistic information. Therefore, in an appropriate ConText, a verbal tense may convey a different ad hoc concept than that for which it has become specialized. In certain ConTexts, the simple present may locate the event in the past (E < S), as shown in (509), (510), (511) and (512). These cases correspond to what the literature calls the historical present[6].

(509)   En 1789, le peuple de Paris *prend* la Bastille. (Riegel et al. 1994)
        In 1789, people from Paris take.3SG.PRES the Bastille.
        'In 1789, people from Paris took the Bastille.'

(510)   In armonia con questo giudizio, Andreotti *compie* con regolarità,
        a Firenze, dove era nato il 15 marzo 1924, gli studi medi...
        (Bertinetto 1986)
        According to this opinion, Andreotti carry out.3SG.PRES regularly
        in Florence, where born.PC on 15th of March 1924, his medical studies
        'According to this opinion, Andreotti regularly carried out his medical
        studies in Florence, where he was born on 15th of March 1924.'

(511)   Ieri *am fost* la Ploiești. *Am mers* cu trenul. În compartiment, *văd* o figură
        cunoscută. (Zafiu 2013)
        Yesterday go.1SG.PC to Ploiești. I go.1SG.PC by train. In the compartment,
        I see.1SG.PRES a familiar face
        'Yesterday I went to Ploiești. I went by train. In the compartment I saw
        a familiar face.'

(512)   I couldn't believe it! Just as we arrived, up *comes* Ben and *slaps* me
        on the back as if we'*re* life-long friends. 'Come on, old pal,' he *says*,
        'Let me buy you a drink!' I am telling you, I nearly fainted on the spot.
        (Quirk et al. 1985)

If we consider example (513), and imagine two different ConTexts, the distance on the timeline between E and S—even if S = E for present tenses—is contextually adjusted according to world knowledge. In the first ConText, a husband and wife are at home, he upstairs and she downstairs; he calls her, and she answers (513). In the

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[6] A different approach to the historical present is provided by Schlenker (2004). Following Banfield (1982) and Doron (1991), he suggests that the notion of *context of speech* should be split in two subtypes: *context of thought,* and *context of utterance.* For Schlenker, the context of thought is the point at which the thought originates, and it includes a thinker, a time of thought and a world of thought. The context of utterance, on the other hand, is the point at which the thought is expressed, and it includes a speaker, a hearer, a time of utterance and a world of utterance. He argues that this distinction is particularly relevant in Free Indirect Discourse (FID) and narrations in the historical present. Schlenker's claim is that: (i) in ordinary discourses, the context of utterance and the context of thought are identical, and correspond to the actual context of speech; (ii) in FID, the context of utterance and the context of thought are different, the actual context being the context of utterance; and (iii) in narrative present sequences, the actual context is the context of thought, and the context of utterance is presented as having its time coordinate in the past. Moreover, he argues that tenses and pronouns depend on the context of utterance, while other indexicals depend on the context of thought. Tenses and pronouns are variables whose domains of reference are determined by the grammatical features they carry, such as gender, person and tense.

second ConText, the wife has an hour's ride from work to home; he calls her to see when she is coming back home, and she answers (513). The distance between E and S lies somewhere between immediately and 2–3 minutes in the first ConText, and a few minutes and an hour (or even more) in the second.

(513)   J'*arrive*!
        I arrive.1SG.PRES
        'I am coming!'

Another example is the compound past in Romance languages, which allows for reference to both past and future time. In (514), the French Passé Composé, which is specialized to express the ad hoc concept of pastness, locates the eventuality of *finishing* prior to S. In (515), on the other hand, the hearer builds an ad hoc concept of non-pastness making use of linguistic information, in particular the temporal adverb *tomorrow,* and therefore the utterance expresses reference to future time (i.e. E > S). Since the building of the ad hoc concept and the computation of the instructional content, operationalized as the [±narrativity] feature, are simultaneous cognitive processes, the hearer can readjust his initial hypotheses during the interpretative process.

(514)   J'*ai fini* mon livre.
        I finish.1SG.PC my book
        'I *finished* my book.'
(515)   *Demain*, j'*ai fini* mon article.
        Tomorrow I finish.1SG.PC my article
        'Tomorrow, I *will have finished* my paper.'

The corpus-based contrastive analysis discussed in Chap. 3 provided evidence that translating conceptual information leads to little cross-linguistic variation, whereas translating procedural information is source of substantial variation. This quantitative feature makes use of Moeschler's et al. (2012) suggestion that conceptual information is easily translatable, whereas procedural information is far harder to translate. This suggestion is linked to the fact that conceptual information represents concepts that are constituents of the language of thought, and therefore language-independent. According to this observation, it is to be expected that translating conceptual information leads to a small degree of variability in the target language(s), whereas translating procedural information leads to a high degree of variability. In Grisot and Costagliola (2014), and in Sect. 3.4, it was shown that verbal tenses expressing past time are used to translate the English Simple Past into three Romance languages in more than 70% of cases (73% in French, 72% in Italian and 83% in Romanian) whereas the simple present is used in fewer than 8% of cases (8% in French, and 5% in Italian and Romanian). Hence, choosing between the two possible ConTextual values of the pro-concept TIME is straightforward.

To sum up, in the HD model of temporal reference, the category of Tense encodes the broad pro-concept TIME. Each verbal tense in a language is constantly used to make reference to past or non-past (a distinction also recognized in neurolinguistics,

see Sect. 6.4) and thus becomes specialized to these ad hoc concepts. In other situations, a verbal tense does not have a temporal interpretation. My hypothesis is that the procedural information encoded by Mood (i.e. realis vs. irrealis) constrains the building of the ad hoc concept. In all cases, the hearer is led to make inferences regarding the ad hoc conceptual meaning of a verbal tense, and these are constrained by the procedural types of information encoded by Tense and Aspect. Section 5.2.3 is dedicated to the procedural information encoded by Tense.

5.2.3   *[±Narrativity] and Reichenbachian R*

The procedural information encoded by verbal tenses helps the hearer to access the right contextual hypotheses, conforming to the communicative and cognitive principles of relevance, to arrive at the intended cognitive effects (Wilson and Sperber 1998). Carston (1998) points out that, under normal conditions, discourse material is presupposed to be relevant and, when information is not explicitly given, it is filled in. The linguistic content of utterances is thus enriched in the interpretive process. In this case, the basic temporal localization of the eventuality (E/S) is complemented by procedural information. In (516), Binnick (2009), following Grice[7] (1989), argues that the material in brackets is implicit. The sentence in (516) is an example of temporal ordering, and thus the procedural feature [±narrativity] of the Simple Past is active.

(516)   He took off his boots and [*then*] got into bed.

The [±narrativity] feature makes reference to the MCPM (*mixed conceptual-procedural model*) of verbal tenses (Moeschler et al. 2012; Grisot and Moeschler 2014; Moeschler 2016), according to which verbal tenses have robust conceptual semantics given by the configurations of Reichenbachian coordinates and by three procedural hierarchical features: [±narrative] > [±subjective] > [±explicit]. Experimental work carried out in this research, and in Grisot (2017b), has allowed me to refine this model, by partly validating and partly challenging the theoretical assumptions behind it. The challenges are twofold. The first relates to the nature of R: either conceptual, together with E and S in the MCPM model, or procedural, together with the [±narrativity] feature in the HD model of temporal reference. The second relates to the nature of the [±subjective] feature: either procedural in the MCPM model, or pragmatic in Grisot (2017c). I will first discuss the [±subjective] feature, and the reasons for which it is not included in the HD model of temporal reference, and then come back to the [±narrativity] feature as it is understood and used in the MCPM and HD models.

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[7] Binnick's example is a typical example of conversational implicatures (in the terms of Grice 1989) that follow the maxim "Be orderly". Carston (1998, 2002) and Sperber and Wilson (1986/1995) treat this content as pragmatically determined aspects of what is said, and thus as an explicature. See Blochowiak (2014a, b) for a presuppositional account of temporal and causal connotations of 'and'.

Grisot (2017c) reports an experimental study on the recognition of the [±subjective] feature for verbal tenses by native speakers of English (the Simple Past) and French (the Passé Composé, Passé Simple and Imparfait), and for (grammatical) Aspect by native speakers of Serbian. When annotators deal with subjectivity and its triggering by verbal tenses and Aspect (that is, one of C. Smith's 2003 linguistic sources of subjectivity), it was found that they are not able to identify this feature using these cues. They have inter-annotator agreement rates close to those expected to occur by chance.

In particular, three English native speakers judged occurrences of the Simple Past with respect to the [±subjectivity] feature, and had an agreement rate corresponding to a mean К value of 0.0508 (corresponding to the mean of the К values for each pair of the three annotators). This К value shows that the annotators did not agree to an extent beyond what might be expected by chance. In the experiment on French, a total of 105 native speakers participated. The mean К value for the inter-annotator agreement rate between the five annotators was 0.29. All three verbal tenses analysed were judged as having subjective and non-subjective usages. The Imparfait was judged as subjective in 64% of cases, the Passé Composé in 33% of cases, and the Passé Simple in 56% of cases. Three Serbian annotators had a mean К value of 0.40. In the agreement data, the imperfective viewpoint was more frequently judged as subjective (76%) over non-subjective (24%), whereas the perfective viewpoint was more frequently judged as non-subjective (54%) over subjective (41%). These low К values for English and French verbal tenses indicate that the information about the speaker's perspective is not encoded by verbal tenses, and depends on the contextual assumptions that the hearer may formulate. As for Serbian, subjectivity seems easier to identify when grammatical aspect is expressed morphologically than when it is not. However, these three experiments show that subjectivity seems to be a heterogeneous phenomenon, which is interpreted at the global level, and which is not directly triggered by the categories of tense and aspect. Based on this evidence, my suggestion was that comprehenders identify subjectivity—defined as the speaker's viewpoint, psychological perspective, and perceptions—using a general pragmatic inference. In other words, no evidence for a procedural nature of the [±subjective] feature was found.

As shown in Sect. 1.1, the notion of *narrativity* has already been used in the literature by numerous scholars and, more importantly, in various frameworks. For example, Labov and Waletzky (1967) argued that two sentences which are interpreted as being temporally successive form a narrative text. In DRT, Kamp and Rohrer (1983) argued that certain verbal tenses, such as the French Passé Simple, impose a narrative (i.e. temporal progression) interpretation of the discourse where they occur. In SDRT, discourse segments can be linked by discourse relations, such as *narration*, which is the default coherence relation. Narration involves sentences where the textual order matches the temporal order of eventualities in the real world. Finally, Smith (2003) uses the notion of *narrative discourse mode*[8], defined accord-

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[8]The *narrative* discourse mode is a type of *temporal* discourse mode (besides report and description), in contrast to atemporal discourse modes (informative, argument-commentary). The

ing to aspectual criteria, in particular the type of eventualities expressed (events and states), and interpretation semantic principles. All these usages of the *narrativity* notion have in common the temporal progression interpretation of the discourse. However, they propose dissimilar explanations of how this interpretation is carried out. In this book, the *narrativity* notion only partly shares with other frameworks the idea of temporal progression interpretation. Instead, a different explanation of how hearers arrive at this interpretation is suggested. In this research, the [±narrativity] feature is meant to model both forward and backward temporal inferences triggered by verbal tenses, as well as simultaneous temporal relations. In other words, verbal tenses encode procedural information instructing the hearer to determine the feature's contextual value—i.e. positive or negative.

In Moeschler et al. (2012) and Grisot and Moeschler (2014), four arguments were given in favour of the procedural nature of this feature. Firstly, the [±narrativity] feature is information that constrains the inferential phase of constructing explicatures. Rather than contributing, it constrains the construction of the propositional content of the utterance (Wilson and Sperber 1998, Binnick 2009, Escandell-Vidal and Leonetti 2011). Secondly, temporal sequencing is a discourse property: it needs at least two eventualities for the [±narrativity] feature to be active. Procedural content provides information on how to manipulate conceptual representations, corresponding to more than one discourse entity. If a tense has a narrative usage, it means that as soon as its reference time is set, it is used to construct the temporal reference of the next event, and thus time advances. Binnick (2009) pointed out the role of verbal tenses in discourse coherence as temporal anaphors (discourse interpretation depends on the identification of their antecedents). In example (517), the Simple Past of the verb *take* (i.e. *took*) is bound by that of the verb *leave* (i.e. *left*). Time advances in a narrative sequence, because the R point of one eventuality is located just after the preceding one.

(517)   John left home early. He took the subway.

Thirdly, temporal sequencing can only be paraphrased with difficulty (as is true of conceptual representations for which synonyms can be more easily found), but it can be rendered explicit with the help of temporal connectives, such as *and, then, afterwards* or *because*. And fourthly, the [±narrativity] feature is information inaccessible to consciousness, resulting in low agreement rates among annotators.

The MCPM model is a *discursive* model: if the [±narrativity] feature is positive, then a procedure of temporal ordering calculus is initiated. A verbal tense has a narrative usage (i.e. there is temporal progression from one eventuality e_1 to another

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narrative mode makes use of two types of discourse entities: states and events. Smith (2003) and Dowty (1982, 1986) propose two principles that are involved in the interpretation of verbal tenses in the narrative mode. Firstly, if a sentence expresses a bounded event, the reference moment R increases from R_n to R_{n+1}, and the verbal tense expresses temporal progression. Secondly, if the eventuality expressed is not a bounded event (and is therefore a state), then R does not change, and the verbal tense is used anaphorically.

eventuality e_2, therefore $R_1 \rightarrow R_2$), as in (518), or a non-narrative usage (i.e. there is no temporal progression from one eventuality e_1 to another eventuality e_2, therefore e_2 has the same R_1), as in (519).

(518)   Erkshine *rose* from his seat, and going over to a tall inlaid cabinet,
        that stood between the two windows, unlocked it, and *came back*
        to where I was sitting, carrying a small panel picture set in an old
        and somewhat tarnished Elizabethan frame. (Literature Corpus)
(519)   It was enough for her that he *appeared* to be amiable, that he *loved*
        her daughter, and that Elinor *returned* the partiality. (Literature Corpus)

The identification of the reference time R is either linguistically triggered (by a verbal tense form or temporal adverb, for example) or pragmatically inferred by the hearer according to contextual and world knowledge. This procedure of temporal ordering calculus is not a default procedure, as Asher and Lascarides (2003) state, but it is triggered by the activation of the [±narrativity] procedural feature. Generally speaking, I would like to suggest that verbal tenses do not encode one of the two possible values of this feature by default, as is assumed by de Saussure (2003), for example. He suggested that the French Passé Simple encodes the narrative value by default, whereas the Imparfait is not specified to provide this instruction, which means that the [±narrativity] procedural feature is not applicable for the Imparfait. According to the model developed in this book, the category of Tense encodes this feature, and, as a consequence, all verbal tenses encode it: they trigger the procedure of contextually determining the narrative or non-narrative interpretation. Regarding speakers' usage, a verbal tense may be more frequently associated with one or another of the possible values without necessarily encoding it. For example, in literary texts, the Passé Simple is frequently used to express temporal progression. However, I argue that this information is not linguistically encoded by the Passé Simple. My suggestion is confirmed by the results of a self-paced reading experiment, in which participants read sequences of sentences expressing temporal progression, in which either the Passé Simple or the Passé Composé was used (Grisot and Blochowiak 2017; cf. Chap. 6). If the Passé Simple encoded temporal progression, where the Passé Composé was undetermined with respect to this feature, then we would expect to find a statistically significant difference between these two verbal tenses in terms of processing costs. The results of this experiment did not provide evidence favouring this hypothesis. In contrast, the results seem to support the suggestion made in this book, according to which the two possible values of the [±narrativity] procedural feature encoded by Tense are contextually determined.

The MCPM model is determined by the requirement to disambiguate usages of the English Simple Past and to improve its translation into French. Consider example (520), with an isolated Simple Past, and example (521), containing the target sentence and its cotext. With respect to its translation into a target language, the isolated token is ambiguous. In (521), the second sentence introduces another eventuality, and the two eventualities are temporally and causally related. According to the model, the English Simple Past has a narrative usage, and is translated into

French by a Passé Simple/Passé Composé, as in (522) and (523). In (524), on the other hand, the second sentence introduces an eventuality that takes place simultaneously. The R period of the first Simple Past occurrence includes the R moment of the second eventuality. According to the model, the Simple Past has a non-narrative usage, and is translated into French by an Imparfait, as in (525).

(520)   John *slept*.
(521)   John *slept*. He got rest.
(522)   Jean *a dormi*.   Il s'est reposé.
        John sleep.3SG.PC. He get rest.3SG.PC.
(523)   Jean *dormit*.   Il se reposa.
        John sleep.3SG.PS. He get rest.3SG.PS.
(524)   John slept. He had a dream.
(525)   Jean *dormait*.   Il fit un rêve.

John sleep.3SG.IMP. He have.3SG.PS a dream.

Further research was carried out in order to test empirically the theoretical assumptions suggested in Moeschler et al. (2012). In this book, Sects. 4.2.3–4.2.6 describe the experiments carried out for French, English, Italian and Romanian verbal tense. The experiments carried out on multilingual data confirm Grisot and Moeschler's (2014) model, and validate it for two additional Romance languages, Italian and Romanian.

Wilson and Sperber (1993) make the prediction that language users do not have conscious access to procedural information encoded by linguistic expressions. However, when the instructions themselves are rendered explicit, they help to guide the processing of the utterance. The offline experiments on the [±narrativity] feature supplied supplementary empirical evidence in favour of its procedural nature. Native speakers who were asked consciously to evaluate the temporal localization of eventualities with respect to one another showed difficulty in doing this task. Inter-annotator agreement rates ($К$ values of 0.41 for Italian, and 0.42 for English, French and Romanian) indicate that language users are able to identify this feature beyond the level of chance, albeit not to the extent of the higher agreement rates expected for information which is consciously accessed with ease. In other words, the [±narrativity] feature is identified in four languages with great difficulty when accessed consciously, but not when the encoded instruction is rendered explicit, by a connective for example. Experiment 3 indicated that the judges' agreement rate was improved ($К = 0.91$) when they were asked to insert a connective (such as *and* and *and then*) when possible, in order to make explicit the temporal sequencing interpretation of the excerpt they were judging.

Each of the languages considered exhibits its own language-specific behaviour for the [±narrativity] procedural feature. My hypothesis is that this is linked to the aoristicization process (Squartini and Bertinetto 2000) undergone by the compound past. That is to say, the compound past is subjected to a change from a pure perfect (as it remains in Spanish and Portuguese) to an aorist (the value of simple

past)[9]. The Romance languages considered in this research—French, Italian and Romanian—find themselves at a different point in the aoristicization process. In particular, the Romanian compound past is more advanced than the Italian compound past, which in turn is more advanced than the French compound past. The [±narrativity] feature is meant to capture the instruction to relate one eventuality temporally to another (i.e. temporal and causal sequencing vs. temporal simultaneity). The Imparfait most often exhibits non-narrative values in Romance languages.

In addition, an important variability was identified with respect to the usage of specific verbal tenses expressing past time, which can be discriminated according to the procedural information encoded by the category of Tense. In particular, the English Simple Past was translated into French by the Passé Composé (34%), Imparfait (23%) and Passé Simple (16%). Similar values were found for Italian (33%, 17% and 22% respectively) and Romanian (49%, 15% and 18%).

Corpus analysis showed that the compound past is more frequently used in Romanian than in Italian and French. Additionally, experimental work indicated that it is perceived and judged by native speakers to be narrative more often in Romanian than in Italian and French. As for the simple past, corpus analysis showed that its usage frequency decreases in the three languages considered, being used less frequently in Romanian than in Italian and French. Experimental work did not show significant differences in judgment between the three languages.

English presents a different pattern, mainly because the Present Perfect did not develop aorist functions, as the compound past in Romance languages did. In addition, the Simple Past has narrative and non-narrative usages with comparable percentages (60% narrative and 40% non-narrative, as shown in Sect. 4.2.7). The English Past Progressive form was not considered in the analysis, due to its infrequency in the corpus (only 1%, cf. Sect. 3.2.1).

These empirical findings show that the [±narrativity] procedural feature is a language-independent feature with language-specific behaviour. The results of the annotation experiments of the data used in this research are summarized in Table 5.2.

In other words, there is cross-linguistic variation between the individual verbal tenses which encode this instruction and its contextual values. My prediction is that, for example, a narrative usage of the Simple Past can be translated into a target language by a narrative usage of a verbal tense, be it simple past, compound past, imperfect (i.e. the so-called narrative imperfect) or even simple present (i.e. the historical present), as shown in examples (526)-(529), where the first is the original text in English, followed by its translations[10] into French, Italian and Romanian respectively. In these texts, the Simple Past form with a narrative usage is translated by a narrative imperfect in French, and a narrative simple past in Italian and Romanian.

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[9] In future work, the [±narrativity] feature should be tested for the Spanish and Portuguese simple past, compound past and imperfect. My prediction is that it will produce a very different pattern for the compound past. In particular, it might be judged as non-narrative more frequently than narrative, due to the fact that it does not undergo the aoristic drift of the compound past in French, Italian and Romanian.

[10] The examples come from parallel corpora (cf. section 3.4) consisting of texts translated by professional translators.

Table 5.2 The [±narrativity] feature and its cross-linguistic realization by each verbal tense considered

Language	Verbal tense	Narrative	Non-narrative
English	Simple Past	59%	41%
French	Passé Simple	**92%**	8%
	Passé Composé	**77%**	23%
	Imparfait	16%	**84%**
Italian	Passato Remoto	**96%**	4%
	Passto Prossimo	**88%**	12%
	Imperfetto	16%	**84%**
Romanian	Perfectul Simplu	**93%**	7%
	Perfectul Compus	**83%**	17%
	Imperfectul	19%	**81%**

(526) But when the Rabbit actually took a watch out of its waistcoat-pocket and looked at it and then hurried on, Alice started to her feet, […] and, burning with curiosity, she ran across the field after it and was just in time to see it pop down a large rabbit-hole, under the hedge. In another moment, down *went* Alice after it!

(527) Cependant, lorsque le Lapin tira bel et bien une montre de la poche de son gilet, regarda l'heure, et se mit à courir de plus belle, Alice se dressa d'un bond, […]. Dévorée de curiosité, elle traversa le champ en courant à sa poursuite, et eut la chance d'arriver juste à temps pour le voir s'enfoncer comme une flèche dans un large terrier placé sous la haie. Un instant plus tard, elle y *pénétrait* à son tour.

(528) Ma quando il Coniglio trasse un oriuolo dal taschino del panciotto, e vi affissò gli occhi, e scappò via, Alice saltò in piedi, […] e divorata dalla curiosità, traversò il campo correndogli appresso, e giunse proprio a tempo di vederlo slanciarsi in una spaziosa coniglera, di sotto alla siepe. In un altro istante, giù Alice *scivolò*.

(529) Dar când iepurele, imediat după asta, scoase din buzunarul veste un ceas, îl privi şi începu să se grăbească, Alice sări în picioare […] şi, arzând de curiozitate, o luă la fugă peste câmp după el chiar la timp pentru a-l putea vedea sărind într-o gaură de iepure mare de sub gardul viu. Într-o clipă Alice *sări* după el.

Other factors, such as Aspect and Aktionsart, influence the choice of the verbal tense in a target language, as in examples (530)-(533), where the first is the original text in English, followed by its translation into French, Italian and Romanian respectively, from the JRC corpus. Experimental work with respect to Aspect and Aktionsart showed that the perfective aspect and the bounded type of situations correlate significantly with the simple and compound past, whereas the imperfective aspect and the unbounded type of situations correlate with the imperfect.

(530)   The field experiment [...] It was accompanied by measurements at four
         fixed stations, with 15 mobile units, with an aircraft and balloons
         and *included* model calculations on the basis of a detailed emission inventory.
(531)   L'expérience sur le terrain [...] Elle a été accompagnée par des mesures
         dans quatre stations fixes et avec 15 unités mobiles, un avion et des
         ballons et *prévoyait* des calculs par modèle sur la base d'un inventaire
         détaillé des émissions.
(532)   L'esperimento sul campo [...] è stato accompagnato da misurazioni
         in quattro stazioni fisse, con l'ausilio di quindici unite mobili, un aereo
         e palloni aerostatici, e *ha incluso* calcoli di modello sulla base di un
         inventario dettagliato delle emissioni.
(533)   Experimentul de teren […] a fost însoţit de măsurători la patru staţii fixe,
         cu 15 unităţi mobile, cu un avion şi baloane şi *a inclus* calcule conform
         unui model bazat pe un inventar detaliat al emisiilor.

In (531), the French translator made use of the verb *prévoir* 'to foresee, to antici-
pate, to envisage', which is atelic and unbounded in this context, and chose the
Imparfait. In Italian and Romanian, the translators made use of the same verb, as in
English *to include*, which is telic and bounded in this context, and chose the com-
pound past. As far as the value of the [±narrativity] procedural feature is concerned,
in these texts the Simple Past and the verbal tenses used in the target language have
non-narrative value (i.e. the eventualities *accompany* and *include* are temporally
simultaneous). This value is manifested by the imperfect in French, and by the com-
pound past in Italian and Romanian.

5.3   Aktionsart and Aspect

In Sect. 1.1, I discussed the semantics of Aktionsart and Aspect, indicating that
Aspect expresses information about the way in which the eventuality is presented,
as perfective or imperfective, where Aktionsart expresses the inherent properties of
the eventuality type, dividing eventualities into states, activities, accomplishments
and achievements (Vendler 1957, 1967). These four aspectual classes can be
described in terms of ontological features as telicity, durativity and dynamicity. In
the literature, it has been argued that they are inherent properties of not the eventual-
ity but the verb phrase (i.e. the verb and its arguments).
   Previous research has pointed out the role played by these two categories in the
temporal interpretation of a discourse. As far as temporal sequencing is concerned,
aspectual theories (such as Dowty 1986) have suggested that it depends on the lexi-
cal aspect of the eventuality. However, there are numerous counterexamples that
weaken the aspectual hypothesis. Using a pragmatic framework, de Saussure (2003,
and previous research) argued that only Aspect and Tense play a role in determining
temporal reference and temporal sequencing, because they encode procedural

instructions constraining the interpretative process. In addition, he suggests that where there is a conflict between an atelic eventuality and a perfective verbal tense (in other words, between Aktionsart and Aspect), the hearer builds a bounded conceptual representation of that atelic eventuality.

The question that arises at this point of the discussion regards the nature of the information encoded by these two aspectual categories. Žegarac (1991) was the first to discuss the status of the information encoded by grammatical aspect within a relevance theoretic framework—that is, whether it is conceptual or procedural information. As far as Aktionsart is concerned, Žegarac (1991, 44) points out that Vendler's time schemata (i.e. states, activities, achievements and accomplishments) are assumed to be universal but realized differently in individual languages (see also Smith 1986). Aspect, unlike Aktionsart, is not related to inherent temporal properties of situation types, but expresses the speaker's viewpoint of the situation described.

Žegarac proposes a fine-grained analysis of both grammatical aspect (oppositions such as *simple* vs. *progressive* in English and *perfective* vs. *imperfective* in Slavic languages) and lexical aspect by looking at individual verbs in English and Serbian/Croatian. His contrastive analysis determines the following general conclusions: viewpoint aspect (i.e. Aspect) encodes procedural information constraining the explicit content of the utterance, whereas situation aspect (i.e. Aktionsart) represents conceptual information contained in the entries of verbs in the mental lexicon. With respect to the *simple* vs. *progressive* opposition in English, he suggests that the simple aspect is underdetermined for the sense of completion or entirety, which characterizes the perfective aspect in Slavic languages (p. 187). The sentences in (534) and (535), from Žegarac (1991, 187), provide evidence that the eventuality expressed by a Simple Past may continue up to present, and even beyond. They therefore indicate that the sense of completion with the Simple Past is not determined by its encoded aspectual information, but contextually.

(534)   John *ran* for several hours this morning, and, for all I know, he
          may still be running.
(535)   -How did Susan spend the morning? -She *worked* on Peter's paper
          all morning and she is still working on it.

The progressive on the other hand, encodes the instruction to instantiate (i.e. single event) the property denoted by a stative verbal predicate, as in (536), and to present the eventuality expressed as being incomplete, as in (537). Imperfective verbs in Serbian allow for two interpretations in English, corresponding to either the progressive or the simple past, as in example (538), from Žegarac (1991, 184–185).

(536)   He *is being* stupid to act like this.
(537)   He *was running* when the tram stopped.
(538)   *Radi.*
          Work.IMPERF
          'He/she works/is working.'

Imperfective verbs in Serbian retain the [-complete] feature in *when*-clauses, whereas aspectually unmarked verbs can have either a perfective or an imperfective interpretation, as illustrated by the contrast between (539) and (540) (Žegarac 1991, 185). The sentence in (539) is understood as conveying the idea that the discussion took place after the analyzing had finished, whereas the sentence in (540) conveys that the answering took place as the problem was talked about. He points out that the example in (540) strongly supports the view that the imperfective aspect grammaticalizes the feature [-complete].

(539)   Kad su *analizirali* problem, *raspravljali* su o mnogim pitanjima.
         When they analyze.UNSPECIFIED_ASP the problem, discuss.IMPERF
         a lot of questions.
(540)   Kad su *govorili* o tom problemu, *odgovarali* su na mnoga pitanja.
         When they discuss.IMPERF about the problem, they answer.IMPERF
         a lot of questions

As such, the aspectual categories of English and Serbian are comparable categories, which can be explained in terms of the grammaticalization of *completion* and *instantiation*. The progressive of English and the imperfective of Serbian grammaticalize the lack of completion—in other words, the instruction to build an unfinished (in the sense of lack of completion) representation of the eventuality. The perfective aspect in Serbian encodes completion, whereas the simple aspect in English is unspecified with respect to this feature. Furthermore, both the progressive and the perfective indicate indexically to a particular event instantiating the property denoted by the verbal predicate (i.e. Aktionsart), whereas the imperfective and the simple do not. Žegarac's cross-linguistic analysis illustrates that the procedural information encoded by Aspect is both language independent and exhibits language specificities.

Based on Žegarac's pioneering investigation of the pragmatics of grammatical Aspect, it is currently assumed in Relevance Theory that this category encodes procedural information constraining the interpretative process by imposing the speaker's viewpoint on the eventuality. To be more precise, the perfective aspect constrains the hearer to build a completed representation of the eventuality denoted by the verb—in other words, a single whole with highlighted boundaries. As noted above, Žegarac proposes that the perfective aspect indicates indexically to a particular event instantiating the property denoted by the verbal predicate. In (541), the Present Perfect conveys that the eventuality of having breakfast is completed, and makes reference to a particular instance of having breakfast, in principle at some relatively proximate time in the past. The analysis for (542) is similar, except that the eventuality took place at some time further in the past. The difference in meaning between the two utterances with respect to the period of time between E and S follows from the communicative principle of relevance.

(541)   I *have had* breakfast.
(542)   I *have been* to Tibet.

The imperfective aspect constrains the hearer such that he builds an unfinished representation of the eventuality—in other words, he focuses on the internal structure of the situation, or on a moment other than the initial or final boundaries. For example, in the sentence in (543), the progressive instructs the hearer to build an unfinished representation of the raining event, and makes reference to a particular event instantiating the property denoted by the verb. In contrast, the SP in (544) locates the eventuality of raining at some time in the past without making reference to a particular instance of raining (Žegarac 1991, 155).

(543)   It *was raining*.
(544)   It *rained*.

As such, Aspect encodes procedural information which constrains the explicit content of an utterance. Aspect imposes constraints on Aktionsart: these conceptual representations are viewed from the speaker's point of view as being completed or not. This idea is also advanced by Escandell-Vidal and Leonetti (2011, 92), who argued that Aspect encodes procedural information on how to construct the internal representation of the eventuality considered. They give the example of the progressive marker in English, which indicates that the event has to be viewed as an incomplete action in progress at a specific time. The category of Aspect presents the features proposed by Wilson and Sperber (1993) for procedural information: inaccessible to consciousness, and unavailable by way of conscious thought in languages when not expressed morphologically. In addition, these features are difficult to translate, as shown by the lack of one-to-one correspondence between English and Serbian, or English and French, for example.

The experimental work described in this section confirmed these theoretical assumptions. Two annotators were asked to evaluate Simple Past items with respect to perfective vs. imperfective viewpoint, and they agreed in 63% of cases, which corresponds to a К of 0.32. This К value is beyond chance, but nonetheless below the threshold of reliable data (around 0.6). This result shows the difficulty judges have in deciding on the type of viewpoint from which the eventuality was expressed; as a result, it points to the procedural nature of the [±perfectivity] feature. As far as the interpretation process is concerned, my suggestion is that hearers assign, by an inferential procedure, a contextual value of the [±perfectivity] feature, and this takes place at the level of the explicature. In other words, the [±perfectivity] feature represents procedural information constraining the formulation of the utterance's explicature. Due to the need for reliable annotated data with this feature when training an automatic classifier, another method was used in this research: the cross-linguistic transfer of properties based on translation corpora.

As for Aktionsart, Žegarac (1991, 222) suggested that the different behaviour of state verbs and event verbs may be captured by 'meaning postulates' or inference rules contained in the logical entries of the concepts denoted by these verbs. In other words, Aktionsart is of a conceptual nature, and *duration* (from the ontological feature of durativity) is a primitive. Similarly, Moeschler (2002a, b) suggested that lexical aspect encodes conceptual information, and gave several arguments to this

end. The first argument is linked to the fundamental assumptions of Relevance Theory. Relevance Theory is a representational theory stating that cognitive operations involve the manipulation of conceptual mental representations. These conceptual representations contain propositional content, i.e. information from nouns, verbs, adjectives, etc. On the other hand, functional categories encode procedural information on how to manipulate these conceptual representations. This initial parallel between lexical category/conceptual information and functional category/procedural information was refined according to empirical work, which supplied evidence against a one-to-one correspondence[11]. In addition, Moeschler et al. (2012) point out that Aktionsart has logical properties, and contributes to the propositional content of an utterance. Escandell-Vidal and Leonetti (2011, 92) suggest that durativity and dynamicity are formal linguistic traits involved in the description of situation classes in all natural languages.

In an utterance, the inherent temporal features of the eventuality combine with the instructions provided by Aspect. When they match—as in (545), where there is a dynamic telic situation and a progressive Aspect—the hearer builds a mental representation of a dynamic event in progress. In (546), in contrast, Aktionsart and Aspect do not match, as a progressive marker is applied to a stative predicate. The human brain processes these two types of information, and the hearer builds a mental representation of a dynamic situation in progress—i.e. John is behaving like a silly person in a particular situation. This phenomenon is known as *aspectual coercion* (Moens & Steedman 1988).

(545)   John is eating his sandwich.
(546)   John is being silly.

Another example is the imperfect in Romance languages. In Spanish, for example, as Escandell-Vidal and Leonetti (2011, 93) note, the imperfect encodes the instruction to view the eventuality as atelic or unbounded. Therefore, it combines most frequently with states and activities. When it combines with telic eventualities, there is an adjustment in the interpretation[12]. This can be expressed, for example, as a habitual or ingressive reading of the sentence. Escandell-Vidal and Leonetti's proposal for this phenomenon is that the procedural information encoded by Aspect is rigid and imposes a meaning adjustment on Aktionsart. This adjustment is inferential, and takes place at the level of the propositional explicature.

Based on these studies, Relevance Theory currently assumes that Aktionsart represents conceptual information that is subject to the constraints imposed by procedural information. Aktionsart has logical properties, and contributes to the propositional content of an utterance (Moeschler et al. 2012). Scholars have identified the distinctive ontological features of aspectual classes cross-linguistically,

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[11] For connectives, see Zufferey 2012; Blochowiak 2014a, 2015a and Moeschler 2015 for theoretical accounts. For verbal tenses, see Grisot and Moeschler 2014; Grisot 2015.

[12] This phenomenon is investigated in semantics as *coercion* (for example, de Swart 1998, 2003, 2011).

pointing to their language-independent character. In addition, Aktionsart presents the qualitative features proposed by Wilson and Sperber (1993) for conceptual information: speakers have easy access to lexical aspect, and can consciously reflect on it, as it represents easily graspable concepts (as shown in Sect. 4.3.2).

Again, the experimental work described in this section confirmed these theoretical assumptions. Two annotators were asked to evaluate Simple Past items with respect to one distinctive ontological feature of Aktionsart—that is, boundedness. Scholars have shown that Aktionsart is sensitive to both Tense and Aspect, and therefore it was operationalized as the [±boundedness] feature. Judges were asked to evaluate Simple Past items with respect to bounded vs. unbounded situations, and they agreed in 92% of cases, which corresponds to a $К$ of 0.84. The disagreements were resolved in a second round of the experiment. This $К$ value is beyond the chance value, and also beyond the threshold of reliable data. This result signals the ease which with judges decided on the type of eventuality using three linguistic tests. These results point to the conceptual nature of the [±boundedness] feature, which contributes to the explicatures of the utterance, and has truth-conditional value. As far as the interpretation process is concerned, the hearer assigns a contextual value of the [±boundedness] feature by way of an inferential procedure.

5.4 Revisiting Verbal Tenses According to the HD Model

Building on the procedural pragmatic approach of French verbal tenses (Moeschler et al. 1998; Moeschler 2000a, b, 2002b; de Saussure 2003), the HD model of temporal reference assumes that verbal tenses underdetermine the speaker's communicated content. The hearer must therefore inferentially recover the speaker's intended meaning with respect to temporal reference, which is defined broadly. However, the HD model moves away from previous accounts of verbal tenses in two regards. The first is the focus on the need to discriminate between the lexical and grammatical categories, commonly referred to by the generic notion of *verbal tense*, which are Tense, Aspect and Aktionsart. The second is the defence of a dualistic view of Tense: it encodes temporal information at the conceptual and procedural levels. The HD model predicts that Tense, Aspect and Aktionsart are parameters considered by the hearer during the interpretative process, and that the human mind tends to treat these parameters in a coherent manner.

Based on this model, several predictions can be made for individual verbal tenses in English, French, Italian and Romanian. They all share the following features, representing the common *tertium comparationis* required to enable their contrastive analysis:

- Their meaning is underdetermined and must be worked out contextually.
- They encode conceptual and procedural information, operationalized as the *past/non-past* distinction, which makes use of temporal coordinates E and S, and the [±narrativity] feature.

- They express the category of Aspect, operationalized as the [±perfectivity] feature.
- They apply to all types of eventualities, operationalized as the [±boundedness] feature.

The cross-linguistic investigation carried out in this book showed not only that these parameters are operationalized differently in each language, but also that they receive values which change from one context to another.

Traditionally, the French Passé Simple, Passé Composé and Imparfait are described as expressing reference to past time (for the Imparfait, only in its temporal interpretations). Numerous approaches aim to explain the difference between them, namely the classical, aspectual, anaphoric, textual and pragmatic approaches. Among the pragmatic approaches, procedural pragmatics—initiated by de Saussure (2000)—argued that these verbal tenses have descriptive and interpretative usages, the latter triggered by the combination of semantic and pragmatic temporal procedures with contextual assumptions. The Passé Simple, Passé Composé and Imparfait encode instructions that guide the interpretative process. The main assumption is therefore that verbal tenses are underdetermined, and that their meaning is determined inferentially according to the instructions encoded by Tense and Aspect for each of these tenses. Accounts of the Présent generally argue that it expresses reference to present time ($E = S$), as well as past time in its historical usage. This research accounts for the Présent from a theoretical point of view, principally with respect to its opposition to the Passé Composé, the Passé Simple and the Imparfait, established by the conceptual information $E = S$ vs. $E < S$.

5.4.1 Conceptual Information

The Passé Simple, Passé Composé and Imparfait encode conceptual information in the form of a pro-concept TIME, which can be operationalized as the localization of E with respect to S. These three verbal tenses share the same conceptual meaning, most frequently expressed as the ad-hoc concept $E < S$ (i.e. *pastness*). Like the English Simple Past, the hearer contextually builds an ad-hoc concept, which specifies the temporal localization of an eventuality with respect to S. All three coordinates, E, S and R, are variables saturated contextually according to linguistic and non-linguistic knowledge. R accounts for the instruction encoded by Tense to locate eventualities with respect to one another (i.e. the [± narrativity] feature).

The Passé Simple, Passé Composé and Imparfait share conceptual information not only monolingually but cross-linguistically (i.e. with the English Simple Past, as well as the simple past, compound past and imperfect in Italian and Romanian). The analysis of translation corpura described in Sect. 3.4 indicated that there is little cross-linguistic variation for the conceptual content of the English Simple Past—that is, reference to past time. In particular, past time tenses are used a target language in more than 72% of cases, while the Présent is used only in 5% of cases. At this level

of the content, the Passé Simple, Passé Composé and Imparfait are interchangeable. In actual usage, procedural information and computability with Aspect and Aktionsart provide supplementary information, and reduce the number and types of cases when the Passé Simple, Passé Composé and Imparfait are interchangeable.

The main assumption is that the Présent contrasts with the Passé Simple, Passé Composé and Imparfait with respect to their conceptual information. While the former tenses most frequently instantiate an ad hoc concept $E < S$, the Présent most frequently instantiates an ad hoc concept $E = S$. The results of the experiment from Sect. 4.2.2, which tested whether native speakers provide the correct verbal tense in a given context, indicated that there is no ambiguity for participants when providing a verbal form expressing reference to past or present time. This experiment provided evidence that the conceptual information encoded by verbal tenses—that is, past vs. non-past—is determined contextually, and that the agreement between the participants produced high κ values: 1 for artificial data, 0.80 for natural data, and 0.86 for all the data.

Considering that the meaning of a verbal tense is worked out in relation to its conceptual and procedural information, there are cases where the Présent is interchangeable with the Passé Simple, Passé Composé and Imparfait—i.e. in their narrative usage. This usage of the Présent is the *Présent Historique* 'historical present'. In this circumstance, the hearer uses contextual information to build an ad hoc concept $E < S$ for the Présent. At this point in the discussion, a question arises: what allows the shift from $E = S$ to $E < S$, and thus from Présent to Présent Historique? The literature has suggested that the shift is linked to the notion of *subjectivity* and Free Indirect Discourse (Benveniste 1966; Banfield 1982; Schlenker 2004; Moeschler 2014; cf. Reboul et al. 2016 for a critical investigation of these proposals). Moeschler (2014) argued that subjectivity is a pragmatic feature of natural language, and that the Présent Historique triggers two pragmatic effects: temporal sequencing [+narrative]; and subjectivity [+subjective][13]. As for its semantics, the Présent Historique may be described by a configuration of the Reichenbachian temporal coordinates E, R and S. There are two possibilities that permit reference to past time. The first is $E = R < S$, which also corresponds to the Passé Simple; the second is $E < R = S$, which also corresponds to the Passé Composé. Moeschler's suggestion is to dissociate the tripartite configuration into three pairs of relations: E&R; R&S; and the inferred relation E&S. For the Présent Historique, the situation is as follows (2014, 7):

> Dans le Présent Historique, si E est cotemporel à R (E = R), la seule contrainte de R est qu'il soit distinct de S (R ≠ S). […] Ce qui est encodé linguistiquement dans le Présent Historique est la relation entre E et R, à savoir E = R. La disjonction R ≠ S est inférée pragmatiquement sur la base des traits pragmatiques [±narratif] et [±subjectif].[14]

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[13] It is worth noting that, in Grisot (2017a), I provide experimental evidence that these two features are of a different nature: procedural for the former, and purely pragmatic for the latter.

[14] 'For the Présent Historique, if E is contemporaneous with R (E = R), the only constraint on R is that it must be different from S (R ≠ S). […] What is linguistically encoded in the Présent Historique is the relation between E and R, i.e. E = R. The disjunction R ≠ S is inferred pragmatically on the basis of the pragmatic features [±narrative] and [±subjective].' (my translation)

In other words, a context allowing narrative and subjective pragmatic features permits the shift from inferring E = S with the Présent to inferring E < S via R ≠ S with the Présent Historique. This description explains the lack of interchangeability between the Présent Historique and the other three French verbal tenses expressing reference to past time. Firstly, the Présent Historique is not interchangeable with the Passé Simple, with which it shares the [±narrativity] feature, because the Présent Historique is compatible with a subjective perspective. Secondly, the Présent Historique is not interchangeable with the Passé Composé, because it requires the disjunction R ≠ S. Finally, the Présent Historique is not interchangeable with the Imparfait, which has been described as a subjective verbal tense (as discussed in Sect. 1.1.2) because it combines [±narrativity] and [±subjectivity] features.

The suggestion I make in this book is that ad hoc concept of pastness (E < S) is contextually constructed according to cues like temporal adverbials and world knowledge. This ad hoc concept is complemented by the [±narrativity] feature, determining the localization of eventualities with respect to one another. The [±narrativity] feature represents procedural information encoded by Tense, validated experimentally with the Passé Simple, Passé Composé and Imparfait. Future research should investigate how the [±narrativity] feature behaves with the Présent and its usages, like the Présent Historique, among others.

5.4.2   Procedural Information

For the [±narrativity] feature, for example, the situation in English is quite different from that of the Romance languages, as shown in Table 5.3[15], reiterating Table 5.2 from Sect. 5.2.3. A Fisher's Exact Probability test shows that the difference between the English Simple Past and each of the verbal tenses used in a target language is statistically significant ($p < .05$). One of the reasons for this is that, in the Romance languages investigated, the compound past began the aoristicization process, whereas the English Present Perfect remained a perfect, with resultative and non-narrative usages. Consequently, it is only in the Romance languages that there is competition between the simple past and the compound past forms when operationalizing narrative contexts. In addition, the imperfect in Romance is not specialized for non-narrative usages, and only has a partial correspondence with the imperfective aspect. An accurate understanding of this requires an empirical and experimental comparison between the English progressive and the imperfect in Romance.

For the Romance languages above, these numbers indicate that Italian and Romanian are more advanced than French in the aoristicization process: 88% for the Italian Passato Prossimo and 83% for the Romanian Perfectul Compus, compared to 77% for the French Passé Composé. The difference between French and the other two Romance languages is shown to be statistically significant by a Fisher

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[15] The values written in bold signal the highest frequency associations between verbal tense and values of the narrativity feature.

Table 5.3 [±Narrativity] feature in English and Romance

Language	Verbal tense	Narrative	Non-narrative
English	Simple Past	59%	41%
French	Passé Simple	**92%**	8%
	Passé Composé	**77%**	23%
	Imparfait	16%	**84%**
Italian	Passato Remoto	**96%**	4%
	Passato Prossimo	**88%**	12%
	Imperfetto	16%	**84%**
Romanian	Perfectul Simplu	**93%**	7%
	Perfectul Compus	**83%**	17%
	Imperfectul	19%	**81%**

Exact Probability test ($p < .05$). The difference between Italian and Romanian is not statistically significant.

The procedural information encoded by the Passé Simple, Passé Composé and Imparfait is operationalized in this research as the [±narrativity] feature. Experiments from Sects. 4.2.3 and 4.2.4 investigated the behaviour of these three verbal tenses with respect to the [±narrativity] feature. The literature states that the Passé Simple and Passé Composé are more often used in narrative discourses, whereas the Imparfait is used in non-narrative discourses where it expresses background information. These observations received different types of explanations. One suggested explanation came from the procedural pragmatics framework (de Saussure 2003), according to which all verbal tenses encode uniquely procedural information. This framework makes a number of assumptions: by default, the Passé Simple encodes the instruction for temporal progression; the Imparfait instructs the hearer to build an unsaturated P variable within the event (which will be contextually saturated either as R or as a moment of consciousness C); and finally, the Passé Composé has a base value where it locates the eventuality prior to S ($E < S$), and two contextual values distinguished by the position of R (R = E in its *anteriority* usage, and R = S in its *resultative* usage).

According to the model put forward in this book, I suggest that the Passé Simple, Passé Composé and Imparfait encode procedural information, operationalized as the [±narrativity] feature—that is, they instruct the hearer to determine if the eventualities expressed are temporally related. A positive value for this feature indicates a narrative usage of the verbal tense in question, whereas a negative value for this feature indicates a non-narrative usage of the verbal tense. This hypothesis was tested in the experiment in Sect. 4.2.5. The results of this experiment showed that judges clearly recognized a primary narrative usage for the Passé Simple (92%), but did not make the same clear judgment for the Passé Composé (77%), nor for the expected non-narrative primary usage of the Imparfait (77.5%). This result opened the door to further finer-grained research: an annotation experiment on the Imparfait with the [±narrativity] feature, which was carried out in the experiment in Sect. 4.2.4. In this experiment, the Imparfait was categorized as non-narrative in 90% of cases, and as narrative in 10% of cases.

Table 5.4 [±Perfectivity] and [±Boundedness] in English and French

Language		Perfective	Imperfective	Bounded	Unbounded
English	Simple Past	46.9%	53.1%	48.3%	43.9%
French	Passé Simple/ Passé Composé	**33.1%**	8.3%	**47.8%**	34.9%
	Imparfait	11.2%	**44.8%**	10.8%	**41.4%**

5.4.3   Aspect and Aktionsart

The empirical work carried out in this research revealed differences between English and French[16]. With respect to the [±perfectivity] feature, the difference between English and French is statistically significant, both for the simple and compound past, and for the imperfect (with a Fisher Exact Probability test result of $p < .05$). As for the [±boundedness] feature, only the difference between the simple past and the imperfect is statistically significant (with a Fisher Exact Probability test result of $p < .05$). In this research, no experiments were carried out with aspectual information for Italian and Romanian verbal tenses (Table 5.4).

French scholars have assumed that the Passé Simple and Passé Composé are perfective (Martin 1971; Tahara 2000) whereas the Imparfait is imperfective (Martin 1971; Guillemin-Flescher 1981; Vetters 1996, among others), even if in some cases it can remain underdetermined with respect to Aspect. According to the model developed in this research, all verbal tenses in Romance and English provide information about Tense and Aspect as they are applied to Aktionsart. In other words, each verbal tense expresses temporal localization (i.e. Tense) and the speaker's viewpoint (i.e. Aspect) of eventualities (i.e. Aktionsart).

In this research, the relation between Tense and Aspect for French verbal tenses was not investigated directly. It is possible, however, to make some observations based on the results from Sect. 4.3.3, carried out on data randomly selected from a translation corpus. This experiment used Simple Past items, which were translated into Serbian, where Aspect is morphologically expressed. The results of this experiment showed that, in 78% of cases, the perfective viewpoints expressed with a Simple Past were translated by a Passé Composé or Passé Simple, and imperfective viewpoints expressed with a Simple Past were translated by an Imparfait. In 22% of cases, the reverse combination of features occurs: perfective viewpoints expressed with a Simple Past are translated by an Imparfait, and imperfective viewpoint expressed with a Simple Past are translated by a Passé Composé or Passé Simple.

From these results, I assume that each of these verbal tenses is not perfective or imperfective by default, as the literature suggests. According to the model suggested in this book, Tense combines with Aspect, and all four combinations are possible: *narrative perfective*, as in (547); *narrative imperfective*, as in (548), where the lexical paraphrase *être en train de* 'be+*ing*' explicitly expresses the imperfective viewpoint; *non-narrative perfective*, as in (549); and *non-narrative imperfective*, as in

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[16]The total values for each verbal tense should be considered per feature: [±perfectivity] and [±boundedness].

(550)[17]. There are, however, some combinations which are more frequent than others, and these are associated with one verbal tense or another. For instance, the narrative perfective combination is more frequently associated with the Passé Composé and the Passé Simple, whereas the non-narrative imperfective is more frequently associated with the Imparfait.

(547)   Il *toqua*   à la porte et   *entra*   dès qu'il y   *eut*
        une réponse.
        He knock.3SG.PS at the door and enter.3SG.PS as soon as it there
        have.3SG.PS an answer.
        'He knocked at the door and entered as soon as there was an answer.'
(548)   Dans son rêve, il *était en train de* chercher sa sœur. Ensuite
        il s'*arretait* et l'*appelait* de toutes ses forces.
        In his dream, he be.*ing*.3SG.look   his sister. Then,
        he stop.3SG.IMP and call.3SG.IMP with all his strength.
        'In his dream, he looked for his sister. Then he stopped
        and called her with all his strength.'
(549)   Marie *ferma*   les yeux et   s'*imagina* être une princesse.
        Mary close.3SG.PS her eyes and imagine.3SG.PS to be a princess
        'Mary closed her eyes and imagined she was a princess.'
(550)   Marie entra dans la chambre. Jean *était en train de* la chercher et il
        l'*appelait* par son prénom.
        Mary enter.PS the room. John be.3SG.*ing* look for her
        and he call.3SG.IMP by her name.
        'Mary entered the room. John was looking for her and was
        calling her name.'

Similar observations can be made with respect to the relation between Tense and Aktionsart. In this research, this relation was not investigated directly for French verbal tenses. The experiment from Sect. 4.3.2 targeted the usage of the Simple Past with telic and atelic situations, which were operationalized in terms of [±boundedness]. The cross-linguistic analysis of the results of this experiment indicated that, in 82% of cases, bounded eventualities expressed with a Simple Past are translated by a Passé Composé or a Passé Simple, and unbounded eventualities are translated by an Imparfait. In 18% of cases, Simple Past unbounded eventualities are translated by a Passé Composé or a Passé Simple, and Simple Past bounded eventualities are translated by an Imparfait. Consequently, the French Passé Composé and Passé Simple can express unbounded eventualities, as in (551), and the Imparfait can express bounded eventualities, as in (552). In other words, each verbal tense can be associated with either type of eventuality. Some correlations, however, are more frequent than others, such as bounded eventualities expressed with a Passé Composé or a Passé Simple, and unbounded eventualities expressed with an Imparfait.

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[17] The four combinations are easier to grasp in aspect-prominent languages, where Aspect is morphologically expressed. Additionally, the non-narrative interpretation of (549) and (550) is shown by the fact that *et* 'and' cannot be replaced by *et ensuite* 'and then', which would explicitly mark the temporal sequential interpretation.

(551)   Il *a* toujours *été* très poli.
        He be.PC always very polite
        'He has always been very polite.'
(552)   Il *atteignait* le sommet quand l'orage commença.
        He reach.IMP the top of the mountain when the storm begin.PS
        'He was reaching the top of the mountain when the storm began.'

These conclusions are inferred according to the analysis of translation corpora (from a tense-prominent language into an aspect-prominent language). The *cross-linguistic transfer of properties* method was used to transfer aspectual information from Serbian to the English Simple Past. Further experimental investigations on French data should be carried out to validate these conclusions, and to determine whether or not the Passé Composé, Passé Simple and Imparfait are associated by default with either of the values of the [±boundedness] feature.

In the light of these results, I would like to make a few suggestions. My first suggestion is that the [±narrativity] feature accounts for Harris' (1982) and Squartini and Bertinetto's (2000) hypothesis on the aoristicization process undergone by the compound past in Romance languages (except Portuguese and Spanish). Their suggestion is that the compound past undergoes a change from a true perfect towards an aorist, and that this scalar process is visible for the compound past in French, Italian and Romanian (see discussion in Sect. 1.1.3). My assumption is that the perfect aspect (such as the English Present Perfect and the compound past in Portuguese and Spanish) correlates with the non-narrative value of the [±narrativity] procedural feature, whereas the aorist (such as the simple past form in French, Italian and Romanian) correlates with the narrative value of this feature. If this were true, the Present Perfect and the Spanish compound past would be judged in an annotation experiment to have non-narrative usages more frequently than narratives ones. On the other hand, the French, Italian and Romanian compound past would have narrative usages more frequently than non-narratives ones.

The experiments on French, Italian and Romanian confirmed the scalar orientation of these languages in the aoristicization process. In particular, the Passé Composé was judged as narrative in an average of 71% of cases, the Passato Prossimo in 88% of cases, and the Perfectul Compus in 83% of cases. The difference between French and the other two Romance languages is statistically significant. However, the difference between Italian and Romanian is not statistically significant. These results raise two issues with respect to Squartini and Bertinetto's aoristicization scale. They suggest that Italian is not as advanced in the aoristicization process as French (i.e. standard French and standard Italian), underlining at the same time that there is a significant regional difference in Italian (north vs. centre vs. south). The results of experiments carried out in this research show that, in contrast to Squartini and Bertinetto's prediction, Italian is more advanced in this process than French. In other words, the Passato Prossimo is further along the path toward an aorist-like verbal tense than the Passé Composé is. This result might indicate that the Passato Prossimo continues to evolve in the aoristic drift in a man-

ner different from French. The Passato Prossimo was judged as narrative by speakers of Italian from the southern part of Italy in 86% of cases. Consequently, it is interpreted as having a perfective function (i.e. non-narrative) in only 14% of cases. Squartini and Bertinetto suggest that Italian and French precede Romanian on the aoristicization scale (cf. Sect. 1.1.3). According to their scale, a higher percentage of narrative usages is expected for the Perfectul Compus than for the Passé Composé and the Passato Prossimo. The results of experiments carried out in this research confirm the relation between French and Romanian. As for the relation between Italian and Romanian, the observed difference between the two languages is not statistically significant (83% in Romanian vs. 88% in Italian).

My second suggestion relates to the compound past and its description in the French literature, according to which it has a base value where it locates the eventuality prior to S (E < S), and two contextual values distinguished by the position of R (R = E in its *anteriority* usage, as in (553), and R = S in its *resultative* usage, as in (554)). I would argue that the base value corresponds to its conceptual content, which is shared with the simple and the compound past. The two pragmatic values reflect the contextual value given by the [±narrativity] procedural feature encoded by this verbal tense, a value inferred from contextual information.

(553)   Hier, j'*ai perdu* ma clef   et j'*ai dormi*   à l'hotel.
        Yesterday, lose.1SG.PC my key and I sleep.1SG.PC at the hotel
        'Yesterday, I lost my key and I slept at the hotel.'
(554)   *As*-tu *trouvé*   ta clef?
        Aux you find.2SG.PC your key?
        'Have you found your key?'

Thirdly, the French literature assumes that the Passé Simple encodes the instruction for temporal progression by default, and that this instruction is blocked if contextual information allows it to be. My suggestion is that the simple past encodes the instruction to determine a contextual value of the [±narrativity] procedural feature, but does not impose the narrative value. The results of the annotation experiment from Sect. 4.2.3 indicated that the Passé Simple was judged to have a narrative usage in 92% of cases, as in (555), and non-narrative in 8% of cases, as in (556).

(555)   Marie *étudia*   jour et nuit.   Elle *réussi* tous ses examens.
        Mary study.3SG.PS day and night. She pass.3SG.PS all her exams.
        'Mary studied day and night. She passed all her exams.'
(556)   Bianca *chanta* le recitative et   Ygor l'*accompagna* au piano.
        Bianca sing.3SG.PS the recitative and Ygor accompany.3SG.PC her
        on the piano
        'Bianca sang the recitative and Ygor accompanied her on the piano.'

As pointed out in Sect. 5.2.3, whether or not the Passé Simple encodes the narrative value of the [±narrativity] procedural feature by default must be addressed by experimental work on online processing. If tested in an online experiment with a

self-paced reading task, the predictions for the two possibilities—i.e. narrative by default vs. encoding the instruction to assign a contextual value to the [± narrativity] feature—are the following:

- If the Passé Simple encodes the narrative interpretation by default, then non-narrative interpretations should produce longer reading times.
- If the Passé Simple encodes the instruction to assign a contextual value to the [± narrativity] feature, then narrative and non-narrative interpretations should produce similar reading times.

In Grisot and Blochowiak (2017, Sect. 6.3), we used an online self-paced reading experiment to test the role played by the Passé Simple when processing a series of events that are to be interpreted sequentially—that is, temporal progression. This was compared to cases in which the Passé Composé was used. According to the procedural account of verbal tenses, the Passé Simple instructs the comprehender to order the events temporally, whereas the Passé Composé does not. The consequent prediction is that reading times for the segments in which the Passé Simple is used will be significantly shorter than those for the segments in which the Passé Composé is used. The results of the two experiments carried out (cf. Sects. 6.3.4 and 6.3.5) did not provide evidence of a significant difference in the meaning of these two verbal tenses with respect to temporal progression. In order to validate the [±narrativity] feature experimentally, further research should complement Grisot and Blochowiak's (2017) study by investigating the role played by these verbal tenses to express temporal regression, as well. Furthermore, in order to validate the cross-linguistic status of this feature experimentally, online processing experiments need to be carried out for simple and compound forms in a series of languages, such as other tense-prominent languages (Romance languages, English and other Germanic languages) and aspect-prominent languages (Slavic languages).

Fourthly, the literature assumes that the Imparfait encodes a null directional instruction, as in (557), where it expresses a situation holding before the situation introduced with the Passé Simple. Under pressure from contextual information, the null directional instruction can be changed into an instruction for temporal ordering, especially for the narrative Imparfait, as in (558) (see for example de Saussure (2003), as discussed in Sect. 1.1.2). In (558), the adverbial *une seconde plus tard* provides the Imparfait with the reference point required, and the Imparfait allows temporal sequencing.

(557)   Paul *entra* dans le bar.   Marie *buvait* un café.
        Paul enter.3SG.PS in the bar. Mary drink.3SGIMP a coffee
        'Paul entered the bar. Mary was drinking a coffee.'
(558)   Paul *entra* dans le bar.   Une seconde plus tard, Marie *partait*.
        Paul enter.3SG.PS in the bar. One second later, Mary leave.3SG.IMP
        'Paul entered the bar. One second later, Mary left.'

I suggest that, as with the Passé Simple, the Imparfait does not encode a null directional instruction by default. On the contrary, it encodes the instruction to determine a

contextual value of the [±narrativity] procedural feature. This theoretical position will
be verified experimentally in future work. My prediction would be that narrative and
non-narrative usages of the Imparfait will result in similar reading times.

Finally, my proposition is that the simple past, compound past and imperfect are
interchangeable only when they share—besides conceptual information—proce-
dural information. For example, the Passé Simple, Passé Composé and Imparfait are
interchangeable in their narrative usages, not only in French but also cross-
linguistically, as shown below. Example (559) is the original text written in English,
where a Simple Past form is used; example (560) is its translation into French,
where a narrative Imparfait is used; example (561) is its translation into Italian,
where a narrative Passato Remoto is used; and finally, example (562) is its transla-
tion into Romanian, where a narrative Perfectul Simplu is used. The narrative
Imparfait used in (560) could be replaced with a narrative Passé Simple, as in (563),
or a narrative Passé Composé, as in (564).

(559)   But when the Rabbit actually took a watch out of its waistcoat-pocket
        and looked at it and then hurried on, Alice started to her feet, […] and,
        burning with curiosity, she ran across the field after it and was just in time
        to see it pop down a large rabbit-hole, under the hedge. In another moment,
        down *went* Alice after it!

(560)   Cependant, lorsque le Lapin tira bel et bien une montre de la poche de son
        gilet, regarda l'heure, et se mit à courir de plus belle, Alice se dressa d'un
        bond, […]. Dévorée de curiosité, elle traversa le champ en courant à sa
        poursuite, et eut la chance d'arriver juste à temps pour le voir s'enfoncer
        comme une flèche dans un large terrier placé sous la haie. Un instant plus
        tard, elle y *pénétrait* à son tour.

(561)   Ma quando il Coniglio trasse un oriuolo dal taschino del panciotto, e vi
        affissò gli occhi, e scappò via, Alice saltò in piedi, […] e divorata dalla
        curiosità, traversò il campo correndogli appresso, e giunse proprio a tempo
         di vederlo slanciarsi in una spaziosa conigliera, di sotto alla siepe. In un
        altro istante, giù Alice *scivolò.*

(562)   Dar când iepurele, imediat după asta, scoase din buzunarul veste un ceas,
        îl privi şi începu să se grăbească, Alice sări în picioare […] şi, arzând de
        curiozitate, o luă la fugă peste câmp după el chiar la timp pentru a-l putea
        vedea sărind într-o gaură de iepure mare de sub gardul viu. Într-o clipă Alice
        sări după el.

(563)   Un instant plus tard, elle y *pénétra* à son tour.

(564)   Un instant plus tard, elle y *a pénétré* à son tour.

However, according to Grisot & Moeschler's model (2014), one would argue that
only the narrative Imparfait provides a subjective perspective of the eventuality
expressed. This brings into discussion the notion of subjectivity, which was
accounted for experimentally in Grisot (2017c). In this paper, I show that native
speakers of French have difficulties consciously accessing the [±subjectivity] fea-
ture. The agreement rate goes no higher than a ϗ value of 0.3. This value remains

constant, whether two or more judges participate in the experiment. When the agreements are analysed, they indicate that French verbal tenses expressing past time are not specialized for one of the two values of the [±subjectivity] feature. Nonetheless, the Imparfait and Passé Simple are preferred when expressing the speaker's subjective perspective (64% subjective and 36% non-subjective usages for the Imparfait, and 56% subjective and 44% non-subjective usages for the Passé Simple), whereas the Passé Composé is preferred when describing a situation in a non-subjective manner (67% subjective and 33% non-subjective usages). These results do not provide evidence of a systematic subjective interpretation for the French Imparfait.

5.5   Summary

This chapter has given an account of the model of temporal reference, determined according to the cohesion ties investigated in this research. I have suggested that the global interpretation of temporal reference at the discursive level is determined by the linguistic means existent in a language on the one hand, and by their ad-hoc inferential contextual saturation on the other. In tensed languages, like English, French, Italian and Romanian, temporal reference is expressed linguistically by Tense, Aspect, Aktionsart, modality (TAM markers), temporal connectives and temporal adverbials. Linguistic expressions in general, including TAM markers, underdetermine the content communicated by a speaker, both at the level of explicature and implicatures. In the interpretation process, their meaning is worked out contextually.

In addition, a reanalysis of Tense, Aspect and Aktionsart was proposed in the light of the empirical work carried out in this research. Firstly, I proposed a mixed conceptual-procedural nature of Tense. As such, I argued that Tense encodes both conceptual and procedural information. Tense encodes a pro-concept TIME, which is semantically incomplete, inferentially worked out, and contributes to the truth-conditions of an utterance. I suggested that hearers build an ad hoc concept of pastness ($E < S$) or non-pastness ($E \geq S$), which are neuro-linguistically valid categories, according to contextual information. Tense encodes the instruction to relate eventualities temporally with respect to one another, operationalized as the [±narrativity] feature. It was argued that a verbal tense does not encode one of the values of the [±narrativity] feature by default, but instead represents a contextual value determined equally according to other parameters, such as Aspect and Aktionsart.

Furthermore, it was argued the grammatical category of Aspect represents procedural information constraining the formulation of hypotheses about the explicit content of an utterance. The [±perfectivity] feature operationalizes the speaker's viewpoint of the eventuality expressed. Verbal tenses do not correlate with one of the two possible values of the [±perfectivity] feature by default. Additionally, the category of Aktionsart represents conceptual information contributing to the truth-conditions of an utterance. This information was operationalized as the [±boundedness] feature, which represents the actual realization of an eventuality.

   I pointed out the lack of a common framework which would allow a consistent contrastive comparison of verbal tenses. I proposed a cross-linguistically valid framework that would be both theoretically and empirically grounded. The features included in the model developed in this book originate in the specialized literature on the English, French, Italian and Romanian verbal systems, as well as the inflectional categories that verbs take in tensed languages. These features were validated experimentally, and the model was developed according to translation corpora, using methods such as the cross-linguistic transfer of properties. It was assumed that the English simple past in English, the Italian, French and Romanian simple and compound past and the imperfect in share conceptual meaning, as well as the instruction to relate eventualities temporally with respect to one another. This procedural information is a cross-linguistically valid feature, which the languages under consideration materialize in dissimilar ways. Using Squartini and Bertinetto's hypothesis about the aoristicization process, it was argued that there is a positive correlation between the degree of advancement of the compound past in the aoristic drift and the frequency of its narrative usages. A series of suggestions discussed in this chapter were tested and validated in the empirical work carried out in this research.

   In Chap. 6, I will develop the proposal that temporal cohesion, determined at the discursive level, indicates the cognitive temporal coherence that comprehenders establish at the level of the mental representations of situations. As such, the human brain tends to treat temporal information from different sources (Tense, Aspect, Aktionsart, temporal connectives and temporal adverbials) in a coherent manner.