The aspectual contribution of tenses and the semantics/pragmatics interface

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1 Introduction: leading hypothesis & goal of the investigation

The core objective of the present paper is to shed light on the nature and interaction of semantic and pragmatic mechanisms underlying the interpretation of tenses within a discursive context. Is this about semantic underspecification? Semantic and/or pragmatic entailments? implicatures? discourse reasoning? The inventory of the actual culprits will turn out to be varied and complex. But I will try and show that much should be traced back to the fact that tenses are endowed with an illocutionary force-related content – or at least some sort of function reflecting the speaker’s communicative goals.

To achieve this goal, I will propose an SDRT account1 of the function of tenses as discourse-structuring items. At least since Weinrich (1964), it is almost common wisdom that tenses are a key factor with respect to discourse structure (see also Smith (2003) for recent developments on the impact of aspect on 'modes of discourse'). The idea that the aspectual contribution of tenses helps determining the overall structure of discourse (of which temporal ordering is a mere ingredient) has been steadily gaining ground in the literature since the early 1990's – a development in which the SDRT framework has played a pioneering role, cf. e.g. Asher & Lascarides (1993).

The approach I adopt here will be based on a methodology in which both morpho-syntactic distributionnal factors and discursive distributional factors play a key role. Indeed, I will make extensive use of two types of diagnostics to reveal the interpretative contribution of tenses2:

(i) the distribution of tenses with morpho-syntactic units in general, but more particularly with so-called aspectuo-temporal modifiers (e.g., for phrases, past temporal expressions…); this corresponds to the compositional semantics of tenses, since semantics and morpho-syntax govern each other;
(ii) the way tenses can or cannot licence certain types of discourse relations (or rhetorical relations), in the sense of Asher & Lascarides (1993), and more generally the way they interact with contextual/discursive parameters; this corresponds to the contribution of tenses at the semantics/pragmatics interface, and reflects a second (but not minor in my view) layer of linguistic convention.

A large portion of the literature3 about tenses either solely focuses on compositional semantic issues (and therefore, on tests (i), cf. e.g. Verkuyl (2000), Pancheva (2004), Pancheva & Stechow (2004) – the latter

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1 The present paper represents much very an attempt at synthesizing the results of a long-standing project which has involved three other colleagues, namely Laurent Roussarie, Carl Vettes and Gerhard Schaden. But of course, errors or misconceptions remain entirely mine.
2 See Dahl (2000) for a typological application of the very same sort of approach.
3 In sharp contrast with these works, I would like to sustain the claim that it is impossible to split aspectual interpretation in two perfectly distinct and autonomous layers, as advocated in a number of prominent works. For instance, Verkuyl (1993, 2000) proposes to represent aspect in terms of intervals at the compositional semantic level (very much in the spirit of the so-called 'interval semantics'), while being happy to view it in a neo-davidsonian way at the discourse level (i.e., as involving reified events). I believe that there are two (related) reasons why we should not adhere to such a view. First, many of the interpretative effects associated with tenses show up at the semantics/pragmatics interface; while these effects sometimes seem to depart from the compositional semantics of tenses, they are in fact always built from them (see e.g. the case of the so-called 'narrative imparfait'; Caudal & Vetters, 2003). And second, aspectually underspecified expressions (regardless of whether they involve
reference being overtly typological), and/or excludes rhetorical functions and generally discourse structure from the theoretical picture (see e.g., Portner, 2003).

The hypothesis providing the theoretical backbone of the present paper is the following: tenses are endowed with some form of illocutionary content, which plays a fundamental role at the semantics/pragmatics interface, and is somehow related to their aspectuo-temporal contribution. This fact is reflected by their being associated with a particular subset of discourse relations, and even sometimes implicature-like entailments which in turn can trigger certain specific interpretative effects (possibly causing/enabling additional discourse relations to be established).

Capitalizing on a series of papers dedicated to the study of tenses at the semantics/pragmatics interface across a handful of Romance and Germanic languages (i.e., French, English and Allemanic; cf. Caudal & Roussarie (2005, 2006), Caudal & Schaden (2005a,b), Caudal & Vettets (2003, 2005, 2007), etc.), I intend to sketch here a tentative classification of the aspectuo-temporal contribution of tenses at the semantics/pragmatics interface, and to propose distinct formal options to account for them within the SDRT framework – in short, I will put forth some sort of formal 'toolbox' for the treatment of tense and aspect, with cross-linguistic and historical purposes. This proposal is in line with the grammaticalization hypothesis (see e.g., Bybee et al. (2004), or Dahl (2000)) insofar as it draws on regular cross-linguistic and historical patterns about the semantics and pragmatics of tenses.

1.1 Classifying tenses w.r.t. their impact on the semantics/pragmatics interface

The two most obvious issues with respect to relationship between the aspectual contribution of tenses and the semantics/pragmatics interface are the following:

(i) does the semantics/pragmatics interface contribute to narrowing down the interpretation of an aspectually underspecified tense? (e.g., a preterit);

(ii) does the semantics/pragmatics interface play a role in achieving additional interpretational effects for aspectually non-underspecified tenses? (e.g., the French imparfait)

(i) is thus about interpretative reduction (the interface needs to lift some aspectual ambiguity), whereas (ii) is about interpretative expansion (the interface needs to derive richer interpretative effects from the combination of the (compositional) semantic meaning and certain contextual factors).

Two additional issues will be taken into consideration: tenses whose semantics, without being semantically underspecified, either possess:

(iii) a very specific aspectual semantics (cf., e.g., the French passé simple), or

(iv) a broad (but not shallow) aspectual semantics (cf., e.g., the French passé composé).

The two latter types of tenses behave very differently with respect to the semantics/pragmatics interface, as we will see. For diachronic and typological reasons, each of the above configurations tends to cover an aspectual class of tenses across Germanic and Romance languages. Thus, aspectually underspecified tenses are mostly preterits, while aspectually broad tenses tend to be perfects having partly evolved into aorists (cf. e.g., the German Perfekt or the French passé composé).

1.2 Tenses as illocutionary force indicators (IFIs)

Following Caudal & Roussarie's (2005) central hypothesis, I consider tenses as illocutionary force indicators (IFIs), in the sense of Bierwisch (1980). This proposal can be summarized as follows: the different kinds
of aspectual classes of tenses⁴ are typically used within certain kinds of communicative strategies (see for instance the classical distinction between 'narration' and 'comment' tenses in Weinrich, 1964), and typically not used with some others. Indeed, tenses tend to allow / trigger certain kinds of speech acts and rhetorical relations while blocking some others. Indeed tenses seem to have a fairly large number of illocutionary-force related effects, and more generally to have an impact on communication through discourse structure. Thus, tenses do not equally allow for hypotheticals: it is a cross-linguistic fact that tenses associated with so-called imperfective viewpoints can be used with counterfactual or conditional readings (cf. the French imparfait in (1)), while aorist tenses such as the French passé simple cannot (cf. (2), and Caudal, Vetters & Roussarie, 2003). Similarly, not every tense is compatible with a jussive force; perfective viewpoint tenses clearly disallow them, contrary to imperfective viewpoint tenses, cf. (3a/b/c):

(1) Ah si j'étais / j'avais été riche…! (optative: counterfactual/hypothetical)
Ah if I be-IMPF / have-IMPF been rich!
'I wish I were rich! / If I were rich…'

(2) *Ah si je fus / eus été riche !
Ah if I be-PS / have-PS been rich!

(3) a. Maintenant, je/tu pars (deontic/volitional reading OK)
Now, I/you go-PRES. 1/2ps. ‘Off I/you go, now.’ "I/You must go now."

b. Jean dit à Marie que maintenant, il / elle partait. (deontic/volitional reading OK)
John say-PS-3sg to Mary, that now he / she go-IMPF.3sg.

(4) Jag har tydligen varit sjuk veekan 27.
I have probably been sick week-the 27.
‘I was probably sick on week 27’

In addition to these facts, it has been noted for some time already that tense/aspect and evidentiality are cross-linguistically related categories (cf. Guentchéva, 1996, Aikhenvald 2004).⁵ Thus, Rothstein (2005) showed that so-called reportive or inferential contexts have a drastic impact on the Swedish perfekt. They make this tense capable of combining with past temporal modifiers (which are normally ruled out), cf. (4):

(5) D’après Yannig, Mona serait à Vannes aujourd’hui. Mais à mon avis, c’est faux.
‘According to Yannig, Mona is in Vannes today. But I don’t think that’s true.’

And to take one last example, the Bulgarian perfect can express inference from results (Pancheva, 2005):

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⁴ I take tenses to contribute aspectual viewpoints (in the sense of Smith 1991), thereby expressing the speaker's perspective on the development of an event. This, in turn, can affect the speaker's communicative perspective, as we will see.

⁵ This relation can be observed both diachronically and synchronically. For instance, on the diachronic side, so-called 'reported evidentials' are derived from perfects, or considered as extensions of them in many languages (e.g. some Iranian or Balkanic languages, cf. Aikhenvald 2004:77); see also the case of the evidential readings of the Swedish perfect, Rothstein, 2005). On the synchronic side, in a number of languages possessing complete / independent evidential paradigms, certain tense-aspect markers are nevertheless incompatible with them (or with evidential readings of non-purely evidential markers), notably those expressing the future (cf. Aikhenvald 2004:263). Vice versa, evidentials or evidential readings of certain markers are frequently restricted to certain temporal and/or aspectual markers. For instance, in the languages of the Balkans, evidentiality is restricted to the past, while in Tibetan, the 'first-hand' evidentiality system (e.g., a 'truly' evidential system) is restricted to the perfective; etc. See Aikhenvald (2004:263-267) for a discussion and other cases illustrating the tense/aspect – evidentiality connection.
(6) Vcera v Sofia (e) valjalo (Pancheva 2005)
Yesterday in Sofia-PRES rain-PERFECT
‘Yesterday it rained in Sofia’ (Speaker has heard/guessed that it is the case that…)

Now since evidentials have been demonstrated to be frequently IFIs (see, Faller, 2006a,b), this connection brings additional support to the idea that tenses are IFIs too.

Last but not least, the idea that tenses are endowed with some kind of illocutionary content fits well with the viewpoint approach to aspect (cf. Smith, 1991) – the very approach defended here: aspectual viewpoints must be illocutionary devices because they express the speaker’s stance towards an eventuality she wants to refer to (in comparison, aspect-shift operators embodied by ordinary aspectual verbs or semi-auxiliaries operate within the realm of propositional contents, and cannot therefore have any connection with illocutionary contents). To account for this obvious connection, I define *illocutionary viewpoints* (IVPs) as the semantico-pragmatic content of a tense, cutting across the domains of time, modality, and aspect (in this sense, IVPs are associated – but not equated – with aspectual viewpoints; cf. Caudal & Roussarie, 2005).

In SDRT terms, IVPs reflect how tenses make aspectual propositional contents (i.e., stages) available for the establishment of discourse relations in the Logic of information Packaging. That is, IVPs characterize the rhetorical function of tenses at the semantics/pragmatics interface (and therefore, their illocutionary function as well, if we adopt Asher & Lascarides’ (2001) notion of rhetorical relations as (relational) speech act types).

### 1.3 Tenses, IVPs and discourse relations

Following Caudal & Roussarie (2004, 2005), I consider that the main sources of interaction between tenses and the semantics/pragmatics interface are (i) discourse relations and (ii) the kind of entailments which are somehow conventionally associated with tenses (and which partly govern their connection with discourse relations). In fact, both modes of interaction eventually boil down to the illocutionary force function of tenses, at least if we take seriously Asher & Lascarides' (2003) claim that discourse relations should be viewed as relational speech act types.

### 2 Classifying the aspectual contribution of tenses: cross linguistic and historical considerations

I will review here different historical and typological configurations for the aspectual content of tenses. The main points I will be trying to make are that (i) there are regular patterns in the way tenses evolve, aspectually speaking (in line with the grammaticalization hypothesis of e.g. Bybee et al. (1994) and Dahl (2000)) and (ii) these evolutions involve not only the semantic content of tenses but also the semantics/pragmatics interface, and result in complex, mixed aspectual contents, partaking of several canonical aspectual categories of tenses.

I will suppose that there are three broad semantic classes of aspectual viewpoints:

- Imperfective viewpoints: they are used to focus on some internal part of an eventuality (cf. e.g., the English present progressive);
- Perfective viewpoints: they are used to focus (at least) on the entire 'core' of an eventuality, and require it to involve a change-of-state (cf. e.g., the French *passé simple*);
- Resultative viewpoints: they are used to focus on the result state holding after an eventuality (cf, e.g., the English *present perfect*).
These three broad classes of viewpoints are commonly grammaticized as three cross-linguistically identified types of tenses, namely:

- so-called imperfects, associated with imperfective viewpoints (7);
- so-called aorists, associated with perfective viewpoints (8);
- so-called perfects, associated with resultative viewpoints (9).

(7) Yannig mangeait une crêpe.
Yannig eat-IMPF.3.sg. a pancake
'Yannig was eating a pancake.'

(8) Yannig mangea une crêpe.
Yannig eat-PS.3.sg. a pancake
'Yannig ate a pancake.'

(9) Yannig a mangé une crêpe (maintenant).
Yannig have-3.PRES.sg. eaten a pancake (now)
'Yannig has eaten a pancake (now').' 

I define resultative viewpoints as the aspectual contribution of canonical perfects – e.g., the English present perfect – which express a resultative meaning; sentences in the present perfect describe a result or consequent state (in the sense of Parsons, 1990).

The requirement for a change-of-state imposed by perfective viewpoints on the associated eventualities has been described and analyzed in many ways. Empirically, it corresponds to an aspectual alternation-like effect: normally atelic sentences are caused to express a change-of-state, cf. (10)-(11).

(10) Yannig fut malade.
Yannig be-PS.3.sg. sick.
'Yannig became sick'

(11) Yannig courut.
Yannig run-PS.3.sg.
'Yannig ran off/started running'.

This effect has been captured and explained in a number of different ways, but mostly in terms of aspect-shift/coercion (cf. e.g., Smith 1991, de Swart 1998). I will also propose an aspect-shift based account of such phenomena, albeit in a somewhat different manner, as I will made clear.

Only four grammaticization/historical patterns will be reviewed here (although many others are possible, of course), namely:

- Perfects having pragmatically evolved into aorists;
- Perfects having semantically evolved into/towards aorists;
- Perfects having semantically evolved into/towards preterits;
- Imperfects having pragmatically evolved into/towards preterits.

Diachronically speaking, it is well known that perfects tend to evolve into aorists (cf. Bybee et al. (1994), Nedjalkov et al. (1988), etc.). There are also well-known instances of perfects having evolved into preterits, and then back into aorists (this is for instance the case of the French passé simple: initially derived from the Latin perfectum, it evolved into a preterit in Old French before turning into an aorist in Middle French – see Mellet, 2000). Perfects can also drift along the so-called ‘perfect continuum’ (cf.

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6 The French passé composé is actually not an instance of canonical perfect / resultative viewpoint tense; it is in fact an aspectually composite tense, a crossbreed between a resultative and a perfective viewpoint tense. I introduced it here for the sake of constituting a paradigm of examples.
Nedjalkov 1988) and evolve towards preterits rather than aorists (that is, towards more aspectually underspecified tenses). Note that imperfects too can evolve towards preterits, but the respective aspectual contributions of these two types of tenses can then be fairly different, as we will see.

Taking this diachronic dimension into account is crucial, for it sheds light on the mixed aspectual semantics and/or pragmatics of tenses, and helps accounting for them formally. To put it short, there are three interesting semantics/pragmatics configurations: (i) some tenses have acquired an underspecified aspectual semantics (e.g., preterits), in which case the pragmatics needs to narrow down (precisify) their meaning; (ii) some other tenses are semantically fully specified, but have evolved towards new uses, somewhat at odds with their synchronic semantics, in which case the pragmatics needs to expand the available semantics so as to achieve the interpretations at stake; and (iii) a last class of tenses have broadened their semantic meaning so as to encompass a larger part of the spectrum of aspectual contributions without becoming underspecified, as in the case of the French passé composé, which has in fact acquired a double aspectual and temporal semantics.

2.1 Aspectual classes of tenses: semantic and pragmatic signatures

Of course, tenses are usually not straightforward instances of the theoretical aspectual viewpoint categories. Most tenses are endowed with a non-canonical (or mixed) aspectual semantics, which partakes only partially from (at least) one of these classes. Thus, so-called preterits possess an underspecified semantics yielding in some contexts a perfective viewpoint like interpretation, and in some others an imperfective viewpoint-like interpretation – in that respect, they are some sort of underspecified semantic crossbreed between imperfects and aorists.

On top of semantic underspecification, pragmatic extension can also cause many tenses to yield a fairly large number of (often apparently unrelated) interpretations. This is for instance the case of the French imparfait, which is well known for its interpretative versatility, encompassing contextual uses which are considered to be at odds with its aspectual meaning (and its traditional classification as an 'imperfect'). A similar (and even greater) difficulty arises with the German Perfekt, which admits uses we can classify as 'perfective viewpoint' like, 'imperfective viewpoint' like, or 'resultative viewpoint' like.

I will now move to the study of the 'discourse signatures' of classes of aspectual viewpoints – that is, the kind of rhetorical alternatives (possible vs. impossible) which are typical of their uses in context. I'll review here pairs of discourse relations which typically alternate in discourse (and clearly put rather divergent or even conflicting semantic demands on the speech act terms they connect). I will also mention some specific (non discursive) semantic facts distinguishing them with respect to a propositional content level, compositional semantics. The three main classes of aspectual viewpoints I have distinguished above will be arrayed in two oppositive systems: the imperfective/perfective system and the perfective/resultative system.

2.1.1 The imperfective / perfective viewpoint distinction (I): morpho-syntactic tests

Perfective and imperfective viewpoints are known to be often associated with specific classes of aspectuo-temporal modifiers, or at least to ascribe them different interpretations. This is for instance the case with for-phrases in English, which can easily receive a felicitous (iterative or other) temporal interpretation with the simple past, whereas they either reject the past progressive (cf. (12a/b)) or take on a modal meaning with this tense. See also the equivalent pendant and depuis phrases in French, which easily combine with the passé simple but can be problematic with the imparfait (cf. (13) and (14))– unless they appear within a somewhat extended narrative context, as shown in Caudal & Vetters (2003, 2005).

(12) a. John waited for a while.
    b. #John was waiting for a while.

(13) a. Yannig marcha pendant longtemps.
    b. #Yannig marchait pendant longtemps. (bizarre when uttered out of the blue)
'Yannig walk-PS(a)/IMPF(b) for a long time'

(14) a. *Yannig marcha depuis midi.
    b. Yannig marchait depuis midi.
    'Yannig walk-PS(a)/IMPF(b) since noon'.

This has led some authors to characterize certain aspectu-temporal modifiers as tests for aspectual viewpoints (see e.g., Smith 1991, Vettets 1996).

2.1.2 The imperfective / perfective viewpoint distinction (II): Background vs. Narration
But more importantly, certain classes of tenses are also known to easily cause alternations between the Background and Narration discourse relations, as in (15): the imperfect triggers the Background relationship, along with a temporal overlap between $e_\alpha$ and $e_\beta$ (i.e., $e_\alpha \subseteq e_\beta$) in (15a), whereas the passé simple imposes a strict precedence between $e_\alpha$ and $e_\beta$, along with Narration($\alpha, \beta$) in (15b).

(15) a. Yannig appuya sur l'interrupteur ($\alpha$). L'obscurité régnait dans la pièce. ($\beta$)
    'Yannig pressed-PS the switch. Darkness reigned-IMPF in the room' (= the room was dark)
    b. Yannig appuya sur l'interrupteur ($\alpha$). L'obscurité régna dans la pièce ($\beta$).
    'Yannig pressed-PS the switch. Darkness reigned-PS in the room' (= the room became dark)

These are fairly classical examples in the tense & aspect literature, in which they used to be treated in terms of 'temporal update', or 'moving forward' of the narrative line (cf. Hinrichs (1986), Kamp & Reyle (1993), etc.). I will rather adopt a SDRT-based account, which views such data as reflecting different discourse structures, in terms of rhetorical relations (and not just in terms of temporal ordering).

2.1.3 The perfective/imperfective viewpoint distinction (III): conditional structures
Another important caracteristics of the perfective/imperfective distinction is their contra ability to receive conditional / hypothetical readings. For instance, canonical aorists such as the French passé simple tend to reject conditional readings, while canonical imperfects are felicitous with such them. Thus Caudal & Roussarie (2005b) demonstrated that the passé simple does not accept readily si $P$, $Q$ (if $P$ (then) $Q$) constructions, in sharp contrast with the imperfect$^7$; see e.g., (16)-(18):

(16)  Si Yannig vient, Mona partira.
    'If Yannig comes, Mona will leave'.

(17)  Si Yannig venait, Mona partirait.
    'If Yannig came, Mona would leave'.

(18)  *Si Yannig vint, Mona partirait.
    'If Yannig came, Mona would leave'.

And whenever the passé simple does show up in si clauses, it receives non conditional interpretations, e.g. concessive (19) - (22), interrogative (23), exclamative (24), or temporal/explicative readings (25)-(26) :

(19)  S'il fut riche, il fut néanmoins malheureux. (concessive reading)
    'Although he was indeed rich, he was nevertheless unhappy'.

(20)  S'il fut souvent cruel, il lui arriva d’être généreux. (Leeman 2001) (concessive reading)

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7 This tense even accepts such readings in the consequent of conditional structures, not just in the antecedent, cf.: 'Un mètre de plus, et le train déraillait' ('Had the train gone any further, it would have been derailed').
'Although he was often cruel, he sometimes was generous'.

(21) Olivier parvint à maîtriser son appareil au point de pouvoir marcher sans canne (…). Même s'il fut alors obligé d'abandonner un à un les appartements dont il avait hérité (…). (G. Perec, La Vie Mode d'emploi : Romans, p. 346) (concessive)
'Olivier was so successful at mastering his walking device that he managed to walk without his crutches. But he was compelled to forsake the apartments he had inherited.'

(22) En ce qui concerne le mode de construction des coques, il est indiscutable que le bois (…) eut la vie dure. S'il fut, finalement, détrôné par le fer, ce ne fut pas sans difficultés. (Benoist-Pettier, Les Transports Maritimes, pp.81–82) (concessive)
'As for hull building techniques, it cannot be disputed that wood was used for a long time. Although wood was eventually deposed by iron, this new material had a hard time imposing itself.'

(23) Je me demande s'il fut riche. (interrogative)
'I wonder whether he was rich.'

(24) Jugez plutôt s'il fut riche ! (exclamative)
'See how rich he was!'

(25) Les membres d'une famille qui a produit un homme extraordinaire deviennent un peu fous par imituation : ils s'habillent comme lui, aident ses paroles, ses manières, ses habitudes ; s'il fut guerrier, on dirait qu'ils vont conquérir le monde ; s'il fut poète, qu'ils vont faire Athalie. (Châteaubriand, Mémoires d'Outre-Tombe t.3 (2), p. 533) (explicative/temporal)
'Those who are related to an extraordinary man become slightly mad by imitating him: they dress like him, put on airs while copying his manner of speech, his attitudes or his habits; if he was a warrior, they seem to be about to conquer to world; if he was a poet, they seem to be about to write another Athalie.'

(26) S'il fut un créateur, il le devait à ce qu'une pensée scientifique critique est essentielle. (Google)
'He was a creator because a critical scientific reflexion is essential [to be one].' (explicative)

Note that it is a prediction of the bove typologi cal observation that so-called preterits should be compatible with conditional readings; the prediction is indeed borne out in Germanic languages. 8

2.1.4 The perfective / resultative viewpoint distinction: morpho-syntactic tests and Explanation vs. Narration

Moving now to the perfective / resultative viewpoint (or aoriste/perfect) distinction, it is an essential characteristics of canonical perfects that they do not combine with so-called past temporal modifiers, as illustrated in (27) (but of course, this feature is not distinctive any more for semantically 'aoristicized' perfects, cf. (28); tenses such as the passé composé are felicitous with past temporal modifiers):

(27) *Yannig has left on Monday.
(28) Yannig est parti lundi.
Yannig leave-PC-3.sg Monday.

The other shedding line between canonical aorists and perfects is really about resultativity vs. perfectivity. Resultative viewpoints, because they focus on result stages, allow for an overlap between the reference interval R (in the sense of Reichenbach, 1947) and the described result stage. This, in turn, is a likely reason for their ability to licence temporally and causally reverse discourse relations (an intuition shared e.g. by de Swart & Molendijk 2000, Caudal 2000…): indeed, from the point of view of the R interval, result stages are not temporally ordered. Vice versa, since perfective viewpoints focus on inner stages and require a change-of-state to take place, they cannot create a similar effect of relative under-determination

8 The same observation might apply to Romance languages too, albeit in a diachronic manner. This would be an interesting fact to check e.g., with the passé simple in late Old French / early Middle French, since this tense was also a preterit, then.
of the temporal order. And indeed, the *passé simple* (PS) and the *passé composé* (PC) sharply differ with respect to the inversion of causal and temporal ordering, as shown in (29a) vs. (29b): the *passé simple* rejects it, while the *passé composé* licences it.9

(29) a. La maîtresse gifla (PS) mon fils. ??Il arriva (PS) en retard.
   b. La maîtresse a giflé (PC) mon fils. Il est arrivé (PC) en retard.

   The teacher slap-PS(a)/PC(b) my son in the face. He arrive-PS(a)/PC(b) late.

   'The teacher slapped my son in the face. He arrived lated.'

More should be said about the impossibility of allowing reverse causal order with canonical perfective viewpoint tenses. Many problematic examples have to be accounted for, notably those involving some kind of temporal encapsulation (de Saussure 2000:42, Danlos 1999). For instance, when a verb describes a complex eventuality $e_\alpha$ with an external causing event in the sense of Rappaport & Levin (1996) while another verb describes an event $e_\beta$ which is coreferent with the external causing subevent of $e_\alpha$, then we have $e_\beta \subset e_\alpha$ instead of $e_\alpha \prec e_\beta$, cf. (30)-(31):

(30) Max cassa la carafe. Il la heurta contre l'évier.
    Max broke-PS the carafe. He hit-PS it against the sink.

(31) Roger tomba malade. Il mangea des champignons. (de Saussure 2000:42)
    Roger fell-PS sick. He ate-PS mushrooms.

I will leave this an as open issue for future research.

Conversely, it is also remarkable that 'canonical' perfects such as the English present perfect rule out strict temporal ordering of events – that is, they cannot be used to describe sequences of events, as in the case of the *Narration* discourse relation, cf. (32), whereas canonical perfects are fully compatible with a discourse relation involving a reverse causal order, namely *Explanation*, cf. (33):

(32) *The British fleet has shelled the Bismarck. ??It has sunk. (*Narration)

(33) The Bismarck has sunk ($\pi_1$). The British fleet has shelled it ($\pi_2$). (Explanation)

To put it short, canonical perfects and canonical aorists have complementary distributions in two respects: (i) at the compositional semantic / morpho-syntactic level; (ii) at the discourse / semantics-pragmatics interface level.

3 The formal framework: preliminary issues

After this review of the empirical properties of a number of classes of tenses, I will try and propose a formal account for them within the SDRT framework. But I need first to present some relevant properties of the SDRT semantics/pragmatics interface, and second to discuss the model of tense of aspect I will use in this paper. I adopt here a formal model for tense and aspect formulated in Caudal (2005) and Caudal & Roussarie (2004, 2005). The compositional part of the model is based on a DRT-style semantics (and in fact, an underspecified kind of DRT, in the spirit of UDRT; cf. Kamp & al., 2005).

9 By and large, the kind of analysis I will propose below for the *passé simple/passé composé* contrast w.r.t. the *Narration* relation will be based on the following intuition: in order to be established, the *Narration* relation requires (as a precondition) that a transition between two eventualities can be computed at the semantics/pragmatics interface (i.e., on the basis of the combined contribution of linguistic information, world-knowledge, and discourse reasoning). By 'transition between eventualities' I mean (i) a strict temporal ordering between two distinct eventualities such that (ii) they form a strict sequence of changes-of-state. Changes-of-state, in their turn, will be modelled in terms of an explicit causal and temporal relationship between the 'core' of these eventualities (which I call an *inner stage*) and their result states.
3.1 The SDRT framework and aspect at the semantics/pragmatics interface

Within the SDRT framework, pragmatics and semantics are interfaced through two distinct logical components, namely the Logic of Information Content (LIC) (by and large a standard, dynamic predicate logic within which discourse structures (SDRSs) are interpreted relatively to a model; truth conditions are computed within that component), and the Logic of Information Packaging (LIP), a non-monotonic discourse reasoning component, which shallowly accesses the information content of SDRSs (so as to make it decidable), and performs discourse update. SDRSs and discourse relations are contextually computed and inferred within the LIP; this component implements the pragmatic principles underlying discourse processing (which consist in building up discourse representations, see Asher & Lascarides (2003) for a detailed implementation; see also Figure 1 for a graphic illustration).

Figure 1: Logic of Information Packaging vs. Logic of Information Content

LIP

PRAGMATICS

Building SDRSs

SDRSs

SEMANTICS

Interpreting SDRSs

LIC

πodel

3.1.1 Tenses and the SDRT framework

The interpretation of tenses within the SDRT framework raises two important questions:

(i) when and how should we make aspectual information available within the LIC and/or the LIP? This is a sub-case of the general issue mentioned by Asher & Lascarides (2003:194), i.e. how do we share the burden of interpretation between the two components, while keeping them computationally tractable? However, the tractability issue is clearly secondary here, since aspectual information is an unlikely candidate for any combinatorial explosion. The main point is that we can expect the semantics/pragmatics interface to play a key role for cases of pragmatic expansion (by introducing within the pragmatics more information than is present within the semantics) AND for cases of pragmatic reduction (by resorting to discourse reasoning in order to lift semantic underspecifications);

(ii) what can it mean, theoretically speaking, for a tense to be associated with interpretative effects which do not seem to have a semantic nature, and how can we make sense of this within the SDRT framework?

I’ll follow here Caudal & Roussarie’s (2005, 2006) hypothesis: I’ll argue that some parameters of the meaning of tenses resort to the compositional semantics, and hence pertain to the LIC, whereas others resort to discourse coherence, and play a role only within the LIP. As we will see, these different contributions are organized as follows: LIC-sensitive information is encoded as DRS conditions, whereas LIP-sensitive information is encoded as discourse-level axioms on speech act referents ($\pi$ terms).
3.1.2 How aspectual constraints can be stated within the SDRT framework

There are at least two ways in which aspect can affect the construction of discourse structure in SDRT:

- As discourse-relation specific axioms (constraints) associated with the Satisfaction Schema for Veridical Rhetorical Relations, cf. (34):

\[(34) \quad (w,f) \downarrow R(\pi_1, \pi_2) \Downarrow M(w',g) \quad \text{iff} \quad (w,f) \downarrow K_{\pi_1} \land K_{\pi_2} \land \phi_{R(\pi_1, \pi_2)} \Downarrow M(w',g)\]

\(\phi_{R(\pi_1, \pi_2)}\) represent discourse-relation specific axiom schemata (or meaning postulates); they express monotonic constraints on discourse relations, of the following form:

\[(35) \quad \phi_{R(\alpha, \beta)} \Rightarrow \text{conditions } (\alpha, \beta)\]

(where \(\text{conditions}(\alpha, \beta)\) states constraints on \(K_{\alpha}\) or \(K_{\beta}\) or discourse constituents introduced by them; Asher & Lascarides 2003:159). Note that since \(\phi_{R(\alpha, \beta)}\) is the antecedent for the meaning postulate, the latter cannot be verified unless \(K_{\alpha}\) and \(K_{\beta}\) are properly bound via the Satisfaction Schema for Veridical Rhetorical Relations).

As an illustration, (36) gives one of the meaning postulates associated with Elaboration:

\[(36) \quad \text{Temporal Consequence of Elaboration: } \phi_{\text{Elaboration}(\alpha, \beta)} \Rightarrow \text{Part-of } (e_\alpha, e_\beta)\]

- Within the Glue Language:

The Glue Language pertains to the LIP; its primary task is to combine information stemming from natural languages with other sources of information so as to update (or revise) the discourse context by attaching new information to old information via discourse relations. Technically speaking, the LIP uses axiom schemata in the Glue Language (or ‘Glue Logic Axioms’) in order to compute rhetorical relations. Their form is shown in (37) – \(?(\alpha, \beta, \lambda)\) indicates that \(\beta\) is to be attached to \(\alpha\) within constituent \(\lambda\) (= the label which immediately outscopes both \(\alpha\) and \(\beta\); \(R(\alpha, \beta, \lambda)\) is the inferred discourse relation, in case 'some stuff' holds true. (cf. Asher & Lascarides pp. 187 sqq., 473 sqq.)

\[(37) \quad (?(\alpha, \beta, \lambda) \land \text{some stuff}) > R(\alpha, \beta, \lambda)\]

To take (again) the example of the Elaboration relation, (38) gives one of the Glue Logic axioms available for that discourse relation:

\[(38) \quad \text{Elaboration: } (?(\alpha, \beta, \lambda) \land \text{Top}(\sigma, \alpha) \land \text{cause}_D(\sigma, \beta, \alpha) \land \text{Aspect}(\alpha, \beta)) > \text{Elaboration}(\alpha, \beta, \lambda)\]

where \(\text{Aspect}(\alpha, \beta)\) represents conjunctions of aspectual constraints on \(e_\alpha\) and \(e_\beta\) (= spells out the different aspectual variants of the rule). I will make use of both methods, plus a third one, as we will see.

3.2 Stage structure

I assume with Caudal (2005) that the aspectual contribution of each (disambiguated) verb consists in a stage structure. (I take stages to be linguistically determined 'subevents', a bit in the sense Kamp & Reyle (1993) – although I don’t take them to be mereologically related, unlike e.g. Pustejovsky (1995); see Caudal (2005) for details). The idea is that lexical aspectual entries shouldn't be associated with only one event descriptor, but with a more complex structure relating several distinct event descriptors, each of them corresponding to a distinct event stage. Formally speaking (cf. Figure 1 for an illustration), stage structures are lists containing
(i) a set of stages, modelled by sub-DRSs; for the purpose of the present paper, it is enough to distinguish between result stages (RStages), which correspond to resultant states (focused on by resultative viewpoints, see e.g. the English perfect; they are noted here \(e_R\), instead of \(s\), the standard DRT notation), and inner stages (IStages), which correspond to the ‘core’ subevent (typically focused on by imperfective viewpoints)\(^\text{10}\);

(ii) a set of aspectuo-temporal stage relations, determining in particular whether a stage structure is telic or not; thus Conseq_Telic appears within telic stage structures (it connects the IStage DRS to the RStage DRS of a telic stage structure, cf. (39), whereas the Conseq_Atelic relation appears within atelic stage structures, cf. (40) (where \(e < e^\circ\) indicates that the left part of \(e^\circ\) overlaps with \(e\));

(iii) a set of ‘salience’ ascriptions to stages (via function \(\varsigma\)) which will not be discussed here as they are irrelevant to the present issue but see Caudal, 2005.

\[
\begin{align*}
(39) \quad & \text{Conseq}_\text{Telic}(\langle U_1, \{ \ldots P(e_1) \ldots \} \rangle, \langle U_2, \{ \ldots Q(e_2) \ldots \} \rangle) \rightarrow e_1 < e_2 \\
(40) \quad & \text{Conseq}_\text{ATelic}(\langle U_1, \{ \ldots P(e_1) \ldots \} \rangle, \langle U_2, \{ \ldots Q(e_2) \ldots \} \rangle) \rightarrow e_1 <^\circ e_2 \\
\end{align*}
\]

Figure 2: Stage structure for leave

\[
\begin{align*}
& \{ K_I : \lambda e \lambda y \lambda x \text{IStage}_\text{leave}(e_I, x, y) \} \\
& \{ K_R : \lambda e \lambda y \lambda x \text{RStage}_\text{leave}(e_R, x, y) \} \\
& \{ \text{Conseq}_\text{Telic} (^{\text{K}_I, ^\circ \text{K}_R}) , \{ \varsigma(\text{K}_I, 2) ; \varsigma(\text{K}_R, 1) \} \} \text{leaveSTS}
\end{align*}
\]

Higginbotham (2000) defends a related approach to event semantics insofar as he also assumes that the aspectual contribution of tenseless clauses necessarily boils down to a simple, single descriptor. However, Caudal's (2005) empirical motivations and theoretical choices are different.

Higginbotham claims that the \(\text{in} <X\text{ time}\) phrase actually takes two argument positions, and that this requires the verb to offer not just one but two event positions (E-positions). Caudal (2005)'s central claim, on the contrary, is that the aspectual contribution tenses should be understood as complex viewpoint functions, rather than mere aspectual-type shift operators, and that therefore, result and preparatory stages shouldn't be taken to be derived from inner stages, but to be part of the aspectual lexical information at stake. In support of this hypothesis, Caudal observes that some verbs allow the \(\text{for}\) phrase to bear on the result state even with a non-resultative tense, as in (41), a possibility excluded with most telic verbs:

\[
\begin{align*}
(41) \quad & \text{Yannig partit pendant trois jours.} \\
& \text{Yannig leave-PS-3sg for three days.} \quad '\text{Yannig left for three days}' \\
(42) \quad & \text{*Yannig arriva pendant trois jours.} \\
& \text{Yannig arrive-PS-3sg for three days} \quad '\text{Yannig arrived for three days}'.
\end{align*}
\]

This suggests that the result stage information associated with \textit{leave} is different from those associated with ordinary telic verbs. Therefore, telicity alone is not sufficient in order to explain the availability of result stages for aspectual operations; and only a theory allowing result stages to be lexically encoded can explain the contrast between (41) and (42). Stage structure offers this very possibility.

\(^{10}\) For further details and a wider range of stages and stage relations, see Caudal (2005, 2007, to appear).
Finally, while Higginbotham assumes that a pair of event descriptors should be used only to represent telic verbs\textsuperscript{11}, Caudal (2005) assumes that every verb should receive at least two stages (possibly three), and that the nature of stage relations determines whether the verb is telic or not, cf. (39) vs. (40).

### 3.3 The semantic contribution of tenses: an illustration

Of course, it is natural for such a framework to treat the aspectual contribution of tenses in terms of viewpoint functions. Specifically, viewpoints will be represented as functions applying to stage structures; they introduce one or two 'focused' stages within the compositional semantics of a clause.

To take an example, the \textit{Neutral_Resultative} viewpoint function represents the aspectual contribution of the English simple present perfect. It selects a result stage within a stage structure \( eat_{STS} \) (i.e., the aspectual contribution of a tenseless sentence), applies it to whatever entities \( u, v \), etc. represent the arguments of \( eat \) (i.e., we have \( RStage_{eat}(e,u,v) \)), and integrates the result within the compositional semantics. To illustrate this, two notational variants of the treatment of (43) are given in (44) and (44\textsuperscript{')}).

\begin{align*}
(43) & \quad \text{Yannig has eaten his pancake.} \\
(44) & \quad \pi \\
& \quad \pi: \begin{array}{c}
\upsilon \quad e \quad u \quad v \\
\text{named}(u, \text{Yannig}) & \text{pancake}(v) \quad e \prec< X\text{Now} \\
\text{e:} & \text{Neutral\_Resultative}\left( eat_{STS}, u, v \right)
\end{array} \\
& \quad \text{Pres\_Perfect\_Resultative\_IVP}(\pi)
\end{align*}

\begin{align*}
(44\textsuperscript{'}) & \quad \pi \\
& \quad \pi: \begin{array}{c}
\upsilon \quad e \quad u \quad v \\
\text{named}(u, \text{Yannig}) & \text{pancake}(v) \quad e \prec< X\text{Now} \\
\text{e:} & \text{RStage}_{eat}(u,v)
\end{array} \\
& \quad \text{Pres\_Perfect\_Resultative\_IVP}(\pi)
\end{align*}

\textit{Pres\_Perfect\_Resultative\_IVP} is the illocutionary viewpoint operator associated with the simple present perfect. Its function is to block discourse relations such as \textit{Narration} within the LIP (I take the \textit{Narration} relation to require both the inner and the result stage to be present within the LIP; but since the perfect should arguably allow both stages to be present within the discourse reasoning component, there should be an additional bit of machinery preventing \textit{Narration} from being computed).

### 4 Implementing tenses allowing interpretative expansion

In this section, I’m going to discuss in greater detail how IVPs can be used within the LIP to guide the computation of discourse structure. I’ll focus on the most stimulating and intriguing bit of data reviewed above – namely tenses which require some interpretative expansion device, allowing them to receive readings which seem to be at least unpredictable and at most contradictory with their apparent compositional semantic contribution.

\textsuperscript{11} I.e., \((e_1, e_2)\), where \(e_1\) corresponds to my inner stage, and \(e_2\), the 'telos', seems to be either the associated culmination point or the associated consequent state – Higgobotham's (2000) argumentation is waiving between the two options.
4.1 A word on Narration and tenses evolving into aorists

One of the basic ideas underlying this whole account about perfective viewpoint-like interpretations of imperfects or perfects is that Narration should hold only between events interpreted as transitional. In other words, Narration will require in the LIP the presence of both inner and result stages in order to be computed. This translates as a modification of the usual Glue Logic axioms about Narration:

\[(?\langle\alpha,\beta,\lambda\rangle)\land \text{some stuff} \land \text{Aspect}(\alpha,\beta) \Rightarrow \text{Narration}(\alpha,\beta,\lambda)\]

Aspect(\alpha,\beta) translates as transition(\alpha) \land transition(\beta), and transition(\alpha) is defined as the simultaneous validity of the inner stage and result stage DRSs in the LIP, cf. (46):

\[(46) \text{Transition: } \text{transition}(\alpha) \rightarrow K_I(\alpha) \land K_R(\alpha)\]

where \(K_I(\alpha)\) is a functional composition from the general structure of a discourse representations and of the lexicon. It retrieves the inner stage from the stage structure associated with the lexical entry of the verbal head describing the main event contained within the DRS \(K\) underlying the speech act referent \(\beta\). \(K_R\) is a similar functional composition retrieving a result stage. Technically, these axioms result in introducing within the LIP the DRSs corresponding to the (perfectively viewed) inner stage, plus the result stage – that is, it amounts to creating within the LIP the aspectual interpretative configuration normally ascribed to perfective viewpoint tenses. We’ll come back to the formal definition of \(K_I\) and \(K_R\) in the following section.

I will make extensive use of the Transition rule within the Glue Logic to ensure that perfectly interpreted tenses which are not (yet) semantically perfective (that is, imperfects or perfects evolving into aorists) create the appropriate pragmatic expansion effects within the LIP.

4.2 The passé composé in Old French: a divorce between semantics and pragmatics

First, let us turn to the case of the French passé composé (PC). The following figure sums up its evolution, during which its interpretation gradually shifted from a canonical perfect toward an aorist-like perfect:

<table>
<thead>
<tr>
<th>Period of time</th>
<th>Brand of perfect to which the PC belongs</th>
<th>Past time modifiers</th>
<th>Narrative discourses</th>
</tr>
</thead>
<tbody>
<tr>
<td>9th-11th c.</td>
<td>Canonical perfect</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>12th-16th c.</td>
<td>Non-canonical perfect with aoristic pragmatics</td>
<td>*</td>
<td>OK</td>
</tr>
<tr>
<td>17th c. onwards</td>
<td>Perfect with a partly aoristic semantics</td>
<td>OK</td>
<td>OK</td>
</tr>
</tbody>
</table>

The PC is clearly worth studying for the Middle French/Classical French period: it then possesses a semantic property which is seemingly at odds with the uses of the PC in discourse. Indeed, although the PC then began to be used in narratives like a perfective past tense, it still lacked a fundamental property of that class of tenses – namely, it wasn’t able yet to combine with past time modifiers. In other words, its semantics was still that of canonical perfects (cf. the infelicitous *John has left on Monday).

(47) is an example of 12th century PC, represented under (48) (see also its notational variant (48’)). The aspectual viewpoint function PCResultative(aller_STS, \(u, v\)) selects the result stage DRS \(R_{\text{Stage_aller}(e,u,v)}\) within the stage structure aller_STS of the verb aller (‘to go’).

Old French PC is associated with the Present_Resultative2_IVP function given under (49). Technically speaking, (49) is to be understood as follows: whenever a discourse constituent/speech act term \(\pi\) is presented under the Present_Resultative_IVP2 illocutionary viewpoint, then the inner stage lexically related to the main eventuality referred to in \(\pi\) holds within the LIP. This rule has crucial consequences for the way the PC behaves at the semantics/pragmatics interface, because it licences the establishment of Narration.
(47) [Rollant] est alet a sa fin.  (‘Rollant has died’)
(Chanson de Roland, 176.18; 12th century)

(48) \[
\pi : \\
\begin{array}{c}
\text{named}(u, \text{Rollant}) \quad \text{end}_of(u,v) \\
\end{array}
\]
\[e <^° XNow \]
\[\pi \text{ named}(u, \text{Rollant}) \quad \text{end}_of(u,v) \quad e <^° XNow \]
\[\pi \text{ Present Resultative}_2 _IVP(\pi) \]

(48’)

\[
\pi : \\
\begin{array}{c}
\text{named}(u, \text{Rollant}) \quad \text{end}_of(u,v) \\
\end{array}
\]
\[e <^° XNow \]
\[\pi \text{ named}(u, \text{Rollant}) \quad \text{end}_of(u,v) \quad e <^° XNow \]
\[\pi \text{ Present Resultative}_2 _IVP(\pi) \]

(49) Monotonic rule about Middle French PC and the semantics/pragmatics interface:
\[\text{Present Resultative}_2 _IVP(\pi) \rightarrow K_1(\pi)\]

Indeed, (49) renders possible the application of the modified Glue Logic axioms about Narrative (cf. (45) and (46) above) to sentences in the (Middle French) PC; that is, if (49) is verified, then transition(\pi) holds true, and then \pi can be attached by Narrative to any accessible \pi' such that transition(\pi') is true too.

Again, K_1 can be defined in terms of functional composition from the general structure of discourse representation (i.e., SDRS) and of the lexicon. In SDRT, each speech act Referent \pi labelling a sentence is mapped onto a DRS (representing the semantic content of the sentence). In this DRS, it is possible to access the predication holding about the main eventuality (see Asher 1993 for the definition of the main-eventuality function). Recall that the predication is of the form \[e: \{\text{Aspectual ViewPoint}(\text{verb}_\text{STS}(u_1, u_2, \ldots))\}\]
where \verb_\text{STS} stands for the stage structure appearing within the lexical entry of the verbal head. Function \text{K}_1 retrieves the specified inner stage from the stage structure \verb_\text{STS} (that is, \text{IStage}_\text{aller}(u,v) in (48)-(48')). In other words, we assume that via a function \text{K}_1, one can retrieve the appropriate inner stage descriptor related to the main eventuality Referent in \pi, and we note this inner stage \text{K}_1(\pi).

Crucially thus, the consequent part of rule (49) is a conclusion which can be drawn only within the LIP; it makes \text{K}_1(\pi) available for computing discourse relations such as Narrative, and is directly responsible for the 'interpretative expansion' effect mentioned above.

4.3 The case of the French imparfait: yet another interpretative divorce

Besides the PC in Middle French, the (Post-Classical) French imparfait also illustrates pragmatic, interpretative expansion, through its so-called 'narrative readings'. The (compositional) semantic contribution of the imparfait is given under (50)-(51). It is typically that of an imperfective viewpoint tense, along with a special kind of IVP operator, called NonTransInactual_\_IVP.

(50) \text{Yannig mangeait sa crêpe.}
Yannig eat-IMPF-3.sg. his pancake
‘Yannig was eating his pancake’

\[\pi \text{ Present Resultative}_2 _IVP(\pi) \rightarrow transition(\pi)\]

12 A simple alternative to this rule would be \[\text{Present Resultative}_2 _IVP(\pi) \rightarrow transition(\pi)\]; but since arguably the result stage \text{K}_R is already valid within the LIP, it is hardly necessary to try and infer \text{K}_R(\pi).
The so-called ‘narrative imparfait’ is a reading of that tense known to have appeared in Modern, Post-Classical French. It is exemplified in (52); the imparfait is then interpreted like a past, perfective viewpoint tense, such as e.g. the passé simple; indeed, it can substituted with it in this context.

(52) (Quelques instants plus tard,) Maigret descendait (e₁) l’escalier, traversait (e₂) le salon aux meubles disparates, gagnait (e₃) la terrasse ruisselante des rayons déjà chauds du soleil. (Simenon, La nuit du carrefour, LdP 2908, p. 61) (from Caudal & Vetters 2005)
A moment later, Maigret walked (#was walking) down the staircase, went (#was going) across the dining-room and its ill-assorted furniture, and then reached (#was reaching) the terrace, which was dripping with the sun’s first hot rays.’

Although this might be taken as a case of aspectual underspecification, there are however some intriguing facts to be accounted for. First, this reading cannot arise outside of narrative contexts, cf. (53). More specifically, the imparfait remains interpreted like an ordinary imperfective viewpoint tense when it is not embedded within a sequence of events (indeed, we have e₁<e₂<e₃ in (52)). In such contexts, the imparfait also rejects the kind of modifiers normally associated with perfective viewpoint tenses, cf. (54).

(53) Maigret descendait l’escalier.
Maigret go-down-IMPF-3sg. the stair
‘Maigret was going (#went) downstairs.’

(54) #Jean marchait pendant une heure.
Jean walk-IMPF-3psg for one hour.
'Jean was walking for an hour'.

Following the intuition underlying the analysis of similar data in Caudal & Vetters (2003, 2005), I consider that the so-called narrative interpretation of the imparfait is triggered by the establishment of the Narration discourse relation, which enforces a contextual, pragmatic interpretative expansion of the sentence at stake. Informally, the idea is that a discourse like (52), world-knowledge gives us a strict temporal ordering between e₁, e₂ and e₃, and causes the imparfait to be interpreted like a past perfective tense within the pragmatics. But strictly speaking, this does not involve scriptal knowledge; events of going downstairs and crossing corridors are not scriptally associated with events of opening doors.

As an illustration and a comparison, in the case of (56), the corresponding Falling and Helping axiom appears under (57): it tells us that when an event eₐ of falling and an event e₉ of helping-up are connected, then normally speech act term α stands in an Occasion relation to speech act term β. Occasion(α,β) expresses a scriptal relation, under which β somehow follows from α, without really being caused by it. Note that > represents non-monotonic inference (as opposed to →, i.e., monotonic inference).

(55) Occasion I: (?(α,β,λ) ∧ [φ(eₐ)]α ∧ [ψ(e₉)]β) > Occasion(α,β)₁³
(57) **Falling and Helping:** $(? (\alpha, \beta, \lambda) \land \text{fall}(e_1, x) \land \text{help-up}(e_2, y, x)) \beta > \text{Occasion}(\alpha, \beta)$

Such scriptal knowledge can in turn help establish the *Narration* discourse relation within the LIP in a non-monotonic fashion (following Asher & Lascarides, 2003), thanks to axiom (64):

(58) **Narration I:** $(? (\alpha, \beta, \lambda) \land \text{Occasion}(\alpha, \beta)) > \text{Narration}(\alpha, \beta, \lambda)^{14}$

This however, is insufficient to account for sequences such as (52) or (59), where scriptal knowledge does not seem to play any role. I'd rather invoke a specific instantiation of a general law about 'event incompatibility' that makes us interpret (59) as involving temporal succession: John cannot stop smiling AND take a bite of his sandwich at the same time.

(59) John stopped smiling $(e_a)$. He took one more bite of his sandwich $(e_o)$.

I call *Sequence* this sort of 'bare-bone' succession relation, and define it in (61) in terms of two events $e_a$ and $e_o$ being mutually exclusive about a certain common participant $x$ (see (63) for an attempt at defining such mutually exclusive event descriptions). *Sequence* monotonically implies the absence of any causal link between these events, cf. (62) (so as to prevent establishing it whenever stronger, causal relations should hold). We can now propose another axiom for *Narration* under (64); its purpose is to non-monotonically infer the *Narration* relation from *Sequence* (cf. also the inference of *Narration* from *Occasion*, (60)).

- **Summary of the new *Narration* axioms:**

(60) **Narration I:** $(? (\alpha, \beta, \lambda) \land \text{Occasion}(\alpha, \beta) \land \text{transition}(\alpha) \land \text{transition}(\beta)) > \text{Narration}(\alpha, \beta, \lambda)^{15}$

(61) **Sequence:** $(? (\alpha, \beta, \lambda) \land \text{phi}(e, x) \land \text{psi}(e, x)) \beta > \text{Sequence}(\alpha, \beta)$

(62) $\phi_{\text{Sequence}}(\alpha, \beta, \lambda, \gamma, \delta) \Rightarrow (\neg \text{cause}(e_a, e_b) \land \neg \text{cause}(e_b, e_a))$

(63) $\phi_{\text{E-Exclude}}(\phi, \psi, x) \leftrightarrow (\forall e, e'(\phi(e) \land \psi(e')) \rightarrow \neg e e')$

(64) **Narration II:** $(? (\alpha, \beta, \lambda) \land \text{Sequence}(\alpha, \beta) \land \text{transition}(\alpha) \land \text{transition}(\beta)) > \text{Narration}(\alpha, \beta, \lambda)$

(66) **Transition:** $\text{transition}(\alpha) \Rightarrow K_{\tau}(\alpha) \land K_{\beta}(\alpha)$

- **Glue Logic rule on the (pragmatic) interpretative expansion of the *imparfait*:**

(65) $\text{NonTransHactual}(\beta) \land \text{Sequence}(\alpha, \beta) > \text{transition}(\alpha) \land \text{transition}(\beta)^{16}$

Rule (65) states that sequences of events described by sentences in the *imparfait* constitute transitions, in fact – that is, that they cause the validation of the inner stage and result stages within the LIP, thereby triggering a (pragmatic) interpretative expansion of the aspectual contribution of the *imparfait*. Note that this leaves alone the semantic contribution of that tense within the LIC, which remains limited to an inner stage DRS, as exemplified in (51). But the real key axioms are (64) and (60); they associate *Narration* with transitions in general – either in combination with *Sequence* or with *Occasion*.

Of course, as was shown by Bras et al. (2001) cue phrases such as *und denn* ('and then') monotonically impose the *Narration* relation, cf. (67). This gives the additional axiom (66), which reflects a stronger brand of *Narration* (as opposed to the *Occasion*-based *Narration*; see Bras et al. (2001) for a discussion):

---

14 This means that $\beta$ is to be attached to $\alpha$ with the *Narration* relation, $\alpha$ being an available site within context $\tau$, and that the discourse relation is to be incorporated into the logical form as a conjunct on the formula labelled $\lambda$.

15 This means that $\beta$ is to be attached to $\alpha$ with the *Narration* relation, $\alpha$ being an available site within context $\tau$, and that the discourse relation is to be incorporated into the logical form as a conjunct on the formula labelled $\lambda$.

16 Though empirically adequate at first sight, this axiom could be improved. I leave this as an open issue for discussion.
(66) Narration III: \( (? (\alpha, \beta, \lambda) \land \text{Cue-Phrase}(\beta) \land \text{transition}(\alpha) \land \text{transition}(\beta)) \rightarrow \text{Narration}(\alpha, \beta, \lambda) \)

ex.: \( (? (\alpha, \beta, \lambda) \land \text{und-denn}(\beta) \land \text{transition}(\alpha) \land \text{transition}(\beta)) \rightarrow \text{Narration}(\alpha, \beta, \lambda) \)

(67) d hans if huigang. und denn hət eʃ sin hunt gfu 'tʃət.

'Hans went home and then he fed his dog.'

Note that examples like (68) are easily explained because Narration remains computed in a non-monotonic fashion (this is an instance of so-called 'garden path sentence'; at first, the interpreter believes that rentrait is a case of narrative imparfait, until she comes across the temporal subordinate lorsqu'en passant..., and has to revise her interpretation of that tense):

(68) La nuit tombée, elle rentrait au Tourmet, lorsqu’en passant dans un petit boqueteau, elle surprit un bruit de course entre les arbres. (Exbrayat, L’honneur de Barberine, coll. Le Masque, p. 59)

5 Generalizing the approach: applying the toolbox

But as we have seen above, pragmatic expansion does not exhaust the list of interpretative effects associated with tenses. I'll generalize the approach sketched in the previous section, by applying it to the various cases of semantic and pragmatic evolution for tenses.

5.1 Preterits: semantic underspecification & pragmatic reduction

Preterits require at the same time a treatment in terms of semantic underspecification (they must be allowed to convey at least two different kinds of aspectual viewpoints, namely e.g., the perfective and imperfective viewpoints) and in terms of pragmatic reduction: indeed, while they are semantically underspecified, the aspectual interpretation of preterits can be narrowed down in context, as in (69), where the sentence A thick blanket of snow covered the fields is rendered aspectually specific by the kind of discourse relation in which it is involved: Narration in (69a), vs. Background in (69b).

(69) a. A snow storm began. A thick blanket of snow covered the fields.
   b. We eventually reached this northern district. A thick blanket of snow covered the fields.

Very sketchily, the sort of account required by the simple past should present the following properties:

- The compositional part of the semantics should be couched within an underspecified semantics, for instance UDRT (cf. Kamp et al. 2005), allowing imperfective and/or perfective readings, depending on the involved Aktionsarten;
- The reduction of the ambiguous readings at the semantics/pragmatics interface should be effected via discourse relations (for instance Narration entails a perfective interpretation, whereas Background entails an imperfective interpretation);
- Finally, contextual disambiguation should be achieved by means of meaning postulates associated with the interpretation of discourse relations; they should lift the underspecification of the compositional semantics whenever possible, cf. the discussion of (74) and (75) below:

A tentative UDRT implementation of the simple past is given under (36). In short, an Underspecified DRS (or UDRS) is a semi-lattice structure (i.e., a partially ordered structure) comprising at least two distinct sub-DRSs noted \( l \), namely the bottom UDRS \( l_\cap \), and the top UDRS \( l_\emptyset \). In this case, instead of resorting to the partial-ordering mechanism, underspecification is modelled by means of the UDRT ambiguity operator, i.e. \( \lor \). To put it short, an U(underspecified) DRS \( [K_1 \lor K_2] \) remains unresolved until some co(n)textual information makes either \( K_1 \) or \( K_2 \) contradictory, thereby eliminating the ambiguity.

The bottom UDRS \( l_\cap \) combines the stage structure information derived from cover and its complements, with the aspectual viewpoint function Preterit_telicity contributed by the simple past. \( l_\cap \) is
repeated to show that Preterit_Telicity is in fact applied to the stage structure of cover (cover_STS) together with the individuals $u$ and $v$. Finally, the aspectu-temporal UDRS $I_j$ combines the two possible aspectual contributions of the simple past, namely a perfective view on the described eventuality expressed by condition $\overrightarrow{e} \subseteq t_{loc}$, or an imperfective one, expressed by $t_{loc} \subset \overrightarrow{e}$. Therefore, the following equivalences hold:

(70) a. perfective$(e) \leftrightarrow e \sqsubseteq (t_{loc})$

b. imperfective$(e) \leftrightarrow (t_{loc}) \subset e.$

(71) A thick blanket of snow covered the fields.

After DRS unification, we can get the two following DRSs:

(72) $K_1 = \begin{array}{c}
\text{b v e n t} \\
\text{a_thick_blanket_of_snow(b)} \\
\text{fields(v)} \\
\text{e_1: IStage_cover(b,v)} \\
\text{K_1}
\end{array}$

(73) $K_2 = \begin{array}{c}
\text{b v e n t} \\
\text{IStage_cover(b,v)}
\end{array}$

Technically, $\overrightarrow{e}$ represent a variable in need of a binding value, whereas $\downarrow e_1$ represents such a binding value. The UDRS update procedure proceeds by binding (up) variables with (down) values, before moving to UDRS unification proper – thus merging the different sub-(U)DRSs into a single (U)DRS, hopefully reducing or eliminating ambiguities See Kamp et al. (2005) for details. I am also leaving out much that should be said about temporal modifiers such as *yesterday* etc. Note also that $t_{loc}$ is treated here as a local constant: its value is past ($t_{loc} < n$) – it corresponds more or less to the neo-reichenbachian $R$ (reference time) interval. And of course, $n$ corresponds to the neo-reichenbachian $S$ (speech time) interval.
bounded(e_i) and \( \neg \text{bounded}(e_i) \) should be interpreted as conditions on the telic vs. atelic reading of the IStage eventuality e_i; the telic reading of cover should pattern with the bounded(e_i) condition, while the atelic (static) reading should pattern with the \( \neg \text{bounded}(e_i) \) condition. See Caudal (to appear) for a detailed implementation of how such a connection can be achieved by means of special meaning postulates on stage structure.\(^{18}\)

The contextual disambiguation of (71) will be achieved by axioms such as (74) and (75), which spell out some (compositional) semantic consequences of the Narration vs. Background discourse relations. In turn, when combined with equivalences (70a/b), these meaning postulates will produce the appropriate (72) or (73) as a the unique interpretation of (71).

\[\phi_{\text{Narration}}(\alpha,\beta) \Rightarrow (\text{co}\text{ver}_{\alpha} < \text{co}\text{ver}_{\beta} \land \text{perfective}(\text{co}\text{ver}_{\alpha}) \land \text{perfective}(\text{co}\text{ver}_{\beta}))\]

\[\phi_{\text{Background}}(\alpha,\beta) \Rightarrow \text{imperfective}(\text{co}\text{ver}_{\beta})\]

Note that preterits are more widespread than one could expect; even Romance has had its share of preterits through the course of history. To take a single example, the French passé simple is derived from the Latin perfectum, evolved into a preterit in Old and (early) Middle French, capable of imperfective viewpoint readings with stative verbs (cf. Moignet (1988 : 256), H. Bonnard & C. Régnier (1997 : 133)), and perfective viewpoint readings with non-stative verbs, cf. (76):

\[\text{(76)}\]

\[
\begin{align*}
\text{En l’espeise d’un grand buissun} & \quad \text{In the thick of a bush} \\
\text{Vit une bise od un foün ;} & \quad \text{(he) saw a doe and a fawn;} \\
\text{Tute fu blanche cele beste} & \quad \text{the beast was all white} \\
\text{Perches de cerf out en la teste.} & \quad \text{and almost had the head of a stag} \\
\end{align*}
\]

(\text{Les Lais de Marie de France, ed. Garnier-Flammarion, p. 38})

To a large extent, the imparfait conveyed a subset of the aspectual semantics of the passé simple, cf. (77):

\[\text{(77)}\]

\[
\begin{align*}
\text{En cel tens tint Hoels la tere,} & \quad \text{At that time Hoel reigned-PS over the Earth,} \\
\text{Sovent en peis, sovent en guere.} & \quad \text{Sometimes in peace, sometimes in war,} \\
\text{Li reis aveit un suen barun,} & \quad \text{The king had-IMPF one among his barons} \\
\text{Ki esteit sire de Lïun :} & \quad \text{Who was-IMPF the Lord of Léon} \\
\text{Oridials esteit apelez ;} & \quad \text{Oridial he was called-IMPF;} \\
\text{De sun seigneur fu mult privez,} & \quad \text{He was-PS very close to his Lord} \\
\text{Chevaliers ert pruz e vaillanz.} & \quad \text{He was-IMPF a valiant knight.}
\end{align*}
\]

\[\text{18}\]

The idea is roughly that two meaning postulates should hold of certain aspectually ambiguous predicates P (namely, predicates associated with verbs such as cover which alternate between a stative and telic reading) – where Telic(P) is true iff P is telic and Dynamic(P) is true iff P is dynamic (i.e., non-stative):

(i) \( \forall P,e[[P(e) \land \text{bounded}(e)]] \Rightarrow [\text{Dynamic}(P) \land \text{Telic}(P)]\)

(ii) \( \forall P,e[[P(e) \land \neg \text{bounded}(e)]] \Rightarrow [\neg \text{Dynamic}(P) \land \neg \text{Telic}(P)]\)

\[\text{19}\]

Maybe one wouldn’t want any such an axiom to apply to imperfects licensing a perfective pragmatic expansion; indeed, there are arguments to maintain the view that the semantics of such tenses remain imperfective even within narrative contexts. But I’ll leave this question open, since there are also arguments suggesting the contrary…
De sa moillier out dous enfanz, He had-PS two children from his wife,  
Un fiz e une fille bele. A son and beautiful girl."

("Les Lais de Marie de France, ed. GF, p. 36-37"

The imperfective viewpoint readings of the *passé simple* exemplified in the first and fifth verse of (77) (and which contrast with its perfective viewpoint uses, cf. the eighth verse) seem to have mostly vanished by the end of the 13th century, according to H. Bonnard & C. Régnier (1997). Wilmet (1970) mentions that only *estre* (to be) retained for a while the ability to yield an imperfective reading with the *passé simple*.

5.2 Preterital perfects: more underspecification and more pragmatic reduction

Another case of pragmatic reduction we need to review is that of perfects having evolved towards preterits: they illustrate an even greater need of pragmatic reduction than ordinary preterits in the face of semantic underspecification. Indeed, such tenses exhibit a very high degree of underspecification, so high that it has to be contextually lifted in most cases. The Alemannic Perfekt provides us with a nice synchronic example of such an underspecified tense\(^\text{20}\), since it is also capable of resultative viewpoint readings, in addition to perfective imperfective viewpoint readings, cf. (8):

\[
\begin{align*}
(78) & \quad \text{Speaker A: } \text{haf an huph ? 'Are you hungry?'} \\
& \quad \text{Speaker B: } \text{na, i haf \text{f\text{O} \text{g\text{E}}} \textse. 'No, I’ve already eaten.'}
\end{align*}
\]

Contrary to the English *simple past*, the perfective vs. imperfective viewpoint readings of the Perfekt are not triggered by telicity, but by the atomicity vs. non-atomicity of the described event, cf. (79)-(82):

\[
\begin{align*}
(79) & \quad \text{vi\text{E} d ann\text{E} \text{ku if, if e\text{E} krank gsi} } \quad \text{(imperfective reading OK, perfective *)} \\
& \quad \text{'When Anna came in, he was sick.'} \\
(80) & \quad \text{vi\text{E} d ann\text{E} \text{ku if, hot e\text{E} \text{opfl ge\text{E}se} } } \quad \text{(imperfective reading OK, perfective ??)} \\
& \quad \text{'When Anna came in, he was eating apples.'} \\
(81) & \quad \text{vi\text{E} d ann\text{E} \text{ku if, hot e\text{E} an ku\text{E} xe ge\text{E}se} } \quad \text{(perfective and imperfective readings OK)} \\
& \quad \text{'When Anna came in, he ate/was eating a cake.'} \\
(82) & \quad \text{vi\text{E} d ann\text{E} \text{ku if, if e\text{E} gane . } } \quad \text{(perfective reading OK, imperfective reading *)} \\
& \quad \text{'When Anna came in, he left/*was leaving.'}
\end{align*}
\]

I will not go into details as far the precise implementation goes (see Caudal & Schaden (2005a,b)), since it presents many similarities to that offered above for the English *simple past*, namely:

- an underspecified aspectuo-temporal semantics (using e.g. a UDRT-style semantics, cf. Kamp et al. 1995), this time encompassing not only perfective/imperfective viewpoint readings, but also resultative viewpoint readings;
- pragmatic reduction mechanism \textit{via} discourse interpretation; discourse-relation specific axiom schemata/meaning postulates can impact the compositional semantics (cf. (35) and (74) above).

5.3 Aoristic perfects: from pragmatic expansion to semantic complexity

After these instances of pragmatic expansions, we need to review some cases of semantically complex tenses. They stem from ancient configuration of pragmatic expansions, which got more deeply conventionalized, and produced semantically complex tenses; the modern French *passé composé* will provide us with the necessary data. This tense is the by-product of a perfect having evolved towards an aorist (I am here drawing on Caudal & Roussarie (2004, 2005a) and Caudal (to appear) for this analysis of the *passé composé*). The idea is essentially that this tense is both aspectually and temporally complex: on

\[^{20}\text{It is unclear to me whether the French }\textit{passé simple} \text{ still had resultative uses in Old French, but it might well be the case; but surely, the Alemannic }\textit{Perfekt} \text{ is not alone in this league.}\]
the one hand, it describes a (strictly past) inner stage (cf. (83)), but on the other hand, it also describes a presently relevant result stage (cf. (84)). These two kinds of contributions can be intertwined (cf. (85)). Since it exhibits a double aspectual (resultative and perfective) and temporal (present and past) contribution, the *passé composé* should be considered as complex (and not as underspecified).

(83) Yannig est parti hier.  (past + perfective)  
'Yannig left yesterday'.

(84) J'ai mangé, je n'ai plus faim.  (present + resultative)  
'I've eaten, I'm not hungry anymore.'

(85) Le lion a mangé hier, il n'a pas faim.  (past+perfective+resultative)  
'The lion ate yesterday, it's not hungry anymore.'

I claim that this temporal complexity must be invoked in order to explain the following contrast:

(86) Yannig a quitté son bureau depuis deux jours. (Et il est encore absent)  
'Yannig left his office two days ago. (And he is still away)'.

(87) *Yannig a été malade depuis deux jours. (Et il l'est encore malade)  
'Yannig has been ill for two days. (And he still is)'

Now it sounds reasonable to assume that the *depuis deux jours* phrase has the following semantics: it locates the beginning of an eventuality stage (the result stage) at some point two days before \(X_{Now}\) (the 'eXtended Now' interval, McCoard 1978), and requires that same eventuality to cover the neo-reichenbachian \(R\) interval (which turns out to be the speech time interval \(S\) in this case, i.e. \(X_{Now}\)). This, combined with the complex aspectuo-temporal semantics of the PC, accounts for the (86)-(87) contrast.

To put it short, if we call \(e_i\) the inner stage eventuality and \(e_R\) the result stage eventuality, *depuis* clearly imposes that \(e_i\) precedes \(X_{Now}\) while \(e_R\) overlaps with it in (86). This gives us figure (88) (note that the beginning of \(X_{Now}\) MUST coincide with that of \(e_R\): Yannig's absence started right before the \(X_{Now}\) interval; *depuis* defines the left boundary of the \(X_{Now}\) interval – which is equal to \(R\) in this case). The graphical representations of (87) given in (89) and (89)’ make it clear that (87) cannot receive any felicitous interpretation. (89) is out because it is not true that the beginning of Yannig's illness (which corresponds to the respective beginnings of both \(e_i\) and \(e_R\)) coincides with that of the \(X_{Now}\) interval (*depuis* no longer situates the eventuality on which it bears, namely \(e_R\), within the \(R = S = X_{Now}\) interval). And (89)’ is ruled out because \(e_i\) (the actual state of being sick) would still be going on in \(X_{Now}\) (thus clearly going against what little meaning we can ascribe to (87); (87) clearly implies that Yannig is no longer sick now. This must be a requirement of the double aspectuo-temporal semantics of the PC that the inner stage eventuality CANNOT overlap with \(X_{Now}\).22

(88) Yannig a quitté son bureau depuis deux jours.

\[\begin{array}{c}
e_i \\
\text{\(X_{Now}\)}
\end{array}\]

\[\begin{array}{c}
e_R \\
\text{\(X_{Now}\)}
\end{array}\]

\[\text{\(X_{Now}\)}\]

---

21 Indeed, atelic verbs have in common a fundamental property: they seem to have overlapping inner and result stages. Indeed, as soon as we can describe say the inner stage of a running or a being ill eventuality, then we can infer from it that the corresponding sentence in the perfect (or the *passé composé*) is true: \(Yannig\ courait \rightarrow Yannig\ a\ couru\).

22 See Caudal (2007a/b) for further details on the (87)(86) contrast.
(89) *Yannig a été malade depuis deux jours.

(89') *Yannig a été malade depuis deux jours.

(91) gives a SDRT representation of (90). The Present_Resultative_Transitional_IVP illocutionary viewpoint function ensures that the proper inferences are drawn at the semantics/pragmatics interface, while the (complex) aspectual viewpoint function Resultative_Perfective contributes directly to the compositional semantics of the discourse segment. (91') repeats the representation after the Resultative_Perfective function is applied to the stage structure of eat plus its arguments.

(90) Yannig a mangé sa crêpe (hier). ('Yannig ate his pancake (yesterday').)

(91)

\[
\begin{array}{l}
\pi : \\
\qquad e_I \quad e_R \quad u \quad v \quad t \\
\qquad \text{named}(u, \text{Yannig}) \quad \text{pancake}(v) \quad \text{hier}(t) \\
\qquad e_R < X\text{Now} \quad e_I < X\text{Now} \quad e_I \subset t \\
\qquad e : \text{Resultative_Perfective}(\text{eat}_{STS}, u, v) \\
\end{array}
\]

Present_Resultative_Transitional_IVP(\pi)

(91')

\[
\begin{array}{l}
\pi : \\
\qquad e_I \quad e_R \quad u \quad v \quad t \\
\qquad \text{named}(u, \text{Yannig}) \quad \text{pancake}(v) \quad \text{hier}(t) \\
\qquad e_R < X\text{Now} \quad e_I < X\text{Now} \quad e_I \subset t \\
\qquad e_I : \text{IStage}_{\text{eat}}(u, v) \quad K_I \\
\qquad e_R : \text{RStage}_{\text{eat}}(u, v) \quad K_S \\
\qquad \text{Conseq_Telic}(K_I, K_S) \\
\end{array}
\]

Present_Resultative_Transitional_IVP(\pi)

Crucially, (91') makes it clear that the compositional semantics of the represented sentence comprises both an IStage eventuality (e_I) and an RStage eventuality (e_R). Both stages are therefore available for discourse reasoning through the semantics/pragmatics interface. Their co-presence reflects what I called above transitions – this explains why Narration can be established between two sentences in the passé composé: they can both introduce transitions.
6 Making sense of aspectual constraints at the semantics/pragmatics interface: some considerations on tenses, entailments and implicatures

Given the SDRT 'toolbox' presented above, one might want to try and make sense of it without the framework within which it was couched – possibly with respect to other kinds of approaches to the semantics/pragmatics interface, for instance in the terms of a vanilla Gricean theory. The following issues, in particular, are worthwhile clarifying: What kind of entailments did the 'toolbox' resort to, either stated:

(i) as discourse relation specific axiom schemata/meaning postulate? OR
(ii) as (SDRT update) Glue Logic axioms? OR
(iii) as Glue Logic 'aspectual rules'? (these are associated with illocutionary viewpoints/IVPs)

A certain measure of clarification would be welcome for entailments (iii), which are not a 'SDRT-native' way of introducing aspectual constraints within the framework, and bear a resemblance to Gricean implicatures (either conventional or conversational, depending on the cases).

6.1 Implicatures etc.: a brief survey

Clarifications are all the more in order since the notion of implicatures is in itself a theoretical maze, whose configuration has received notable changes in the recent literature – particularly within Chris Pott's influential works. I will therefore rely on Potts's (2005) ontology of meaning gives to delineate the issues at stake. It involves four main types: conventional implicatures (either particularized or generalized, cf. Levinson, 1998), conversational implicatures, at-issue meanings, or presuppositions.

![Figure 4: An ontology of meanings (borrowed from Potts (2005:23))](image)

Starting from this ontology, how can one categorize the kind of aspectual entailments formulated in the above theory?

6.2 Categorizing the aspect-based discourse constraints

Let us begin with the entailments giving rise to discourse-level interpretative effects pertaining to the domain of aspect (i.e., IVP-related axioms within the LIP). What theoretical label should we ascribe to them? I must confess at this point that my own position has been rather changeable in this respect… Thus Caudal & Roussarie (2006) took the inference associated with rule (49) to be monotonic rather than non-monotonic in order to fit an important defining characteristics of conventional implicatures. And indeed, this inference does not seem to admit defaults: theoretically, it could have been blocked if the passé composé in post 12th century Old French had been subject to e.g., lexical constraints (corresponding to...
lexical remnants of its pre-12\textsuperscript{th} century uses). Certain verbs might not have allowed for (49) to hold, and have required a purely resultative interpretation for the PC. But since there is no evidence of the existence of such verbs, it is likely that (49) is monotonic.

To put it short, implicatures are apparently the best candidate for (ii) Glue Logic discourse-relation axioms and (iii) Glue Logic 'aspectual rules', owing to the pragmatic nature of those entailments, whereas discourse-relation schemata (i) should rather be connected to some kind of semantic entailment. But let's check the whole range of possibilities, for safety's sake...

- **Entailments that are not implicatures**:
  - At issue entailments: they are clearly out for (ii) Glue Logic axioms and (iii) Glue Logic rules, because of the role played e.g., by *Sequence* as an antecedent for (49) (and generally for whatever non-purely linguistic information is used to compute discourse relations within the LIP); but the case of (i) discourse relation-specific axiom schemata is less clear;
  - Presupposition: it seems to be entirely out; none of these entailments meet the requirements of classic tests for presuppositions; i.e. the inference of the inner stage in (49) can hardly survive the negation of a sentence in the perfect. In 12/13\textsuperscript{th} century French, the negation of a sentence in the perfect (e.g., 'Rollant est aleti', 'Roland has left') does not render true an equivalent sentence using an aorist (e.g., 'Rollant alat', 'Roland left').

- **Implicatures**:
  - Conversational implicatures: they are not a good match for at least two reasons:
    - (i) discourse relation-specific axioms are not defeasible and (iii) Glue Logic aspectual rules some to be at least not always defeasible;
    - (i), (ii) and (iii) are all language-dependent – this in itself is sufficient to rule out conversational maxims, and therefore to refuse to classify such axioms/rules as instances of conversational implicatures; however, there is a growing suspicion in the literature about the relevance of this language-independence requirement (cf. Bach 1999, Asher & Lascarides 2003, Kratzer 2003);
  - Conventional implicatures: owing to recent works in the field, most would agree now that conventional entailments (in the sense of Potts (2005)) are in fact an unlikely match for (ii) and (iii) because of non-monotonicity (no to mention the role of pragmatic factors); indeed, Potts (2005) suggests that conventional implicatures are best modeled as part of a (multi-dimensional) compositional semantics; maybe (i) fares better, because it is monotonic and partakes of the dynamic semantics of aspect – such axioms are indirectly triggered by aspectual forms.

According to Potts (2005:11), the division between so-called *conventional* implicatures (CVTIs), and so-called *conversational* implicatures (CVSIs) can be stated as follows: CVTIs are part of the conventional meaning of words, while CVTIs are commitments, and thus give rise to entailments. These commitments are made by the speaker of the utterance, (I quote) 'by virtue of the meaning of the words he chooses. CVTIs are logically and compositionally independent of what is 'said' (in the favored sense), i.e. independent of the at-issue entailments.

Under Potts' view, CVTIs are crucially 'comments upon a semantic core' (Potts, 2005:16); they consist primarily in so-called *supplements* (i.e., parentheticals, appositives etc.) and *expressives* (expressions reflecting the speaker's judgement). Therefore, they pertain to the compositional semantics, cannot be cancelled, and don't depend on the truth conditions of the at-issue proposition, as Potts demonstrates (cf. e.g. his *Lance Armstrong, an Arkansan, has won the 2003 Tour de France!* example).

All in all, this sounds very much like we've reached a deadlock, at least w.r.t. categorizing Glue Logic aspect-sensitive axioms (ii) and aspectual rules (iii). The kind of entailments by means of which e.g. interpretative expansion (iii) is achieved for tenses does not seem to pertain to the compositional semantics; much depends on contextual factors, which act very much like interpretative triggers. But at the
same time, interpretative expansion is dependent as well on linguistic forms. It feels like this kind of rule presents contradictory properties (i.e., they are both context-dependent and language-dependent), at least from a Gricean standpoint.

Yet there is evidence that so-called conversational implicatures are not language-independent; therefore we can expect to be able to make better sense of those entailments once the foundational issues of conversational implicature have been clarified. The field is far from mature; there is thus a sharp contrast between e.g. Potts' (2005) very conservative conception of conversational implicatures (pp. 26-27) and e.g. Asher & Lascarides (2003) more critical approach: they both use the same paradigm of examples, but with conflicting views and conclusions.

Thus, Potts (2005) claims that (92a) has similar CVSIs as (92b)-(92e), which are just some kind of variant – in short, Potts (2005) defends the usual Gricean claim that conversational implicatures are a by-product of contextual, language-independent factors. In sharp contrast, Asher & Lascarides (2003) observe that examples like (92a) and (92e) and examples (92b)-(92d) should be placed in separate categories – the former are complex speech acts (they are conventionalized as requests, since they are compatible with please) while the later are indirect speech acts (they reject please). They even go as far as claiming that an example like (92b) is not even a remote equivalent of (92a).

(92) a. Can you pass me the salt? (Potts 2005:26-27)
   b. Are you able to reach the salt?
   c. I could sure use the salt.
   d. My dish could use a salting.
   e. Could you send the salt my way?

In addition, it is quite obvious that even the indirect-speech acts (92b)-(92d) show some linguistic clues relating them to requests – notably the pervasive presence of modals. Then again, this suggests the existence of a connection between conversational implicatures…and linguistic form, contra Gricean orthodoxy.

As suggested in Asher & Lascarides (2003:29), another crucial point is that standard Gricean theories of (generalized) conversational implicatures have been construed without a logic of the interaction between beliefs, goals and discourse content. The SDRT has been precisely built up to achieve this. Asher & Lascarides (2003:29-30) suggest that the difference between the Neo-Gricean view and the SDRT view can be seen as one of information flow (cf. (93) vs. (94)) – SDRT tries to appeal to cognitive states (the most costly kind of reasoning) as late as possible, capitalizing first on more cost-effective discourse-level reasoning (based on content, rhetorical relations and their semantic consequences).

(93) **Gricean information flow**: content ⊨ semantic consequences ≈ cognitive states.
(94) **SDRT information flow**: content plus assumptions to which utterances are connected rhetorically ≈ particular rhetorical relations ⊨ semantic consequences ≈ cognitive states.

Therefore, in SDRT terms, so-called implicatures often arise as a consequence of discourse relations, and can be made dependent (at least indirectly) on linguistic factors. With its complex semantics/pragmatics interface and its discourse relations, SDRT offers a perfect theoretical environment where to develop a linguistic theory of pragmatics; SDRT makes it possible to flesh out 'Gricean monsters' such as the aspectual Glue Logic rules discussed above. In a sense, these are 'conventional conversational implicatures', since they seem to possess properties pertaining to the two categories.

It shouldn't come as a surprise that SDRT is so well suited to the analysis of the contextual interpretation of aspectuo-temporal categories – because aspectuo-temporal interpretation in SDRT is naturally viewed as deeply connected with larger discourse structure issues, at the cross roads between semantics and pragmatics.
6.3 A general issue: the SDRT toolbox vs. a Gricean approach

I believe that what I have called 'discursive distribution' is an objective feature of the semantics of tenses (more specifically, of how tenses behave at the semantics/pragmatics interface). It is clearly conventional, since it is subject to historical evolutions (see e.g. the evolution of the French *imparfait*, *passé simple* and *passé composé*).

These observations are confirmed by influential typological works about tense and aspect. See for instance Dahl's (2000) 'perfect questionnaire', which treats discourse structure as a defining characteristics of perfects (as well as for other tenses). Whether or not we view these phenomena through the lenses of SDRT discourse relations does not really matter: it cannot be disputed that the effects of tenses on discourse structure is part of their conventional content. And they cannot be mere pragmatic whims, since they're subject to historical and linguistic variations, therefore reflecting changes or differences in genuinely grammatical patterns.

And so long as Gricean-approaches do not provide an alternative explanation for these phenomena, SDRT obviously has an edge over them. However, so far (at least to the best of my knowledge), this kind of data hasn't received much attention in the Neo-Gricean literature – with a few exceptions of course; and one such exception will be discussed in the following section.

6.4 A case against *Exhaustification*: why SDRT still prevails…

I am going to illustrate further the general arguments put forth in favour of a SDRT approach by discussing an instance of a Gricean-style approach to temporal ordering within discourse. It perfectly illustrates the kind of strategy adopted within the revived Gricean program (see e.g. Blakemore & Carston (1999), Carston (2004), etc.) to treat the sort of discourse phenomena captured by discourse relations – and for which Neo-Gricean theories will rather resort to conversational maxims.

In a recent paper by E. Jasinskaja (cf. Jasinskaja 2004) the role and interest of discourse relations, particularly *Elaboration*, has been challenged. Jasinskaja (2004) put forth a Gricean account of so-called temporal encapsulation (a phenomenon modelled in SDRT using the *Elaboration* relation) via a species of conversational implicature which she call *Exhaustification*. Given a proposition $\phi$, *Exhaustification* adds the meaning that only $\phi$ – in other words, that no other proposition from a distinguished domain of quantification holds.

Jasinskaja’s (2004) proposal is based on the following contrast: while (95a) is a case of temporal encapsulation, (95b) is not. She defines the *Exhaustification* operator as in (96), where the restriction $Q \in D_{(E,t)}$ makes *Exhaustification* dependent on a set of alternative event properties $D_{(E,t)}$ relevant to the current Question under Discussion (QuD). This effectively handles irrelevant properties, and guaranties that *Exhaustification* does not apply to e.g. (95b), since the cooking event is irrelevant to the assignment fulfilling event, and vice versa (not so for (95a)). Put differently, *Exhaustification* says that there exists a (unique) event $e$ which has the property associated with the current QuD, and that any other event $e'$ verifying that property too must be part of $e$ (there is only one event $e$ which has this property $Q$; any other event is either part of $e$ or is irrelevant to the QuD).

(95) a. Alena was cooking raspberry jam. She was fulfilling Marina’s assignment.  
   $e_1$-cooking is part of $e_2$-fulfilling Marina’s assignment.  ($\text{Exhaustification holds}$)

b. Alena was cooking raspberry jam and fulfilling Marina’s assignment.  
   $e_1$-cooking is not part of $e_2$-fulfilling Marina’s assignment.  ($\text{Exhaustification does not hold}$)

(96) $\text{Exh}(P) = \exists e. P(e) \land \forall e' \forall Q \in D_{(E,t)} : Q(e') \rightarrow e' \leq e$

23 Quite a few prominent Neo-Gricean authors (e.g., Paul Portner or Craig Roberts, p.c.) doubt that discursive relations' (in the sense of SDRT) are truly linguistic mechanisms, but I believe that the distribution of tenses in discourse (in terms of interpretation and/or discourse structure) is robust evidence of the contrary.
And first sight, indeed, it seems that (96) is capable of capturing the event encapsulation phenomenon, without resorting to discourse relations. The *Exhaustification*-based analysis would be truly appealing if turned out to be sufficient to make the same range of predictions as an *Elaboration* based analysis, while saving us the trouble of introducing this discourse relation. In her conclusion, Jasinskaja goes even a step further and suggest one could maybe account for discourse structure without discourse relations at all.

But consider now the sharp contrast between the following discourses, respectively in the *passé simple* (PS) and in the *imparfait* (IMPF):

(97) Deux ans plus tard, en 1577, Ticho Brahé mit au point sa théorie du mouvement des comètes. Il releva scrupuleusement la trajectoire d'une comète dans le ciel de l'Europe, il compara ses relevés avec ceux de ses collègues européens et il constata la faible parallaxe. Il en conclut que ces astres voyageaient à une distance éloignée de la Terre au moins quatre fois la distance Terre Lune.

‘Two years later, in 1577, Ticho Brahe formulated-PS his theory of comet trajectories. He carefully observed-PS the trajectory of a comet in the European sky, then compared-PS his observations with those of European colleagues, and noted-PS the feable parallaxis. He concluded-PS from this that comets travelled-IMPF at a distance not greater that four times the Earth-Moon distance.’

(98) Deux ans plus tard, en 1577, Ticho Brahé mettait au point sa théorie du mouvement des comètes. Il relevait scrupuleusement la trajectoire d'une comète dans le ciel de l'Europe, il comparait ses relevés avec ceux de ses collègues européens et il constatait la faible parallaxe. Il en concluait que ces astres voyageaient à une distance éloignée de la Terre au moins quatre fois la distance Terre Lune.

(99) Deux ans plus tard, en 1577, Ticho Brahé mettait au point sa théorie du mouvement des comètes. Il relevait d'abord scrupuleusement la trajectoire d'une comète dans le ciel de l'Europe, puis il comparait ses relevés avec ceux de ses collègues européens et il constatait la faible parallaxe. Il en concluait que ces astres voyageaient à une distance éloignée de la Terre au moins quatre fois la distance Terre Lune.

The contrast between (98) and (99) reveals that event-encapsulation is ruled out with the *imparfait* in the absence of a temporal adverb(ial) marking the onset of a temporal succession pattern embedded within the elaborated event (cf. e.g. 'd'abord' ('at first') in (99)) – and that is not the case for the equivalent (97) in the *passé simple*: encapsulation is licensed even without such adverbs or adverbials. Clearly, reasoning about *Exhaustification* cannot make it possible to account for this contrast – it could even overgenerate by allowing event encapsulation where there shouldn’t be any. On the contrary, aspectual constraints on *Elaboration* could rather be implemented to explain this bit of data within the SDRT framework.

The only solution around this problem for the *Exhaustification*-based account would be to render the exhaustivity rule sensitive to the aspectual content of tenses. But then it would no longer qualify as a standard Neo-Gricean conversational implicature, since it would depend on grammatical factors. In short, the trouble with conversational implicatures is that they are language/grammar-independent, by definition. Or maybe this is a case of lexically/morphologically triggered implicature? But this brings us back to something that is definitely closer to the SDRT analysis defended here.

The following data (100)-(102) confirms that careful aspectual provisions should be made when establishing *Elaboration*. In its current state, the account presented here does not capture these facts, but it can be extended and revised in order to accommodate this new bit of data, by means of discourse rules/axioms:

(100) Tous les jours, il mangeait une banane. D'abord il enlevait la peau, puis il croquait dedans.

'Every day, he ate-IMPF a banana. First he peeled-IMPF it, then he took-IMPF a bite of it.'

*Elaboration* IFF temporal inclusion is related to the smallest interval
(101) Tous les jours, pendant dix ans, il mangea une banane au petit déjeuner. *D’abord il enleva la peau, puis il croqua dedans.
*Elaboration EVEN IF temporal inclusion is related to the largest OR to the smallest interval.

(102) Tous les jours, pendant dix ans, il mangea une banane au petit déjeuner. D’abord il enlevait la peau, puis il croquait dedans.
Elaboration IFF temporal inclusion is related to the smallest interval

It's quite obvious that we need rich formal mechanisms in order to control discourse structure via aspectual categories. Discourse relations offer us an ideal environment in order to do so. Conversational implicatures based on conversational maxims or even on weaker contextual (but non-linguistic) principles do not.

7 Conclusion

The theoretical and formal machinery exposed in this paper crucially aimed at making the best of an SDRT implementation of tenses at the semantics/pragmatics interface, so as (i) to fairly spread the burden of interpretation of tenses between these two components of the grammar and (ii) account for the impact of tense interpretation on discourse structure (and vice versa), via aspectually informed entailments, either through the very definition of discourse relations (both as LIC/content-level aspectual axioms, and as LIP aspectual preconditions) or through 'illocutionary viewpoint' axioms directly associated with tense interpretation within the LIP. It has been claimed that these aspectually informed entailments represent a lighter brand of linguistic convention – but linguistic convention nonetheless, of which the semantics/pragmatics interface per se must be the repository.

And indeed, all the aspectual axioms exposed in this paper are somehow part of what I take to be linguistic/grammatical discursive mechanisms. The illocutionary-viewpoint axioms here associated with tenses (see e.g. (49)) embody some form of tense-specific linguistic pragmatic convention. As proposed in Caudal & Vettes (2005), they really are the gateway to the semantic change of tenses. Conversely, purely contextual (non-grammatical) reasoning cannot account for such phenomena. I believe that the Gricean equation between context dependence and non-grammaticization is wrong (in the sense that context-dependent items are supposed to be subject to non-language specific, non-grammatical maxims); in the light of the data discussed in these pages, this is indeed a very questionable position. Tenses exhibit a range of context-sensitive interpretational effects (and/or impose constraints on discourse structure) which are clearly conventional, at least in a weak sense of convention – insofar as this clearly partakes of conventionally licensed uses of tenses, preparing the ground for a later evolution (cf. the case of the evolution of the French PC in Figure 3). There seems to exist a conventional layer of contextual, discourse-related phenomena which are not part of the compositional semantics, but yet remain connected to linguistic convention. Such phenomena equally partake from the semantics and the pragmatics, inasmuch as they involve both semantically contributed information and pragmatic information in order to derive discourse structure and to achieve contextual interpretation.

It is my belief that the formal 'toolbox' presented above can be successfully used to account for a wide number of typologically and diachronically similar aspectual phemonema. The ability of the SDRT framework to introduce aspect-sensitive (and more generally language-dependent) entailment mechanisms, either as rules or as axioms, is a very important asset, contra Neo-Gricean analyses based on language-independent principles. Maybe we should bear in mind the recent charge made by a number of authors against implicatures as language-independent principles (cf. Bach’s (1999) attacks against the very notion, and even Potts’ (2005) account of conventional implicatures as elements of the compositional semantics); indeed, it seems that much remains to be said with respect to the nature of implicatures.

This being said, a vast number of nagging issues remain open from a strictly SDRT point of view, of course. To make a quick list of them, they include notably the following:

(i) the nature of the Glue Logic rules about IVPs remains uncertain (to what extent are they (or are they not) 'implicature-like'?);
(ii) scaling-up such sets of axioms is becoming a crucial concern for SDRT: as we multiply GL rules, axiom schemata about specific discourse relations, lack of consistency is becoming a serious risk;

(iii) and of course, a host of interesting puzzles remain to be solved if we really intend to apply this SDRT toolbox cross-linguistically. One such puzzle I have in mind is the so-called Swedish inferential perfect; Rothstein (2005) suggests an entirely syntactic and semantic account, but maybe the semantics/pragmatics interface could be of some help again.

8 References

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