

In defense of the reference time

Daniel Altshuler^{a*} and Susanna Melkonian^b

^{a,b}Heinrich Heine University, Düsseldorf

1. Introduction

Intuitions about past-tensed narratives were instrumental in the development of a theory of tense and aspect in the 1980s, giving rise to Discourse Representation Theory (DRT; Kamp 1981). The key observation was that eventive sentences in past-tensed narratives ‘move the story forward’, whereas stative sentences do not. Consider the two discourses below, modified from Kamp, Genabith & Reyle 2011:

- (1) a. Josef turned around.
b. The man pulled his gun from his holster.
c. Josef took a step back.
- (2) a. Josef turned around.
b. The man had a gun in his holster.
c. Josef took a step back.

The only difference between (1) and (2) is the b-sentence. Whereas the former discourse contains the eventive VP *pulled a gun*, the latter discourse contains the stative VP *had a gun*. This impacts how we understand the ordering of the described eventualities. The discourse in (1) exemplifies *narrative progression*: the events are

* Email: daltshuler@gmail.com
smelkonian@phil.uni-duesseldorf.de

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understood to occur in the order in which they are described. The discourse in (2), however, is more complicated. Although we infer narrative progression in (2)a and (2)c, the state described in (2)b is understood to hold at the time that Josef turned around.

Such intuitions led to a theory of temporal anaphora that builds on Partee's (1973) idea of treating the past tense like a pronoun: the past tense seeks a salient time antecedent, called a *reference time*, prior to the speech time (cf. *she* seeks a salient individual antecedent that is female). In turn, the reference time is related to the time of the eventuality (event or state) by other mechanisms (e.g. the aspect). In other words, the reference time mediates between the speech time and the event time. This idea, first proposed by Reichenbach (1947), has often been referred to as the "two-dimensional" analysis of tense (Kamp 1999/2013).

Relating this analysis to the discourses above, the crux is that sentences with eventive VPs (or "eventive sentences") provide a reference time of the right kind, i.e. one that satisfies the presupposition of the past tense, whereas sentences with stative VPs do not provide a reference time (Hinrichs 1986, Partee 1984). For example, in (1)c, the reference time is provided by the eventive sentence in (1)b, namely some time in the past that is 'just after' the man pulled his gun from his holster.¹ As a result, we understand the gun pulling to take place after the turning around. In (2)c, however, the antecedent is some time in the past 'just after' Josef turned around because (2)a is the only other eventive sentence in the discourse and hence the only other sentence that could provide a

¹ As noted by Dowty (1986: 47) the 'time just after' is purposely vague; it is "determined by the hearer's understanding of the nature of events being described in a narrative, the overall degree of detail in which events are being described, and common knowledge about the usual temporal relationships among events...each successive sentence presents the very next event that transpires that is important enough to merit the speaker's describing it to the hearer, given the purpose of the narration."

reference time. As a result, we understand the taking a step back to take place after the turning around, but not necessarily after the man had a gun in his holster.

Research in AI in the 1980s pioneered by Jerry Hobbs also analyzed narrative discourse, but from a different point of view. Instead of explaining our intuitions about event ordering in terms of semantic rules, Hobbs (1985, 1990) appealed to commonsense reasoning with non-linguistic information. In particular, Hobbs extended David Hume’s principles of idea association to model how we interpret a given discourse; he assumed that there is a primitive class of rhetorical relations according to which a discourse is organized, i.e. a discourse is coherent because it is organized by particular rhetorical relations.²

For example, the Humean notion of *contiguity* is often characterized by the so-called “OCCASION relation” (Kehler 2006: 250), which is defined below, in (3). It has played a vital role in a variety of research projects within the cognitive sciences³ because it is seen as the backbone to any narrative (Hobbs 1990:Ch. 5).⁴

- (3) OCCASION(S_0, S_1):
- a. A change of state can be inferred from the assertion of S_0 , whose final state can be inferred from S_1
 - b. A change of state can be inferred from the assertion of S_1 , whose initial state can be inferred from S_0 (Hobbs 1990: 87).

To see the impact of the definition above, let us relate it to the discourse in (1). In particular, let’s suppose that (1)a corresponds to discourse segment S_0 and (1)b corresponds to discourse segment S_1 . In this case, we can say, following (3)a, that a change of state could be inferred from (1)a due to the telic predicate *turned around*,

² Hume famously wrote: “To me there appear to be only three principles of connection among ideas, namely Resemblance, Contiguity in time or place, and Cause or Effect” (Hume 1748).

³ See, e.g. Kehler 2002, Wolf & Gibson 2005, Altshuler 2012, Rhode & Horton 2014 and references therein.

⁴ A satisfactory analysis of *narrative discourse* is much more complex, however, involving a multitude of rhetorical relations (in addition to OCCASION). We consider some of these relations in the next section.

whose final state, i.e. Josef having change his physical location, can, in some sense, be ‘inferred’ from the man pulling his gun from his holster. For example, it’s natural to understand the man’s pulling his gun from his holster to be *contingent* on (and hence inferable from) Josef having turned around and thus posing a threat, possibly from following the convention of a duel.⁵ In contrast, one would be hard pressed to argue that (2)b is linked to (2)a via OCCASION because, given world knowledge reasoning, it’s hard to see how a man having a gun in his holster could be contingent on Josef’s turning around. Instead, (2)b is linked to (2)a by BACKGROUND (Lascarides & Asher 1993), whose temporal import is ‘overlap’ between two described eventualities.⁶

In sum, coherence-based theories like Hobbs’ derive the temporal ordering of events in narrative discourse by appealing to particular kinds of world knowledge reasoning, such as the kind encoded by OCCASION and BACKGROUND. This, according to Kehler (2002), allows for a much simpler analysis of the past tense: it constitutes a precedence relation between the speech time and the event time (ibid:191); there is no need for an intermediary notion of a *reference time* because narrative progression (or lack thereof) is an epiphenomenon of speakers seeking coherence in a given discourse.⁷

A similar conclusion was also reached by Lascarides & Asher (1993:437-38) who were the first to point out, based on the discourses below, that grammatically-based theories of narrative progression do not explain the backward movement of time in (4). Moreover, “they are unable to explain why the natural interpretations of [(5)a and (5)b]

⁵ Note that the clause in (3)a is sufficient to establish OCCASION between (1)a and (1)b. See Hobbs 1990 for examples which motivate the clause in (3)b and narrative sequences which blur the distinction between (3)a and (3)b, i.e. where OCCASION can be established by either clause.

⁶ Lascarides and Asher 1993 define BACKGROUND(S_0, S_1) as: The state described by S_0 is the ‘backdrop’ or circumstance under which an event described by S_1 occurred.

⁷ Kehler (2002) does, ultimately, conclude that the perfect requires the notion of a reference time. This, according to Kehler, is what makes the perfect different from all other tenses.

are different” (ibid). That is, it is surprising on, e.g. Partee’s analysis outlined above, that two eventive sentence in (4) don’t invoke narrative progression. Similarly, it is surprising that the stative sentence *The room was pitch dark* in (5)a triggers narrative progression, but the same stative sentence in (5)b does not.

(4) Max fell. John pushed him.

- (5) a. Max opened the door. The room was pitch dark.
b. Max switched off the light. The room was pitch dark.

An appeal to commonsense reasoning could, however, explain the data above according to Asher and Lascarides. For example, the second sentence in (4) is naturally understood to be an explanation of the first sentence (invoking the so-called EXPLANATION relation⁸), while (5)a and (5)b differ in that the first sentence of (5)a naturally invokes BACKGROUND, while the first sentence of (5)b invokes RESULT⁹, a relation that could be thought of in terms of Humean cause-effect.¹⁰

More recently, Bittner (2008, 2014) has attempted to defend the grammatical view of narrative progression, arguing based on a wide array of genetically unrelated languages with rich morphological marking that aspectual distinctions are, in fact, responsible for the understood temporal location of an eventuality. Moreover, she suggests that English verbs, which exemplify impoverished morphology, are underspecified for aspectual type, thereby making it extremely difficult to come up with meaningful generalizations about narratives in English. While Bittner does not characterize the alleged underspecification

⁸ Lascarides & Asher 1993 define EXPLANATION(S_0, S_1) as: The event described by S_1 explains why the event described by S_0 happened (perhaps by causing it).

⁹ Lascarides & Asher 1993 define RESULT(S_0, S_1) as: The event described by S_0 caused the event or state described by S_1 .

¹⁰ (5) could also be argued to exemplify OCCASION. However, Lascarides and Asher (1993) don’t consider this relation to be primitive. More recently, Asher and Lascarides (2003) treated OCCASION as a trigger for NARRATION, which is discussed in the next section.

in examples like (4)-(5)¹¹, her position is supported by Caenepeel's and Moens' (1994:10) observation that if we assume that EXPLANATION (or commonsense reasoning more generally) triggers backward movement of time for simple past sequences, viz. (4), then it is unclear why (6)a and (7)a are infelicitous, or at least worse than their b-counterparts:

- (6) a. ?Everyone laughed. Fred told a joke.
b. Fred told a joke. Everyone laughed.
- (7) a. ?The committee applauded. Niegel announced his promotion.
b. Niegel announced his promotion. The committee applauded.

Clearly, a salient causal link between someone telling a joke and people laughing and between someone's promotion being announced and people applauding is evident. Nevertheless, that does not make (6)a and (7)a felicitous.

The data above suggests that perhaps Bittner is right and that generalizations about narrative progression should not be based solely on English data.¹² To that end, we choose to consider narrative discourses from Russian and French, languages with explicit aspectual marking. Adopting the coherence-based approach to discourse interpretation advocated by Asher, Hobbs, Kehler, Lascarides and others, the aim of this squib is to provide new evidence in favor of a Partee-type meaning of the past tense, namely one that encodes a *reference time*. This aim is achieved as follows. In the next section, we argue that on the one hand, OCCASION is a necessary ingredient to model narrative discourse, but on the other hand, we also need a relation which is defined in purely temporal terms; something like Asher's and Lascarides' (2003) NARRATION. Subsequently, in §3, we show that the choice between these two relations is governed by various factors, such as the use of aspect and the presence (or lack thereof) of temporal

¹¹ See Kamp, Genabith & Reyle 2011 for a proposal.

¹² See Toosarvandani 2014 for more discussion of this point.

locating adverbials. In §4, we suggest that this observation warrants a semantic explanation that involves the notion of a *reference time*, and sketch out some ideas for what the explanation could be like, while remaining neutral about the particular formal implementation.

In sum, the methodology assumed in this squib is as follows. We look at narrative discourses of various kinds and consider which rhetorical relations adequately model the inferences that are invoked. Subsequently, we ask what in the grammar is responsible for triggering the rhetorical relations that we observe. After reaching a natural hypothesis, we conclude that only a particular kind of semantic analysis, namely one that involves the notion of a *reference time*, could explain why these grammatical forms should trigger the rhetorical relations that we observe. So, in essence, the methodology employed here starts from the discourse level and concludes with questions about form and meaning. We believe that this methodology is essential for explaining intuitions about the temporal location of eventualities. Moreover, by looking at Russian and French, we hope to advance Bittner's motto: *in order to better understand narrative discourse, study languages with rich morphology that encodes aspectual distinctions*.

2. OCCASION, NARRATION or both?

In the previous section, we saw how OCCASION plays a vital role in accounting for the contrasting inferences in (1)-(2). However, we also noted that narrative discourse is more complex than what is suggested by (1)-(2). One complication is that there appear to be discourses that exemplify narrative progression, yet the described events are not understood as being related via a contingency relationship involving changes of states. For example, consider the discourses below, in (8)-(10):

- (8) A man murdered Mitys. Shortly after, a statue of Mitys fell on the murderer, killing him instantly (Aristotle's *Poetics*, cited in Cumming 2010).
- (9) “That will be 72 cents”, the grocer said. “AAAAAAAAAAAAA!” Jack screamed, looking down to see a bee busy stinging him on the little finger (after Richard Brautigan, *Revenge of the Lawn*, Sam Cumming, p.c.).
- (10) A wave crashed down on Bob, ruining his new suit. “I’ll sue you for that,” said Bob. Another wave crashed down on him shortly thereafter, carrying off his bowler hat. (Sam Cumming, p.c.).

In (8), a man is described as killing another man and then being killed by a statue. Since statues are not the sorts of things that react to murders, the second killing cannot be contingent on the first. In (9), we understand that two speech acts—the grocer asking Jack to pay and Jack screaming—happened in temporal succession, but there is no understood contingency between them, e.g. we don’t infer that Jack was screaming at the grocer. Finally, in (10), we infer that a wave crashed after Bob playfully threatened the wave. Since waves are not the kind of things that react to threats, once again, there is no understood contingency between the two events.

If we conclude that there is no understood contingency between the events described in (8)-(10), then it seems far-fetched to account for the narrative progression in these discourses by appealing to OCCASION. But if not OCCASION, then what?¹³ One possibility is to adopt Lascarides’ and Asher’s (2003) NARRATION:

(11) NARRATION(S_1, S_2): the event described by S_1 follows an event described by S_2

In addition, following Cumming (2013), we will assume that a discourse is coherent if it addresses some *question under discussion* (QUD, Roberts 2012).¹⁴ For example, the

¹³ According to Jerry Hobbs (p.c.), (8) could be analyzed as a kind of parallel since both sentences describe a similar event, namely killing, and the agent and the patient of the two events is the same individual. Perhaps (10) could also be analyzed along these lines. (9), however, does not seem to involve any parallel.

¹⁴ This assumption is a departure from Asher & Lascarides’ (2003) proposal that discourses exemplifying NARRATION must also satisfy the so-called *common topic constraint*.

QUD in (8) is something like *Who killed who?* In (9), the QUD is something like *What happened in the store?* And in (10), the QUD is something like *What happened between Bob and the wave?* What all these QUDs have in common is that they are compatible with the temporal order imposed by NARRATION. In contrast, there is no reasonable QUD in (12) below that would also satisfy the temporal order imposed by NARRATION.

(12) At five o'clock, my car started and the rain stopped (Moens & Steedman 1988: 22).

A reasonable QUD such as *What happened at five?* would trigger PARALLEL (or perhaps CONTRAST)¹⁵ in (12), but crucially not NARRATION. As a result, there is no understood narrative progression.

Similarly, there is no possible QUD in (13) below that would satisfy the temporal order imposed by NARRATION. Unlike (12), however, (13) is incoherent because it arguably does not satisfy any rhetorical relation. Put differently, there is no reasonable QUD in (13).

(13) #Christ was born no later than 4 B.C. and today Fortuna won the match.

In sum, NARRATION seems to be helpful in analyzing those narrative discourses that do not exemplify OCCASION. A question that arises, however, is how exactly QUD is linked to NARRATION and other rhetorical relations. Could it be the case that a sufficient

¹⁵ While there is no consensus as to how PARALLEL and CONTRAST should be defined, most theories of discourse coherence agree that these relations are fundamental. Below, I provide Hobbs's (1990) definitions. See, e.g. Kehler 2002 and Asher & Lascarides 2003 for different renditions.

- (i) PARALLEL(S_0, S_1):
Infer $p(a_1, a_2, \dots)$ from the assertion of S_0 , and $p(b_1, b_2, \dots)$ from the assertion of S_1 , where a_i and b_i are similar for all i (ibid: 93).
- (ii) CONTRAST(S_0, S_1):
 - a. Infer $p(a)$ from the assertion of S_0 , and $\neg p(b)$ from the assertion of S_1 , where a and b are similar.
 - b. Infer $p(a)$ from the assertion of S_0 , and $\neg p(b)$ from the assertion of S_1 , where there is some property q such that $q(a)$ and $\neg q(b)$ (ibid: 9).

answer to this question would eliminate the need for OCCASION altogether? While no concrete answer to this question has been provided to the best of our knowledge, and none will be provided here, the next section will look at data that is directly relevant. We will first look at discourses suggesting that the Russian imperfective is incompatible with OCCASION. Then, we will see narratives with the Russian imperfective where NARRATION but not OCCASION(!) is exemplified. We will take these data as evidence that both relations are linguistically relevant and this will set the stage for us showing that *semantic* factors contribute to NARRATION, rather than OCCASION, being exemplified by a given discourse.

3. Aspect and temporal locating adverbials in past-tensed discourses

In this section we would like to show that both OCCASION and NARRATION are linguistically relevant. To do so, we would like to first consider discourses that describe two events that could, in principle, be related to one another in multiple ways. We show that using a particular aspect in Russian (i.e. perfective vs. imperfective) constrains the possible ways in which the event ordering could actually be understood.

Let's begin by considering a discourse that describes the following two events: An event of entering the castle and an event of reading a brochure about this castle. In principle, we could imagine the following ways in which these events could be related to form a coherent discourse: (a) reading a brochure about a castle set up the occasion for visiting it, (b) the castle was entered with the knowledge gained from having read the brochure, (c) the castle was entered while reading the brochure, and (d) the entering of the castle set up the occasion to read a brochure about it. Interestingly, the use of the

imperfective ('IPF') *čital* ('read') in (14) is compatible with the situations described in (a)-(c), but not in (d). To describe (d), the perfective ('PFV') *počital* is preferred.

- (14) *Dudkin za-še-l v zamok. On čita-l brošjuru ob ètom zamke.*
 Dudkin PFV-go-PST.3S into castle he read.IPF-PST.3S brochure about this castle
 'Dudkin entered the castle. 'He {had read/was reading} a brochure about this castle.'

Let's now turn to the discourse in (15), cited by Altshuler (2012: 86):

- (15) *Gruzinskaja storona ešče s utra zajavila, što*
 Georgian side even from morning announce.PFV-PST.3s-FEM that
peredača uže sostoja-l-a-s',
 exchange already take.place.PFV-PST.3S-FEM-RFL
 'The Georgians said in the morning that the exchange had already taken place,'
rossijskaja storona èto oprovergla-l-a.
 Russian side this deny.IPF-PST.3S-FEM
 'the Russians had denied this...' (Izvestija, 2002.10.04)

Here, we understand that the Russians denied that an exchange had taken place. The question relevant for the purposes here is: When is this denial understood to have taken place relative to the announcement made by the Georgians? World knowledge tells us that denying must take place after the claim that is being denied. However, with the imperfective verb *oproverglala* ('deny'), the denial is actually understood to be the general position that had been held by the Russians regardless of what the Georgians claimed. Put differently, the imperfective verb describes a habitual state that is not contingent on the Georgian claim. To describe a denial that is contingent on the Georgian claim, the perfective counterpart, *oprovergla*, would have to be used.

In sum, (14) is a case in which the described events could, in principle, be ordered in every possible way, and (15) is a case in which world knowledge reasoning biases narrative progression. However, in both discourses, narrative progression is not inferred when the imperfective is used.

Let us now consider a pair of discourses that force narrative progression. We start with (16), where the use of imperfective would lead to an infelicitous discourse:

- (16) *Muscina vo-še-l v <<White Hart>>. On byl v černom pidžake*
 Man PFV-go-PAST to White Hart He be.IPF-PST in black jacket
 ‘A man entered the White Hart. He wore a black jacket.’
Bill {^{OK}da-l/ #dava-l} emu bakal pivo.
 Bill give.PFV-PST give.IPF-PST him mug beer
 ‘Bill gave him a mug of beer.’ (after Kamp & Reyle 1993)

This discourse describes a man who entered a bar while wearing a black jacket. Subsequently, the discourse describes this man receiving a mug of beer. Given that people receive beer after they enter a bar (rather than before), narrative progression is forced (or heavily biased). Consequently, the imperfective *daval* (‘gave’) is not possible; the perfective *dal* must be used instead.

An analogous point could be made with respect to the discourse in (17) below:

- (17) *Dva goda spustja, v 1977 gody, amerikanskij geometr Robert Konnelli*
 Two years removed in 1977 year American geometrician Robert Connelli
po-stroi-l pervye primery izgibaemyx, mnogogrannikov
 PFV-build-PST.3S first examples flexible polyhedron
i tem samym {^{OK}oprovergl/ #oproverga-l} gipotezu Ejlera.
 and that same disprove.PFV.PST.3S disprove.IPF.PST.3S hypothesis Euler
 ‘Robert Connelli built the first flexible polyhedron, and thereby disproved Euler’s hypothesis.’ (N.P. Dolbilin, *Žemčužiny teorii mnogogrannikov*)

The phrase *i tem samym* (‘and thereby’) forces a contingency relationship between the polyhedron having been built by Connelli and the disproof of Euler’s hypothesis. Consequently, the imperfective verb *oproverglal* (‘disproved’) cannot be used to assert the disproof of Euler’s hypothesis; its perfective counterpart must be used instead.

Based on the discourses above, Altshuler (2012) proposes that the Russian imperfective is incompatible with OCCASION. While we agree with this hypothesis, it is important to see why a more general hypothesis fails, namely that the Russian

imperfective is incompatible with NARRATION and is only therefore incompatible with OCCASION.

Consider (18):

- (18) a. *Osen'ju 1888 godu Ul'janovu bylo razrešeno vernut'sja v Kazan'.*
Fall 1888 year Ul'janov was.IPF allowed return to Kazan
Zdes' on vposledstvii vstupil v odin iz marksistskix kružkov...
Here he subsequently joined.PFV in one from Marxist circles
'In the fall of 1888, Ul'yanov was allowed to return to Kazan. Here he subsequently joined one of the Marxist circles...'
- b. *V 1924 godu N.K. Krupskaja pisala v "Pravde":*
In 1924 year N.K. Krupskaja wrote.IPF in "Pravda"
"Plexanova, Vladimir Il'ič ljubil strastno..."
Plexanov Vladimir Ilich loved.IPF passionatly
'In 1924, N.K. Krupskaja wrote in "Pravda": "Vladimir Ilich loved Plexanov passionately.'

The discourse above is a snippet from a long narrative about Lenin's life. The part of the narrative in (18)a describes two subsequent events starting in 1888: Lenin's permission to return to Kazan and his subsequent joining one of the Marxist circles. The narrative then goes on to describe several other events in Lenin's life, leading to the end of a paragraph. The new paragraph opens with (18)b above, which describes an event that took place 36 years later, in 1924, when Lenin's wife, Krupskaja, wrote about Lenin in the newspaper *Pravda*. What's crucial for our purposes is the fact that the imperfective past tense verb *pisala* ('wrote') is used in a context where there is clear narrative progression. Given the temporal locating adverbial that begins (18)b, Krupskaja's writing about Lenin must be understood as occurring after the events described in (18)a.

Several comments are in order. To begin with, note that the writing event described in (18)b is not understood to be contingent on the events described in (18)a, even though the content of Krupskaja's writing, namely Lenin's love for Plexanov, is surely linked to the events described in (18)a. Therefore, saying that OCCASION relates Krupskaja's

writing to a previously mentioned event would be misleading. Rather, something like NARRATION is exemplified because the imperfective clause, along with the adverbial that modifies it, is simply used to assert that an event (i.e. writing) took place in 1924, after the other events. The QUD is something like *What happened in Lenin's life?*¹⁶

As noted in the previous section, much more needs to be said about how QUD is linked to the choice of a rhetorical relation, and NARRATION in particular.¹⁷ For our purposes, what is crucial to take away is three-fold: (a) past imperfectives are used in narrative discourse¹⁸, but (b) only when the narrative involves something like NARRATION rather than OCCASION and (c) it also involves a temporal locating adverbial. Based on (a) and (b), we conclude that the Russian imperfective is allergic to OCCASION, but welcomes NARRATION. This conclusion is supported by the fact that (17) and (18) are infelicitous with the imperfective precisely because contingency (which is the hallmark trigger of OCCASION) is forced.

We now turn to the observation in (c) and its relation to (a) and (b). In the next section, we argue that the notion of a *reference time* allows for a natural explanation for why the imperfective is allergic to OCCASION but not NARRATION.

4. In defense of the reference time

In what follows, we would like to advance the hypothesis that temporal locating adverbials license the use of the Russian imperfective in particular narrative progression

¹⁶ Based on this common topic, it's tempting to argue that a parallel is being established. This, however, seems unlikely given the definition of PARALLEL in fn. 14. In particular, note that the agent of the writing event described in (18)b is not Lenin but his wife.

¹⁷ With respect to (18), one relevant observation is that the writing event described in (18)b is not at-issue; the writing by Krupskaja serves as evidence for what Lenin's feelings towards Plexanov are like and these feelings are at issue. See Simons 2007 for an analysis of propositional attitude verbs as evidentials.

¹⁸ This observation was noted by Chvany (1985), though her discussion centers around the imperfective present, which is the form used in Russian for the historical present. This squib has nothing to say about this usage of the imperfective.

contexts, i.e. those discourses that exemplify NARRATION. This idea is, in part, motivated by the observation that it would be odd to utter (18)b above as a continuation of (18)a without the temporal locating adverbial *V 1924 godu* ('In 1924'). In addition, there is evidence for the hypothesis from French. It has often been observed that the imparfait is odd in narrative contexts (see e.g., Kamp & Rohrer 1983). For example the imparfait *pénétrait* ('entered') in (19) below is infelicitous due to the narrative progression.

- (19) #Maigret reprit la petite auto noire et il **pénétrait** dans la brasserie de la place de la République.
 'Maigret once more took the little black car and he entered the café at the Republic square.'

Interestingly, inserting a temporal locating adverbial, *quelques minutes plus tard* ('a few minutes later'), in the imparfait clause of (19) renders the discourse perfectly natural:

- (20) Maigret reprit la petite auto noire et, **quelques minutes plus tard**, il pénétrait dans la brasserie de la place de la République.
 'Maigret once more took the little black car and a few minutes later he entered the café at the Republic square' (Grønn 2008).

The use of the imparfait in (20) has been called "the imparfait narrative" (or "imparfait de rupture") and it has often been noted that it requires a temporal locating adverbial (often in fronted position). For example, Tasmowski (1985: 6) claims: "the development of the IR (= "imparfait de rupture") crucially depends on a temporal adverb at the beginning of the sentence, this adverb being in charge of introducing a new temporal moment in the text". Tasmowski cites Klum (1961), who compared how many times in a corpus the temporal locating adverbials appeared with the imparfait narrative. Klum suggested that in presence of temporal locating adverbials, the imparfait is often preferred to the passé simple. Kamp and Rohrer (1983: 258) provide the beginnings of an explanation for this observation when they write: "[...] Indeed when an imparfait

sentence is to refer to a time other than the reference point it must contain a temporal adverbial (which may take the form of a single adverbial, a prepositional phrase or a subordinate clause) to indicate that time.” One way to interpret this idea is that the imparfait naturally occurs without the presence of temporal adverbials, for example, when it’s embedded in a discourse and gets its reference time from surrounding context. In the presence of temporal adverbials, however, it is that adverbial that provides the temporal anchor, i.e. the reference time required by the imparfait.

This invites a compositional semantic analysis of the interaction between tense, aspect and temporal adverbials. Crucially, such an analysis must explain how this interaction constrains the structure of a discourse, i.e. whether OCCASION or NARRATION is inferred. In what follows, we would like to offer a suggestion for what this analysis could be like, while remaining neutral about the formal implementation. Crucial in this suggestion will be the notion of a *reference time*. In this way, we will come full circle. Recall that we started with Partee’s analysis, which appealed to reference times to explain narrative progression. Subsequently, we saw that coherence-based analyses can explain the same data without positing reference times. And now, the suggestion will be that past oriented narratives involving the imperfective aspect show that we need reference times to explain the interaction between tense, aspect and temporal adverbials and, in particular, how this interaction impacts the discourse structure. So, in essence, Partee’s analysis was on the right track, but for reasons that were not considered until now.

Here is the crux of our suggestion about how to model temporal meanings. Aspectual meaning is responsible for constraining the temporal location of a described eventuality relative to a time argument that is saturated by the tense. If there are no

temporal locating adverbials, the saturated time is left as a free variable; it functions like the aforementioned *reference time* used to define the past tense by Partee (1984; see discussion in §1); it could lead us to infer OCCASION if the particular relation between the reference time and eventuality time encoded by the aspect is compatible with OCCASION. With respect to the Russian imperfective, what we would like to say, then, is that its semantics imposes a relation between the reference time and eventuality time that is in direct conflict with OCCASION (as defined in §1).¹⁹

Now, if there is a temporal locating adverbial present, then the time left free by the tense—which can then function as a reference time—is existentially bound by the adverbial. In other words, temporal locating adverbials are devices of anaphoric closure because they prevent the otherwise free time variable from getting its value from the context.

One question that comes up for this toy analysis is why the presence of temporal adverbials often leads us to infer NARRATION rather than OCCASION in narrative discourse. One possible hypothesis, pursued in recent work (Altshuler & Melkonian 2014) is that temporal adverbials introduce a reference time which establishes a temporal gap between two events *e* and *e'* that is inconsistent with *e* being contingent on *e'* (see Dowty 1986 for a related idea). Therefore, OCCASION is often not exemplified in narrative segments that contain temporal adverbials.

¹⁹ Altshuler (2012) shows how this can be formally implemented. He proposes that the Russian imperfective denotes a function from a set of events denoted by the VP that it combines with to a set of VP-event parts. The consequent states of these event parts are related to a temporal coordinate that is specified by the discourse context; it functions similar to Partee's *reference time* discussed at the outset with one key difference: the reference time corresponds to the run time of salient consequent state previously introduced into the discourse context (cf. Webber 1988, Bittner 2008, 2014). Now, recall from §1 that OCCASION is defined in terms of salient (final and initial) states. Altshuler's idea is that the semantics of the Russian imperfective rules out OCCASION because the particular relation that it imposes (between the consequent state that it describes and the salient consequent state introduced into the discourse context) is in direct conflict with the state ordering in the definition of OCCASION.

This idea is nicely illustrated by the aforementioned discourse in (18). Recall that the temporal adverbial in (18)b is used to open the beginning of a paragraph. We believe that the temporal adverbial is especially well suited here because it allows Krupskaja's writing in "Pravda" to stand after a large enough temporal gap such that we could further infer that there were intermediary events not mentioned in the discourse that Krupskaja's writing in "Pravda" was contingent upon. As noted above, we suggest to model this idea as anaphoric closure by the adverbial. Without this anaphoric closure, the hearer would attempt to establish a contingency relationship directly, by picking out reference times established in the local context. However, such a relationship is not warranted given the facts described in the discourse, which is why (18)b is odd without an adverbial.

We end this section by noting that there are temporal adverbials which are not devices of anaphoric closure. That is, they do not provide a reference time because they are "discourse transparent". As illustrated by Altshuler (2014), *that same day* is an adverbial of this kind. Altshuler observed that adding this adverbial to a narrative discourse does not alter the narrative progression—the adverbial is, as it were, 'transparent to the progress'. Consider, for example the discourse in (21) below: specifying that the hiring took place on the same day as the house cleaning does not block the additional inference that the hiring took place after the house cleaning. Crucially, (21) makes no claim about how much temporal distance there is between the house cleaning and the hiring, although the distance is understood to be relatively short (see fn. 1).

- (21) a. On May 12, 1984, Sue gave Fido a bath and cleaned our house.
 b. **That same day**, my wife hired her and gave her a check for one month in advance.

The discourse transparency that we see in (21) can be replicated with related temporal adverbials and in non-narrative discourse contexts. Consider (22)b below, which differs from (21)b in containing the pluperfect (rather than the simple past). As a result, we understand that the hiring took place *prior* to the house cleaning. Crucially, this inference is present regardless of whether *that same month* and *that very month* are used. That is, these adverbials are transparent to the narrative regression.

- (22) a. Some months ago, Sue gave Fido a bath and cleaned our house.
 b. (**That same month/That very month**) my wife had hired her and had given her a check for one month in advance.

In (23) below there is no order that the events in (23)b,c are understood to have occurred in (though they are understood to precede the event described in (23)a). Such is the case whether or not *that same week* or *that very week* are present in (23)c. That is, specifying that the events described in (23)b,c all took place during the same week does not provide any new information that is not already inferred without *that same week* or *that very week*.

- (23) a. Bill will move next week.
 b. Last week, his house burned down.
 c. (**That same week/That very week**) he divorced Sue and he was fired.

In sum, what distinguishes an adverbial like *that same day* from an adverbial like *in 1924* is that the time described by the former always preserves the temporal structure of a discourse, i.e. it is *transparent* to the independent rules that account for the temporal structure of a given discourse. Following Altshuler 2014, this can be modeled on the toy analysis by saying that a distinguishing property between temporal adverbials is whether or not they introduce a reference time. Temporal adverbials like *in 1924* clearly do, and this impacts the structure of a discourse, mediated by tense and aspect. Adverbials like

that same day, however, do not introduce a reference time, thereby preserving the discourse structure that has been constrained by the tense and aspect.

A prediction of this analysis is that in contingency contexts that trigger OCCASION, the presence of an adverb like *that same day* should not license the use the imperfective (unlike the presence of an adverb like *in 1924*). This prediction is certainly borne out in the Lenin discourse in (18). If we were to replace *v 1924 godu* in (18)b with *v tot že samyj den'* ('that same day'), the discourse would be odd; the perfective form of *pisala* ('write'), namely *napisala*, would be preferred.

5. Conclusion

We hope that the toy analysis developed in the previous section provides a glimpse of what a formal implementation of the data considered in this squib could be like. The contribution should be thought of as providing some constraints on whatever formal implementation is chosen. We acknowledge that we have not showed how, exactly, grammatical components such as tense, aspect and temporal adverbials interact with pragmatic principles such as OCCASION or NARRATION. Rather, we have provided an argument, involving empirical evidence, that there must be such an interaction and argued that the notion of *reference time* is necessary to make sense of it.

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