

A Reichenbachian Account of the Interaction of the Present Perfect with Temporal Adverbials*

Janet Hitzeman

University of Edinburgh

One puzzling aspect of the present perfect is that temporal adverbials are sometimes acceptable in a present perfect sentence and sometimes not, as illustrated by the examples below:

- (1) a. Martha has lived in Boston for five years.
b. For five years Martha has lived in Boston.
- (2) a. Chris has left at midnight.
b. #At midnight Chris has left.
- (3) a. John has been in the bathtub until noon.
b. #Until noon John has been in the bathtub.

The sentences in (1) are acceptable whether the adverbial is in initial or final position. In contrast, there are acceptable readings of (2) and (3) when the adverbial is in final position as in the (a) sentences, but not when it is in initial position as in the (b) sentences. The acceptable readings of (2a) and (3a) can be paraphrased as below:

- (2') a. Chris has left at midnight before.
- (3') a. John has been in the bathtub until noon before.

I will argue that there is a straightforward explanation for the interaction of the present perfect with adverbials of the form [P NP] based on Reichenbach's [1947]

*Many thanks to Peter Laserson, Massimo Poesio and Greg Carlson for their comments. This work was supported in part by the European Commission's programme on *Linguistic Research and Engineering* through project LRE-61-062, "Towards a declarative theory of discourse."

treatment of tense, and that this explanation can be extended to give a uniform treatment of the interaction of temporal adverbials with all tenses. Specifically, I will argue that a sentence containing a temporal adverbial is ambiguous in any tense, but that in the present perfect certain readings are ruled out because of an interaction between tense and time deixis. I will end by considering three alternative proposals for treating this ambiguity, namely that the adverbial is ambiguous [Dowty, 1979], that it is an effect of the perfect [Kamp and Reyle, 1993] and that it is an effect of the syntax-semantics interface [Hitzeman, 1993].

Reichenbach's treatment of tense

Reichenbach proposes to represent tense in terms of temporal relations between three time points: the point of event E (the time at which the event occurs), the point of speech S (the time at which the sentence is spoken), and the point of reference R . In the past perfect sentence below, for example, E is the time at which John's boss asks him to phone in, S is the time at which the sentence was spoken, and R is the time from which the event of John's boss asking him to phone in is viewed, namely the time that John picks up the phone:

- (4) John picked up the phone. His boss had asked him to phone in.

The function of the past perfect here is to situate the event of asking prior to the event of John's picking up the phone, which, in turn, is prior to speech time. In contrast, in the simple past sentence of (4) the eventuality of John's picking up the phone precedes S but the time from which the event is viewed, R , is considered to be simultaneous with E . The translations proposed by Reichenbach for the tenses of English are below, where "X_Y" means that X precedes Y, and "X,Y" means that X and Y are simultaneous:¹

- (5) Simple past: R,E_S
 Simple future: S,R_E
 Simple present: S,R,E
 Present perfect: E_S,R
 Past perfect: E_R_S
 Future perfect: S_E_R

Explaining the present perfect data

It has often been noted that sentences in the present perfect with a temporal *for*-adverbial are ambiguous (See [Dowty, 1979, Kamp and Reyle, 1993] and many others), and this ambiguity is apparent in the past perfect and future perfect as well:

- (6) a. Martha has lived in Boston for five years.
 b. Martha had lived in Boston for five years.
 c. Martha will have lived in Boston for five years.

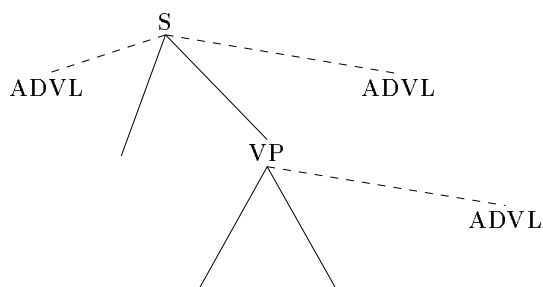
¹Reichenbach later adds to this set of translations in part to deal with the effects of adverb modification, but I will discuss here only his initial, classic analysis.

Each of the sentences in (6) has one reading in which there was some five-year interval prior to R during which Martha lived in Boston and another reading in which Martha lives in Boston at R and has done so for the five years preceding R. (Recall that in the present perfect $R = S$, so an equivalent description for the present perfect example is that there is one reading in which there is some five-year interval prior to S during which Martha lived in Boston and another reading in which Martha lives in Boston at S and has done so for the five years preceding S.) The former reading is unavailable when the adverbial is in initial position, as in (7):

- (7) a. For five years Martha has lived in Boston.
 b. For five years Martha had lived in Boston.
 c. For five years Martha will have lived in Boston.

The only reading possible in these examples is the one in which Martha still lives in Boston at R. I will refer to this as the “R-dependent” reading because R plays a greater role in determining the time E than in the former reading. More specifically, in each reading of a sentence with a temporal adverbial the points E, S and R must follow the constraint observed by Reichenbach for the tense of that sentence, but in the R-dependent reading the time E has an additional constraint $P(E,R)$ placed on it which enforces a particular temporal relationship between E and R. For example, in each of the examples in (7) Reichenbach’s system imposes the constraint that $E < R$ and $P(E,R)$ imposes the additional constraint $E \supset C R$.² The most specific constraint $P(E,R)$ is $E = R$.

The loss of one reading when the adverbial is in initial position can be explained in terms of the syntactic position of the adverbial. In [Hitzeman, 1993] I use tests from Reinhart [1983] for the syntactic position of PPs to argue that the R-dependent reading appears when the adverbial syntactically adjoins at sentence-level, and the other reading appears when the adverbial attaches at VP-level. (For lack of space, I will not discuss these tests here.) The following is an illustration of the possible positions of an adverbial:



A sentence-level adverbial may appear in initial or final position, explaining why the R-dependent reading appears whether the adverbial is in initial or final position. A VP-level adverbial should be able to appear in final position or in the Aux range, but

²Read “E abuts R.”

phrases don't appear in the Aux range in English, so the adverbial only appears in final position. This explains why the other reading is only available when the adverbial is in final position.

With a temporal *for*-phrase, the present perfect, past perfect and future perfect act uniformly, having two readings, one of which is lost when the adverbial is in initial position. Unlike the past perfect and future perfect, however, a present perfect sentence has only one reading with an *at*-phrase or an *until*-phrase. Compare the examples below:

- (8) a. Chris has left at midnight.
 b. #At midnight Chris has left.
- (9) a. John has been in the bathtub until noon.
 b. #Until noon John has been in the bathtub.
- (8') a. Chris had/will have left at midnight.
 b. At midnight Chris had/will have left.
- (9') a. John had/will have been in the bathtub until noon.
 b. Until noon John had/will have been in the bathtub.

This asymmetry can be explained in terms of time deixis and its interaction with temporal expressions and Reichenbach's treatment of tense. Consider that the R-dependent reading is the only possible one when the adverbial is in initial position as in (7), and that in the R-dependent reading E ends at R. In the present perfect, because $R = S$, we can also say that in the R-dependent reading E ends at S. Next, consider that, pragmatically, *midnight* and *noon* cannot be used to refer to S, as in *Let's go to lunch at noon* spoken at noon; the indexical *now* must be used. Therefore, in present perfect the R-dependent reading will be ruled out if the NP object of the adverbial is an expression like *midnight*. Sentence (8a) can mean that Chris has left at midnight on some past occasion but the reading in which *midnight* = $R = S$ is ruled out because *midnight* cannot be used to refer to S. Since the latter reading is the only one available when the adverbial is in initial position, (8b) is ruled out. The *until* phrase in sentence (9a) indicates that John was in the bathtub for an interval of time, but the NP *noon* marks the end of that interval, and when the adverbial is in initial position as in (9b) the reading in which *noon* = $R = S$ is forced, ruling the sentence out. The *for*-phrase in sentences (6) and (7a) is unproblematic because it is pragmatically possible for the phrase *five years* to refer to an interval that ends at S. Sentence (6a) has two readings, as predicted.

As further evidence that present perfect sentences with this type of adverbial are indeed ambiguous and the problem for present perfect sentences with temporal adverbials is due to time deixis, consider that acceptable sentences can be formed with NPs such as *1989*, which can be referred to "by name" when they express an ongoing time. For example, (10) is acceptable when spoken during 1989:

- (10) In 1989 John has been repeatedly late to practice.

The simple future and the simple past

The ambiguity discussed above is also present in a simple past or simple future sentence, such as (11):

(11) Martha will be in her office for an hour.

Sentence (11) has a reading in which Martha will be in her office for some unspecified hour in the future and an R-dependent reading in which Martha will be in her office for the hour beginning at R (which is equivalent to S in the simple future tense). The former reading is lost when the adverbial is in initial position, as in (12):

(12) For an hour Martha will be in her office.

The following examples provide further evidence that the two readings are present:

- (13) a. Martha will be in her office for an hour one day next week.
 b. #For an hour Martha will be in her office one day next week.

The phrase *one day next week* rules out the reading in which the hour that Martha is in her office begins at R (=S), so the only reading possible is the one in which Martha will be in her office for some unspecified hour in the future. The awkwardness of (13b) with this phrase shows that this reading is not possible when the *for*-adverbial is in initial position.

One difference between the R-dependent reading for the simple future and those we have seen for the perfect tenses is that in the R-dependent reading of (12) E begins at R, while in the R-dependent readings in (7) E ends at R. Note, however, that the generalisation still holds that there are two readings, one which is lost when the adverbial is in initial position, and one in which R plays a greater role in determining the time E.

In the simple past, both readings are available for all adverbials when in final position:

(14) Martha was in her office for an hour.

The reader has a right to be skeptical here, not only because the two readings are hard to detect, but also because in the treatment discussed so far the two readings are indistinguishable: If the simple past follows the pattern of the other tenses it will have one reading in which the time E stands in whatever temporal relationship with R that is specified by Reichenbach's analysis, and another reading in which both this constraint and the additional constraint P(E,R) hold. However, Reichenbach assigns the simple past the analysis $E = R$, and, as it is not possible to have a more specific constraint P(E,R), the analysis we have developed so far predicts that if there are two readings they will be the same.

However, the tests used above for the simple future show that there are indeed two distinct readings. We have observed that in the other tenses there are two readings in the simple past tense when the adverbial is in final position and one when it is in initial position. Both readings are constrained by Reichenbach's observation that R,E_S, and the sentence-level reading has an additional constraint. The phrase *one day next week* that we used as a test in (13) showed that when the adverbial is in final position there is a reading in which E can be moved about on the timeline as long as it stays within Reichenbach's constraints, while when the adverbial is in initial position the position of E is more tightly constrained. Similarly, in the simple past examples below the acceptability of the phrase *once* when the adverbial is in final position and its unacceptability when the adverbial is in initial position show that when the adverbial is in initial position a more specific constraint on E holds:

- (15) a. Martha was in her office for an hour once.
 b. #For an hour Martha was in her office once.

There is an acceptable reading, subject to this more specific constraint, when the adverbial is in initial position:

- (16) For an hour Martha was in her office.

We can account for the ambiguity in the simple past tense by refining the constraint P so that not only does it constrain the relative positions of E and R, but so that it also forces R to be taken from the temporal context created as the narrative progresses. Kamp [1979], Hinrichs [1981], and Partee [1984] note that in two consecutive eventive sentences such as (17), the second event is understood as occurring (just) after the first:

- (17) Martha went to her office. She sat down at the desk.

A simple view of this narrative progression phenomenon is that the first event has reference time R_1 and there is a time R_2 just after R_1 which is the reference time for the second event. We can make the generalisation that in the simple past the R-dependent reading – the only one available when the adverbial is in initial position – must follow this pattern of narrative progression, while the other reading need not. For example, in the text in (18) narrative progression is followed and the text is acceptable, while the texts in (19) are only acceptable with the adverbial in final position:

- (18) Martha went to the university. For an hour she was in her office.
 (19) a. Martha went to the university. #For an hour she was in her office earlier that day.
 b. Martha went to the university. She was in her office for an hour earlier that day.

The interpretation that the narrative is progressing is also available in the past perfect, where again we see that in the R-dependent reading R must be chosen so that it follows

the progression of the events, e.g., in (20) *an hour* must refer to the hour (just) after Martha arrives at the university:³

- (20) Martha had gone to the university. For an hour she had been in her office.
 (21) a. Martha had gone to the university. #For an hour she had been in her office earlier that day.
 b. Martha had gone to the university. She had been in her office for an hour earlier that day.

Three proposals

In sum, a sentence with a temporal adverbial of the form [P NP] has one reading in which the time E stands in the temporal relationship with R specified by Reichenbach's analysis, and another reading in which both Reichenbach's constraint and P(E,R) hold. The former reading appears when the adverbial is syntactically adjoined at VP-level and the latter when it is adjoined at sentence-level. The latter, R-dependent reading can take many forms: With the perfect examples in (7) E ends at R. With the simple future example in (12) E begins at R. With the simple past example in (16) E = R, and this R must be the R of narrative progression. I'll now consider three proposals concerning how this ambiguity can be explained.

1. Adverbials are ambiguous

Dowty [1979] proposes an analysis of temporal adverbials in Montague Grammar [Montague, 1973]. He begins by giving a translation for *for* which indicates that the eventuality expressed by a sentence has a duration expressed by the NP object of the *for*-phrase. This gives sentence (22a) the translation in (22b):

- (22) a. John slept for an hour.
 b. $\exists t_1[\text{PAST}(t_1) \wedge \text{an-hour}'(t_1) \wedge \forall t_2[t_2 \subseteq t_1 \rightarrow \text{AT}(t_2, \text{sleep}'(j))]]$

Translation (22b) states that there is a one-hour interval t_1 in the past and that for all subintervals t_2 of t_1 (including t_1 itself) it is true that John sleeps.

Dowty points out that the reading described by his translation for *for* is not the only reading that a sentence with a *for*-phrase can have, however, and gives examples such as (23), below:

- (23) Mary has lived in Amsterdam for three years.

Sentence (23) has two readings, as we have discussed above. Observing this ambiguity, Dowty proposes that *for*-phrases (as well as *since*- and *in*-phrases, which also

³In tenses other than the past and past perfect the narrative progression phenomenon is not strong, so this effect is not observable.

exhibit two readings, he observes) are ambiguous, and introduces an additional translation for *for* which captures the R-dependent reading.⁴

Dowty then notes the following:

The tactic of appealing to a double categorisation of *for*-adverbials admittedly looks rather ad hoc. But let it be noted that this tactic (or an equivalent one) is needed for other adverbials as well (p. 345-6).

He gives the example below, which is ambiguous between a reading in which it was taking John five minutes to solve the puzzle and one that can be paraphrased by *Five minutes later, John was solving the puzzle*:

(24) John was solving the puzzle in five minutes.

This approach adequately explains the ambiguity, but it has the disadvantage of being uneconomical.

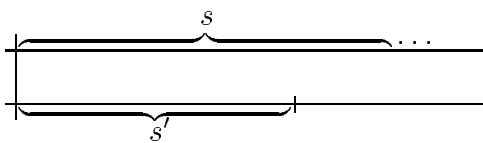
2. The perfect creates the ambiguity

A second proposal, made by Kamp & Reyle [1993], is that the ambiguity of sentences such as (25) is due to an effect of the perfect:

(25) Mary has lived in Amsterdam for three years.

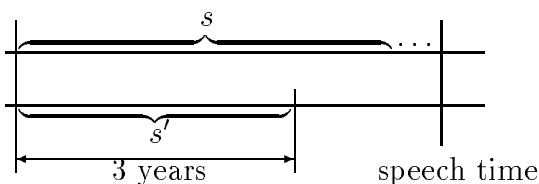
In Discourse Representation Theory [Kamp 1981], the eventuality expressed by a sentence is introduced into the discourse. Kamp & Reyle claim that the perfect additionally introduces the result state of the eventuality into the discourse. The result state of an event begins when that event ends, but the result state of a state begins as soon as that state begins. For example, as soon as the state s' of Mary living in Amsterdam begins, the result state s in which Mary has lived in Amsterdam begins. This can be illustrated as in (26):

(26)



The reading of (25) in which Mary lived in Amsterdam for some three-year interval in the past can then be illustrated as in (27):

(27)



⁴More precisely, Dowty uses the notion of the “extended now.” See McCoard [1978] or Dowty [1979], pp. 341-2 for details.

For R-dependent reading, Kamp & Reyle claim that the *for*-phrase "...combines directly with the perfect (p. 580)." They continue:

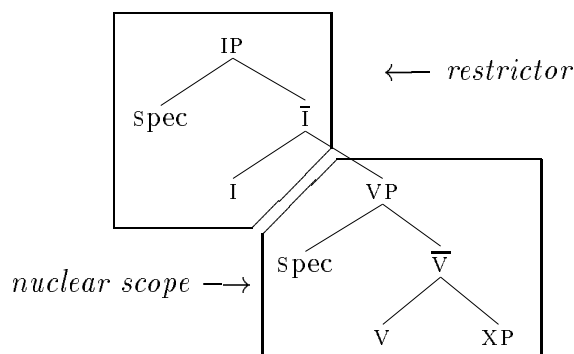
The semantics corresponding to this syntactic structure should be something like this: the perfect describes the result state s as starting at the beginning of the underlying state s' and as lasting for as long as three years, with the proviso that s' has not yet come to an end. As s and s' are concurrent in this case, it is hard to tell whether the *for*-phrase should be seen as characterising s or s' . However, we know of no case where a *for*-phrase can be used as characterising the result state described by a perfect. So we assume that again, as in our analysis of the first reading..., *for three hours* [sic] acts as a characterisation of s' (pp. 580-1).

It would be convenient for purposes of explaining the ambiguity if it could be claimed that the *for*-phrase can either describe the duration of the eventuality or can combine with the perfect to describe the duration of the result state introduced by the perfect. But Kamp & Reyle realize that this cannot be the case, since this would wrongly predict that the sentence *Mary has eaten for half an hour* would have a reading in which Mary ate half an hour ago and therefore, for half an hour, has been in the state of having eaten. They conclude that the *for*-phrase must describe the duration of the eventuality s' in both readings. However, this is the same analysis illustrated in (27) except for the proviso that s' has not come to an end at speech time. Their solution, therefore, is that the perfect gives two readings which are identical except that in one of them the eventuality s' hasn't yet ended at speech time.

The problem of giving a semantics for this proviso, which is a difficult matter in itself, is complicated by the fact that the ambiguity appears in the simple tenses as well as in the perfect tenses, as I have argued. As a result, the source of the proviso must be reconsidered.

3. The ambiguity arises in the syntax-semantics interface

A third approach, given in [Hitzeman, 1993], explains the ambiguity without assuming that adverbials are ambiguous by employing Diesing's [1992] Mapping Hypothesis. Diesing proposes that there is a mapping procedure that divides the syntactic tree (at the level of LF in languages such as English and at the level of S-structure in languages such as Dutch) into two parts which correspond to two different parts of the semantic representation, and illustrates the syntactic division as follows:



In the transition from syntax to semantics, items in the IP area are treated differently from those in the VP area: when an operator such as the generic operator is present, items in the IP area are mapped into the restrictor clause of that operator and items in the VP area are mapped into the nuclear scope. When no operator is present, items in the IP area are interpreted as specific and items in the VP area are interpreted as nonspecific. This split can be treated in Discourse Representation Theory by means of rules which treat higher and lower information differently.⁵

Diesing gives quite a bit of evidence for the tree-splitting operation, including Reuland's [1988] observations concerning Dutch subjects and Enç's [1991] observations concerning Turkish objects. The following examples are from Reuland:

- (29) a. Fred denkt dat [_{IP} twee koeien op het dak liggen].
 Fred thinks that two cows on the roof lie.
 'Fred thinks that two (specific) cows are lying on the roof.'
- b. Fred denkt dat [_{IP} er [_{VP} twee koeien op het dak liggen]].
 Fred thinks that there two cows on the roof lie
 'Fred thinks that there are two cows lying on the roof.'

According to Reuland, when the phrase *twee koeien* is in subject position as in (29a), the interpretation is that these are two specific cows. In (29b), where *er* is in subject position and *twee koeien* is within the VP, the two cows are interpreted as nonspecific cows. Given Diesing's assumption that the tree-splitting operation occurs at S-structure in Dutch, these data provide additional evidence that VP-internal material is interpreted as nonspecific, while VP-external material is interpreted as specific.

According to Enç [1991], Turkish distinguishes between NPs that are interpreted as specific and those that are not by means of morphological case marking. Diesing discusses the following examples from Enç:

⁵See Hitzeman [1993] for one such set of DRS construction rules.

- (30) a. Ali bir kitab-i aldı.
 Ali one book-ACC bought
 ‘A book is such that Ali bought it.’
 b. Ali bir kitap aldı.
 Ali one book bought
 ‘Ali bought some book or other.’

In (30a) the object *kitab* is marked with accusative case and can only have a specific reading. The object in (30b) is unmarked, and can only have a nonspecific reading. Diesing notes that this is in accord with her claim: material in the VP is interpreted as nonspecific unless otherwise specified by the morphological case marking. As further evidence, Diesing points out that there are unambiguously strong determiners in Turkish, and when they appear within the VP their objects are obligatorily marked with accusative case:

- (31) a. Ali her kitab-i okudu.
 Ali every book-ACC read.
 ‘Ali read every book.’
 b. *Ali her kitap okudu.

Diesing’s proposal can be extended to account for the different readings of temporal adverbials, given our observation that one reading appears when the adverbial is attached at sentence-level (i.e., IP-level) and another reading when the adverbial is attached at VP-level. The parallel to Diesing’s specific/nonspecific readings is this: When the NP is in the IP portion of the tree it must be interpreted as referring to something specific, i.e., something in the context. When the adverbial is attached in that same area the time of the eventuality must be interpreted with respect to the contextually determined time R. If we adopt Diesing’s proposal, we will have a unified analysis of each temporal adverbial and the difference between the two readings will be attributed to a mapping procedure which interprets IP material as specific and VP material as nonspecific.

An advantage of Diesing’s proposal is that it explains apparent exceptions to the generalisation that only the R-dependent reading is available when the adverbial is in initial position. Consider that a sentence with an *in*-adverbial such as (32) has two readings:

- (32) John will construct a house of cards in five minutes.

There is one reading of (32) in which it takes John five minutes to construct the house of cards, and an R-dependent reading in which five minutes after R (=S) John begins construction of the house of cards. The R-dependent reading is the only one available when the adverbial is in initial position, as in (33):

- (33) In five minutes John will construct a house of cards.

However, in **generic** sentences [Carlson, 1980] when the adverbial is in initial position the R-dependent reading is absent:⁶

- (34) In one hour Americans consume five million gallons of fuel.
 (35) In six minutes Martha could gap all twelve plugs.

The simple present tense gives (34) a generic interpretation, and the modal *could* indicates that (35) is also a generic sentence. Generic sentences such as these appear to be exceptions to the generalisation that only the R-dependent reading is available when the adverbial is in initial position. However, in Diesing's treatment items higher in the tree are interpreted as specific when there is no operator present; when the generic operator is present they are interpreted as part of the restrictor of the generic operator, resulting in the phrase *one hour* being interpreted generically rather than as referring to a particular hour.

There are certain incompatibilities between Diesing's proposal and the temporal adverbial data observed here, however. Diesing argues that in English the mapping procedure described by the Mapping Hypothesis is done at the level of Logical Form (LF), and that NPs with certain determiners act like quantifiers, adjoining to IP at LF. For most determiners her analysis is consistent with the observations concerning temporal adverbials, but her proposal for definites is problematic, as I will now explain.

Milsark [1974] distinguishes between two types of determiners: *weak* determiners such as *a*, *some* and *three*, which can appear with a subject in *there*-insertion contexts, and *strong* determiners such as *the*, *all* and *most*, which cannot appear in these contexts:

- (36) There is/are a/some/a few/many/three fly (flies) in my soup.
 (37) *There is/are the/every/all/most fly (flies) in my soup.

Another distinction between these two types of determiners, Milsark notes, is that strong determiners presuppose the existence of the entities they are applied to, while weak determiners are ambiguous, having both a presuppositional and a nonpresuppositional reading. For example, the weak determiner *some* has one reading in (38a) in which the existence of the ghosts is asserted but not presupposed, and another reading in (38b), where stressed *some* presupposes the existence of ghosts:

- (38) a. There are some ghosts in my house.
 b. SOME ghosts are in the pantry; the others are in the attic.

Strong determiners such as *every* and *most* only allow a presuppositional reading, as in the following examples, where the existence of ghosts is presupposed:

- (39) a. Every ghost roasted marshmallows.
 b. Most ghosts sleep late.

⁶Example (34) was pointed out to me by Derek Gross.

Diesing proposes to account for the difference in the presuppositionality of strong and weak determiners by claiming that they are treated differently at LF. In Government and Binding Theory [Chomsky, 1981], the scope of a quantifier is determined at LF through the movement rule of *Quantifier Raising (QR)* [May, 1977, May, 1985]. While May treats both strong and weak quantifiers alike with respect to QR, Diesing proposes that strongly quantified NPs behave like quantifiers at LF, adjoining to IP, and weak quantifiers are ambiguous, and may or may not adjoin to IP. An important consequence of this treatment is that it associates strong readings with the restrictive clause and weak readings with the nuclear scope.

If we follow Diesing in equating specificity with presuppositionality, we correctly predict that any adverbial with a weakly quantified object will cause a sentence to have two readings:

(40) Martha will be in her office for an/a few/many/three hour(s).

We also predict that any adverbial with an object that has a strong determiner will give the sentence an R-dependent reading because, whether the adverbial is attached at VP-level or not, the NP will raise at LF to be interpreted as part of the restrictor clause. This analysis makes correct predictions for all strong determiners except *the*. Consider that the sentences with strong determiners described in (41) are unambiguous:

(41) John will live in Boston during every/all/most leap year(s).

The sentence in (42) with the strong determiner *the* is ambiguous, however:

(42) John will live in Boston during the summer.

There is one reading of (42) in which *the summer* can be interpreted as any future summer, as shown in (43):

(43) John will live in Boston during the summer some day.

There is also an R-dependent reading of (42) in which P(E,R) forces *the summer* to be interpreted as the summer most closely following R (=S), and this is the only reading available when the adverbial is in initial position, as shown by the acceptability of (44) and the unacceptability of (44) with *some day*, as in (45):

(44) During the summer John will live in Boston.

(45) #During the summer John will live in Boston some day.

The determiner *the* in sentence (42) acts like a weak determiner, allowing both readings. We cannot adopt Diesing's explanation for definites in explanation of the temporal adverbial data, although we can adopt her explanation for other types of NPs. Further investigation is required in order to explain the relationship between Milsark's observations concerning definite descriptions and the way in which they behave within

temporal adverbials.

A second way in which Diesing's proposal conflicts with the observations concerning temporal adverbials is that she explains the specific and nonspecific readings of NPs in terms of their LF positions, while we have been considering S-structure positions of temporal adverbials. In fact, in order to adopt Diesing's proposal we must stipulate that weakly quantified NPs contained in temporal adverbials do not undergo LF movement; without this stipulation we predict that a VP-level adverbial containing a weakly quantified NP can give the sentence an R-dependent reading in spite of the syntactic evidence presented above that shows that R-dependent readings are only available for sentence-level adverbials (at S-structure).

Summary

I argued that within Reichenbach's treatment of tense it is possible to analyse the present perfect as behaving uniformly with the other tenses in terms of its interaction with temporal adverbials. I argued that a sentence with a temporal adverbial is always ambiguous, but in the case of the present perfect one reading may be ruled out because of problems with time deixis. I then considered three alternatives for treating this ambiguity: Dowty's proposal that adverbials are ambiguous is workable but uneconomical. Kamp & Reyle's proposal that the ambiguity is an effect of the perfect was discarded because of the observation that this ambiguity is present in the simple tenses as well. Diesing's analysis of the syntax-semantics interface can explain these data without requiring the assumption that the adverbials are ambiguous, and it has the advantage that it explains why generic sentences appear to be exceptions to the pattern observed in the temporal adverbial data. It also has the advantage of being more economical than Dowty's approach because the DRS construction rules which treat material higher in the tree different from lower material are necessary for treating indefinites as well. However, the data raise questions concerning some aspects of Diesing's treatment such as her treatment of definite descriptions and what happens to NPs within adverbials during LF.

References

- Carlson, G. (1980). Reference to kinds in English. In J. Hankamer, editor, *Outstanding Dissertations in Linguistics*. Harvard University.
- Chomsky, Noam (1981). *Lectures on Government and Binding*. Dordrecht: Foris.
- Diesing, M. (1992). *Indefinites*. The MIT Press, Cambridge, MA.
- Dowty, D. R. (1979). *Word Meaning and Montague Grammar*. D. Reidel, Dordrecht, Holland.
- Enç, M. (1991). The semantics of specificity. *Linguistic Inquiry*, 22:1–25.

- Hinrichs, E. (1981). Temporale anaphora in englischen. StaatsExamen thesis, Universität Tübingen.
- Hitzeman, Janet (1993). *Temporal Adverbials and the Syntax-Semantics Interface*. PhD thesis, University of Rochester. Available through anonymous FTP to maxwell.cogsci.edinburgh.ac.uk.
- Kamp H. and Reyle, U. (1993). *From Discourse to Logic*. D. Reidel, Dordrecht.
- Kamp, H. (1979). Events, instant and temporal reference. In R. Bauerle, U. Egli, and A. von Stechow, editors, *Semantics from Different Points of View*, pages 376–417. Springer-Verlag.
- Kamp, H. (1981). A theory of truth and semantic representation. In J. Groenendijk, T. Janssen, and M. Stokhof, editors, *Formal Methods in the Study of Language*. Mathematical Centre, Amsterdam.
- May, R. (1977). *The Grammar of Quantification*. PhD thesis, MIT, Cambridge, MA.
- May, R. (1985). *Logical Form in Natural Language*. The MIT Press.
- McCoard, Robert W. (1978). *The English Perfect: Tense-Choice and Pragmatic Inferences*, volume 38 of *North-Holland Linguistics Series*. North-Holland Publishing Company, Amsterdam.
- Montague, R. (1973). The proper treatment of quantification in English. In K.J.J. et al. Hintikka, editor, *Approaches to Natural Language*, pages 221–242. D. Reidel, Dordrecht. Reprinted in [Thomason, 1974].
- Partee, B. H. (1984). Nominal and temporal anaphora. *Linguistics and Philosophy*, 7:243–286.
- Reichenbach, Hans (1947). *Elements of Symbolic Logic*. McMillan.
- Reinhart, Tanya (1983). *Anaphora and Semantic Interpretation*. The University of Chicago Press, Chicago, IL 60637.
- Reuland, E. (1988). Indefinite subjects. In *Proceedings of NELS 18*, pages 375–394, GLSA, University of Massachusetts, Amherst.
- Thomason, R. H., editor (1974). *Formal Philosophy: Selected Papers of Richard Montague*. Yale University Press, New York.

Language Technology Group
 Human Communication Research Centre
 University of Edinburgh
 2, Buccleuch Place
 Edinburgh EH8 9LW Scotland

janet@cogsci.edinburgh.ac.uk