

The (Temporal) Semantics and (Modal) Pragmatics of the Perfect

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The English perfect involves two fundamental components of meaning: a truth-conditional component involving temporal notions and a presupposition best expressed in terms drawn from the analysis of modality. The semantics draws much for the Extended Now theory (McCoard 1978 and others), but improves on it by showing that many aspects of the perfect's temporal contribution may be factored out into independent semantic or pragmatic principles. The pragmatic analysis unifies views of the function of the perfect as indicating either a 'result state' or the 'current relevance' of some past event. This unification is naturally stated in terms similar to those used to explain the context-dependency of modals.

1. INTRODUCTION: READINGS OF THE PERFECT

I will argue that the meaning of the English perfect construction illustrated in (1) should be analyzed as incorporating both temporal and modal components:

- (1) Mary has eaten breakfast already.

Perhaps the one thing that current analyses of the perfect agree upon is that the present perfect sentence (1) indicates some type of connection between the past event of Mary eating breakfast and the speech time (the time indicated by the sentence's tense). We will see below how the various approaches attempt to make precise this connection. However, the literature has been plagued by having to account for the numerous 'readings' of the perfect, for example:

Resultative Perfect:

- (2) Mary has read *Middlemarch*.

Existential Perfect:

- (3) The Earth has been hit by giant asteroids before (and it probably will be again.)

The existential perfect overlaps with what is called the 'experiential' or 'current relevance' perfect, terms which may include (2) and (6) as well.

Continuative Perfect:

- (4) Mary has lived in London for five years.
 (5) John has been in Baltimore since yesterday.

The continuative perfect is also referred to as the 'universal' perfect.

'Hot News' Perfect:

- (6) The Orioles have won!

In this set of data, we see a wide variety of temporal relations between the event e described and the speech time s . In (2), e probably precedes s by no more than a few years; in (3) events may have intervened, while in (6) it precedes by only moments. Contrasting with all of these cases, in (4)-(5) e may either overlap or precede s , the case where they overlap being labeled the 'continuative perfect'. The most obvious puzzle here is what accounts for the contrast between continuative and non-continuative readings, that is what allows for e and s to overlap in some cases but not others.

We also see in (2)-(6) a wide variety of non-temporal relations. While (2), like perhaps (6), seems to indicate a current result of a past event, (4)-(5) do not have this character. They simply indicate the continuance of a past event into the present. Example (3) does not indicate a result state either, but rather points to the need to consider a fact about the past (that asteroids fell) while contemplating what may happen in the future. If it describes an victory which has just occurred, (6) seems to suggest that this event is especially noteworthy.

This variety of temporal and non-temporal relations compatible with the perfect poses a challenge for semantic analysis. Any attempt to fix on one as the central contribution of the perfect will fail when confronted by the others. We will see in section 2 how all of the current approaches are unable to capture the full range of possibilities. I will claim despite this that a precise, uniform analysis is possible, characterizing the meaning of the perfect in terms of a semantic and a pragmatic component:

Semantic Component: The truth-conditional contribution of the perfect is temporal, but this aspect of its meaning is more limited than has previously been supposed.

The possibility of a continuative or a non-continuative reading follows from independently needed principles pertaining to aspectual class.

Pragmatic Component: The pragmatic contribution of the perfect is a presupposition which unifies all of the non-temporal relations observed (1)-(6). It is to be stated in terms of the theory of epistemic modality, allowing an precise development of such informal notions as ‘current relevance’ and ‘result state’.

Let me sketch the idea behind these two components. The basic observation underlying this approach to the truth-conditional contribution is that in the non-continuative cases (1)-(3) and (6), the clause with which the perfect combines is eventive, while in the continuative (4)-(5), it is stative (see e.g. Bauer 1970, McCoard 1978, Brinton 1988). More precisely, as we shall see in more detail below, when a perfect is formed from an eventive clause, it cannot receive a continuative reading, while when formed from a stative one, it can be either continuative or not.¹ Thus, in the context of the perfect it seems that events and states relate to the speech time differently. This contrast is reminiscent of other well-known facts, such as the different behavior of events and states with regard to sequence of tense phenomena and temporal sequencing in discourse. For example, the embedded clauses in (7) show a sensitivity to the state/event distinction similar to that observed in (1)-(6):

(7)a Mary said that John smiled. (eventive complement)

(7)b Mary said that John lived in Baltimore. (stative complement)

In example (7)a, John’s reported smiling must precede the time at which Mary said that he smiled. That is, it might report Mary’s utterance of “John smiled.” Example (7)b, in contrast, allows that the time of John’s reported residency in Baltimore either precedes or overlaps the time of Mary’s talking about it. It might report Mary’s utterance of either “John lived in Baltimore” or “John lives in Baltimore”. The former of these is known as the ‘shifted reading’ and the latter as the ‘simultaneous reading’ (cf. e.g. Abusch 1988,

Ogihara 1989). Note that the sensitivity of simultaneous and shifted readings to aspectual class parallels that of continuative and non-continuative uses of the perfect. In section 3.2, I will argue in more detail that this similarity is not a coincidence, but rather shows that a single principle independent of the semantics of the perfect and that of sequence of tense is responsible for the observed facts.

Turning now to the presuppositional contribution of the perfect, the central idea is that the variety of non-temporal relationships observed in (1)-(6) is analogous to the context-dependency observed in the semantics of modals. To see this in a semi-formal way, let us begin with the ‘resultative’ perfect in (2). One thing (2) asserts is that Mary read *Middlemarch*. In addition, suppose that in the context in which it is used, the sentence points out that a relevant result of Mary’s reading *Middlemarch* holds at the speech time – for example, that Mary understands, and so can explain to us, George Eliot’s style. In other words, Mary’s reading *Middlemarch* caused this state. Schematically:

(8) CAUSE(p, Pres(s))

Here p indicates the semantic content of the sentence, roughly the proposition that Mary read *Middlemarch*, and s is the contextually determined result state.

Next let us consider (3). The intuition behind the term ‘current relevance’ is that consideration of the fact that giant asteroids have fallen on Earth before will lead one to important conclusions about the present. In other words, the fact that giant asteroids have fallen on earth before implies (along with other contextually available information) the existence of some important current state s, for example that our cities are in danger:²

(9) \circ (p, Pres(s))

Here, p is the proposition that giant asteroids fell on earth before and ‘ \circ ’ is a modal operator whose characteristics must be elucidated. Suppose that among the things taken for granted in the conversation are that (i) our cities can’t stand bombardment by giant asteroids and that (ii) what happened a few million years ago is a good guide to what astronomical disasters may occur today. The Common Ground, the set of propositions including (i) and

(ii) that are accepted in the conversation, together with p , imply that our cities are in danger. Thus, \circ represents a form of epistemic necessity, and (9) indicates that the existence of s follows from p plus some known facts. The proposition p is relevant to the conversation in the sense that it is the additional premise which lets us get from the background assumptions like (i)-(ii) to the conclusion that s holds.

A comparison of (8) and (9) lets us see the general strategy which I intend to pursue. In both cases, the sentence indicates some modal relation between p , the proposition under the scope of the perfect, and the proposition that some current state exists. In one case the relation is ‘causes’, while in the other it is ‘contextually implies’. Of course it is well known that modal elements are subject to a great deal of context-dependency. I will claim that the perfect is to be analyzed in terms of a single two-place modal operator \mathbf{P} , and that the variety of readings of the perfect follows from the variety of modal relations \mathbf{P} may indicate. Thus, just as *must* can indicate epistemic or deontic necessity, depending on context, \mathbf{P} can indicate such relations as causation or contextual implication. This central idea may be summarized as follows:

(10) Presupposition of the Perfect (preliminary)

A sentence S of the form $\text{TENSE}(\text{PERFECT}(\phi))$ presupposes:

$\mathbf{P}(p, \text{TENSE}(s))$,

where the interpretation of $\mathbf{P} \in \{\text{CAUSE}, \text{contextual implication}\}$ and

p = the proposition expressed by S .

The formulation in (10) will be improved upon in various ways. For example, the mechanisms for switching among ‘readings’ for \mathbf{P} will be drawn from the analysis of modality, and indeed will be more similar to one another than (10) indicates. Moreover, for the requirement to make testable predictions we must make sure that state s mentioned in (10) is relevant to the context in the right way; not just any trivial result is sufficient to make a resultative perfect felicitous, for example. Nevertheless, at this point the strategy should be clear: the perfect may indicate a variety of relations between past event and present time;

each of these can be seen as a modal relation; and the context-dependency of modals is an appropriate model for how the correct relation is selected in each case.

For the bulk of this paper, I will concentrate on the present perfect, as in (1)-(6). For the most part, what I have to say would translate to the past perfect without problem. However, it has been argued that the past perfect is ambiguous between a past-of-perfect and a past-of-past reading. I will address this issue in section 3.2.5. I would also like to remind readers of the difference between the perfect, what will be analyzed here, and perfective aspect. The latter has to do with notions like the completion/non-completion of events, or whether they are viewed as an unanalyzed whole (e.g. Comrie 1976, Smith 1992, Kamp & Reyle 1993, Singh 1998); while the English perfect is perfective, it shares this characteristic with the simple past, and I will not be concerned with perfectivity here.

2. SOME PREVIOUS ANALYSES OF THE PERFECT

The main goal of this section is to show that the interpretation of the perfect must take into account both temporal and non-temporal factors. The previous literature on the subject has uncovered a range of facts which show both sorts of notions are needed if we are to explain the grammatical restrictions which pertain to the perfect, its distribution in context, and its precise interpretation in those contexts in which it occurs. While various theories have concentrated on one or another sort of fact, among them a picture emerges of the full range of data which must be explained. Perhaps the best existing survey of the types of approach which have been taken is McCoard (1978). Of those which he discusses and critiques, two still have contemporary supporters. Thus, I will divide this section into three parts. Section 2.1 and 2.2 discuss these two approaches, which I will call the Indefinite Past theory and the Result State theory. Then section 2.3 discusses McCoard's Extended Now theory and its descendants.

2.1 *The Indefinite Past Theory*

A number of scholars have proposed theories of the present perfect which are equivalent, or nearly so, to the statement that the clause under the scope of the perfect is true at some past time, though they may admit additional pragmatic factors as also relevant. Reichenbach's (1947) analysis is the earliest formal theory with this character; he proposes that a perfect requires that the *event time* precede the *reference time*, which in the case of a present perfect must be the time of utterance. Similarly, Montague (1973) directly treats the perfect as an indefinite past within a Priorian framework, and Inoue (1979) explicitly states that the present perfect is truth conditionally equivalent to the past. Klein (1992, 1994) proposes that (2), repeated here, simply indicates that the present time falls into the *posttime* of an event of Mary reading *Middlemarch*. This idea appears equivalent to Reichenbach's, Inoue's, and Montague's.

(2) Mary has read *Middlemarch*.

Giorgi & Pianesi (1998) define the result state of an event as the sum of all of the events which follow it. In the case of (2), the result is everything that happens after Mary read *Middlemarch*. Then (2) asserts that the utterance time falls during this result. This also seems to result in the same 'indefinite past' truth-conditions, differing only in that it is formulated in terms of event structures. Stump (1985) has a slightly different view: he takes the present perfect to describe an event which is non-future, but which may be either past or present. Nevertheless, his approach is subject to some of the same difficulties as the others'.

Except for Stump's formulation, the indefinite past theory has difficulty with continuative perfects like (4), repeated below:

(4) Mary has lived in London for five years.

Here it seems that the utterance time does not follow the time when Mary lives in London. Klein attempts to explain (4) by saying that the adverbial *for five years* must be taken to have scope under the perfect, so that the event being described is not Mary's full life in

London, but rather a Mary-lives-in-London-for-five-years event. This event, it is claimed, is fully past, since (4) can only be true if she is already into her sixth year in London.

However, this analysis does not seem applicable to the continuative reading of (11), as pointed out by Kuhn & Portner (1997):

(11) Mary has lived in London since 1966.

Here, it seems that the Mary-lives-in-London-since-1966 event is still ongoing, and so the utterance time cannot follow it.

A more significant difficulty for the indefinite past theory is the fact, noted in the Introduction, that the perfect interacts differently with eventive and stative clauses. Recall that an eventive present perfect always requires that the event time precede the speech time, while in many cases a stative allows the two to overlap, resulting in the continuative reading. This contrast argues that it will not do to say simply that the temporal meaning of the perfect is either 'past' (like Klein) or 'non-future' (like Stump). The theory must provide an avenue for aspectual class to become relevant to the temporal relationship expressed.

The indefinite past theory also has difficulties with the fact that in English the perfect may not cooccur with a past time adverbial. Example (12)a contrasts with the simple past (12)b:

(12)a *John has arrived last week.

(12)b John arrived last week.

Both Klein and Stump provide implicature-based explanations for why (12)a is bad. Stump's account is based on the idea that the perfect is a more marked construction than the simple past, and so the use of the present perfect implicates that it would have been inappropriate to use the past. However, noting that (12)a and (12)b are equivalent on his analysis (due to the contribution of *last week*, which is more specific than either the perfect or past), this implicature could never be true in the case of (12)b. Thus the sentence is anomalous.

Klein's explanation is similar. His idea is that, given that the adverbial in (12)a explicitly locates John's arrival during last week, it entails that the utterance time falls into its posttime. Thus, the use of the perfect is ruled out, since the job it does (of locating the utterance time into the event's posttime) has already been accomplished by the adverbial. Klein elevates this reasoning to the level of a constraint, the P-Definiteness Constraint; as stated in his Reichenbachian framework, the requirement is that the event time and reference time cannot both receive a definite temporal specification. In the case of a present perfect, the reference time is equated with the speech time, so the event time may not be definitely specified as well. The adverbial in (12)a specifies the event time, violating the constraint. The notion of definiteness required here is not clear to me, however; it would appear that the past event is given a more 'definite' location in *John has arrived within the last hour* or *John has just now arrived* than in **John has arrived in the 1980's*.

A final point is that the indefinite past theories have great difficulties with examples like (13), based on Dietrich (1955, cited in McCoard 1978):

(13) ??Gutenberg has discovered the art of printing.

There is no reason why an indefinite past interpretation of the present perfect should not be fine here. Gutenberg's discovery of printing did occur before the present time. Since the sentence does not have an offending past adverbial like (12)a, the theory doesn't give us a reason why it should be counted as pragmatically anomalous.

In light of these difficulties, a supporter of the indefinite past theory might argue that the core temporal semantics should be augmented with some additional pragmatic constraint. Inoue (1979) does just this, combining a indefinite past semantics with a pragmatic analysis based on the idea of 'current relevance'. She proposes that the present perfect indicates a relation of mutual entailment between the proposition expressed by the perfect sentence and the 'discourse topic', a contextually given proposition (p. 574 ff.). For example, consider the following (based on Inoue's (65): 576):

(14) A: Which Nobel Laureates have visited Princeton?

B: Let's see, Einstein has, Yukawa has, Friedman has....

Inoue paraphrases the topic for B's utterance as *Talking about the Nobel Prize winners visiting Princeton*, and proposes that (in combination with the propositions in the common ground) there is a relation of mutual entailment between this proposition and the proposition denoted by *Einstein has (visited Princeton)*. Moreover, Inoue suggests that, in order for the topic to be *currently* relevant, a situation of that kind be 'repeatable' at the speech time.³ According to this, (14) is acceptable because it possible for Nobel Prize winners to visit again. I find the core of Inoue's intuition to be quite attractive: The proposition expressed by the perfect sentence is 'relevant' in that it is in a logical relation to another which is at issue in the conversation. My own proposal below will develop this intuition. In addition, the repeatability condition allows an explanation of the 'lifetime effects' which have frequently been discussed in connection with the perfect. Chomsky (1970) points out the following contrast:

(15)a ??Einstein has visited Princeton.

(15)b Princeton has been visited by Einstein.

Example (15)a seems odd because, out of the blue, it suggests that Einstein is still alive. Inoue's idea is that this comes about because the implicit discourse topic for (15)a is something like *Talking about Einstein's visits to American universities*. Since the perfect requires that 'situations of this kind' be repeatable, this would imply that Einstein is alive. Since he is not, the sentence is odd. In the context given by (14), however, (15)a (or rather its elided version) is not odd because the discourse topic there does not specifically have to do with Einstein. Presumably (15)b is natural out of context because it suggests an implicit topic similar to that in (14) and unlike that of (15)a. Inoue does not explain why this is, however, and this leaves a significant gap in her account. My discussion of this phenomenon below will incorporate much of Inoue's insight.

Despite these advantages, there are a number of problems with Inoue's formulation of the current relevance requirement. At the most basic level, it is not clear what proposition

she intends to indicate with *Talking about the Nobel Prize winners visiting Princeton*. It does not seem plausible to take the conversation's topic to be 'we are talking about the Nobel Prize winners that have visited Princeton'—the topic has to do with the fact that certain individuals have visited, not the fact that somebody is talking about them (the latter is more a topic for a linguistics paper). A more plausible candidate is something like 'some Nobel Prize winners have visited Princeton', and *Einstein has (visited Princeton)* does contextually entail this; however, what Inoue proposes is a relation of mutual entailment, and even adding in background assumptions from the common ground, the proposition that some Nobel Prize winners have visited Princeton will certainly not entail that Einstein has visited Princeton. The requirement of mutual entailment itself seems questionable in any case, as this would mean that the topic proposition and the sentence itself are informationally equivalent, given background assumptions. If the two are equivalent, why would the perfect sentence be asserted at all?

Like the other indefinite past theorists, Inoue also has problems with cases like (13). There are plenty of plausible discourse topics to which (13) would be relevant that don't specifically relate to Gutenberg, for example *Talking about important discoveries by Germans*. Indeed, question/answer pairs like the following are perfectly acceptable when the simple past is employed in B's response:

- (16) A: What important discoveries have been made by Germans?
 B: Gutenberg discovered(/*has discovered) printing,

The unacceptability of the perfect in B's reply contrasts with example (14). I will argue, following McCoard (1978), that the Gutenberg example shows the need to abandon the simple temporal semantics of the indefinite past theory.

2.2 *The Result State Theory*

Another major family of theories takes a sentence in the present perfect to assert the present existence of a state which results from the past event described under the scope of *have*.

The problem here is to identify the right result state. Any past event will have many current results and if we take the perfect to simply indicate the existence of *some* result state, it will be truth-conditionally equivalent to an indefinite past (as pointed out by Kuhn & Portner 1997). This would be a bad consequence, given the problems just noted for the Indefinite Past theory. The same point goes for the suggestion, which has been made to me numerous times in conversation, that (2) simply asserts the present existence of a state of Mary having read *Middlemarch*. Clearly this state, if there is such a state, will hold at any time following the reading event. This approach thus also seems to imply the same interpretation as that predicted by the indefinite past theory.

For these reasons, some supporters of the Result State analysis have elaborated upon it in various ways, developing the idea that a perfect sentence doesn't just assert the existence of some result, but rather picks out a particular, relevant result. Smith (1992), who very clearly demonstrates the need for this kind of elaboration, identifies the result state with the denotation of the subject having some relevant property, while Moens & Steedman (1988) appeal to 'general knowledge', with the idea that the perfect is only acceptable if one can identify a sufficiently relevant result. One problem for the latter type of view comes from (13), repeated here, and (16):

(13) ??Gutenberg has discovered the art of printing.

As pointed out by McCoard, the fact that (13) and (16) are not acceptable seems devastating for a relevance-based result state theory. It is obvious that the past event of Gutenberg discovering printing has easily identifiable results which are quite relevant to our lives today.

Smith is in a better position with (13). Since she identifies the result state with the subject's referent having some property, she can appeal to the fact that Gutenberg is dead, and so lacking in relevant properties, to explain (13). In this way, Smith's analysis straightforwardly handles the lifetime effect in (15). On the other hand, cases in which the lifetime effect does not hold are more difficult. With regard to examples like (17) below,

Smith might appeal to some kind of post-mortem existence for authors (from Kuhn & Portner 1997):

(17) Frege has contributed a lot to my thinking.

However, I don't see how such an approach could distinguish (17) from (13). Why can't Gutenberg also currently have a property (e.g. of being famous or of being thought about by me) which is the result of his discovering the art of printing? An alternative way to deal with (17), suggested by Inoue (1979), would be to propose that it involves metonymy; perhaps *Frege* here refers to Frege's written works, which still exist, rather than the person himself. Such a move runs into problems with sentences like *Frege has contributed a lot to my thinking through his written work*, however, since this ought to be equivalent to the absurdly redundant *Frege's written work has contributed a lot to my thinking through his written work*.⁴ In addition, this kind of strategy would not be applicable to (14), where none of Einstein's currently existing products are at issue.

Another way of looking at (17) would involve modifying Smith's view to identify the result with the topic of the sentence, rather than its subject, having some relevant property (cf. McCawley 1971).⁵ If we take the topic to be *my thinking*, it does seem that the point of the sentence is to indicate some effect there. One problem would be to make precise a notion of topic which can do the required work (e.g. why can't *Princeton* be the topic in (15)a?). In addition, (18) below is problematical for any approach along these lines:

(18) It has already snowed quite a bit.

Sentence (18) contains no referential terms which could function as the topic. This approach would thus have to allow the topic of a sentence (here perhaps an implicit location) not to be overtly represented in the sentence. In the absence of an explicit theory of topichood which both allows this to be the case and provides significant content to the concept of topic, it is not clear that such an analysis makes testable predications.

The most important type of data arguing against result state analyses comes from existential perfects like (3), repeated here:

- (3) The Earth has been hit by giant asteroids before (and it probably will be again.)

There need not be any current, relevant results of the Earth's being hit by giant asteroids for (3) to be acceptable.⁶ The point of (3) simply does not seem to be that those past impacts have any lingering effects: Plausible candidates for such results would be changes to the makeup of the atmosphere, the presence of craters in Mexico, or the extinction of certain creatures and the consequent thriving of others, but the sentence does not seem to require that such consequences really hold. Rather, in the context of talking about the dangers we face today, the mere fact that the Earth was struck may be all that is considered relevant. Perhaps one could phrase this in terms congenial to the result state view by saying that the asteroids' impact has caused some of the speaker's beliefs, and that these beliefs are the topic of the conversation. This suggestion has problems on several accounts, however. First, the speaker's beliefs are not the topic in the intuitive sense: we are talking about the Earth, or asteroids, or the fate of our cities -- not about the speaker's beliefs. And second, this kind of explanation would necessarily extend the concept of causation far beyond its ordinary application: one would never say that the asteroids' ancient impacts *caused* my beliefs; rather my reading or research about them did. So it's not clear what the point of talking about a result state analysis would be anymore. It is more plausible to acknowledge that (3) has epistemic meaning, that is, that it points out the relevance of past events to our thinking today, and to treat it explicitly as such, rather than trying to mimic this semantics by over-extending the concepts of causation and topic.

2.3 The Extended Now Theory

McCoard (1978) argues that the meaning of the perfect places the event described within the "Extended Now", an interval of time which begins in the past and includes the utterance time (see also Bennett & Partee 1978, Dowty 1979, Vlach 1993, Spejewski 1997, Anagnostopoulou et al 1998⁷). The intuitive idea of the Extended Now is that we typically

count a longer stretch of time than the momentary ‘now’ as the present for conversational purposes. Its exact duration is contextually determined, since what we count as ‘the present’ in this sense may vary depending on the conversational topic. Thus, for (2), the Extended Now would be on the order of a few years, while with (3) it would be millions of years long:

- (2) Mary has read *Middlemarch*.
- (3) The Earth has been hit by giant asteroids before (and it probably will again.)

The Extended Now theory can explain the impossibility of (12)a, on the assumption that *last week* must have scope over the perfect:

- (12)a *John has arrived last week.

If the adverbial has to describe the Extended Now, this would entail that it is contained within last week. This is incompatible with the requirement that the Extended Now include the utterance time.

The Extended Now theory is also in a good position to explain the contrast between (13) and (17):

- (13) ??Gutenberg has discovered the art of printing.
- (17) Frege has contributed a lot to my thinking.

The story one would tell here goes as follows: An interval extending back to the time of Gutenberg’s discovery is not a plausible Extended Now in (13), since in a conversation about historical personages the era in which they lived is definitely considered past. In contrast, an interval extending back to the time when my thinking was influenced by Frege might well be taken as present for the purposes of a conversation in which (17) is used. For example, in a discussion of how I came to have the beliefs about semantics that I do, we might count the whole period in which I have been studying philosophy and linguistics as “present”.

While I will follow the general idea of the Extended Now theory, it is not sufficient as it stands. This may be seen with the following examples: Suppose that Mary moved to London five years ago, and hasn't left. During this time, she became ill only once, three years ago, and quickly got well.

(19) (i) Mary has lived in London for five years. (ii) ??She has become ill.

(20) ??Mary has both lived in London for five years and become ill.

(19) is to be taken as a pair of sentences uttered in sequence. Recall that the Extended Now is supposed to be provided by context. Since (i) is acceptable, the contextually provided Extended Now must be able to be at least five years long. So (ii) should be fine (and true), but it is unacceptable. (A past tense sentence, in contrast, would be acceptable here.⁸) The only way out of this difficulty, as far as I can tell, would be to claim that the Extended Now for (i) is not maintained for (ii), but then the question is how and why it changes. At first glance, (i) would appear to add confidence to the idea that the Extended Now is five years long, and not suggest that it should be shortened. Similar remarks apply to (20). The preceding context of (19), i.e. nothing, is the same as that of (20), and it seems to pertain to pretty much the same topic of conversation as (19), Mary's life in London. So why can't a five year long Extended Now be provided to (20), just as it was for (19)'s (i)? These examples show that the Extended Now theory requires some additional constraint on the use of the perfect.

3. A MODAL-TEMPORAL ANALYSIS OF THE ENGLISH PERFECT

The general idea which will be pursued in this section has been briefly discussed in section 1. As this view is fine-tuned, we will make use of certain ideas from the literature on modality and temporal semantics. Before going on with the analysis, then, I will outline these assumptions.

3.1 Background Assumptions

3.1.1 Modality

For the purposes of this paper, I need only make use of a fairly simple theory of modality. I adopt the analysis of modals as dependent on a contextually-supplied parameter of interpretation, the *conversational background* (also known as the *modal base*) discussed by Kratzer (1977, 1981, 1991). We will see how this works momentarily. The ideas that will be presented in this paper could be formalized within a variety of other contemporary frameworks for the analysis of modality as well. In fact what I will present is a simplification of Kratzer's views, in that she also makes use of a second parameter of interpretation, the *ordering source*. The approaches of Groenendijk & Stokhof (1975), Groenendijk, Stokhof, & Veltman (1996), and Brennan (1997), for example, would also suffice. However, a fairly simple analysis is adequate for understanding the semantics of the perfect, so for clarity I will stick with the analysis in terms of conversational backgrounds. In general, an approach to modality will be useful for dealing with the issues discussed here to the extent that it makes explicit the ways in which information present in the conversation contributes to the semantics of epistemic modals.

A conversational background is a function which provides, for each index, a set of propositions. This set of propositions determines the set of accessible worlds relevant for the interpretation of modals. For example, taking indices to be world-utterance situation pairs, a deontic modal like that in (21) utilizes a conversational background that maps each world-situation pair $\langle w, u \rangle$ onto the set of propositions ideally true according to the law in w and u :

(21) Twelve-year-olds must not buy beer.

This set might look something like the following:

(22) $L_{\langle w, u \rangle} = \{ \dots, \text{Children under the age of nineteen do not buy alcoholic beverages, Beer is an alcoholic beverage, } \dots, \text{there is no murder, there is no bribery, } \dots \}$

(I will often refer to the set returned at a particular index, e.g. (22), as a ‘conversational background’ as well.) Sentence (21) is true at $\langle w, u \rangle$ because in every world in $\cap L_{\langle w, u \rangle}$ twelve-year-olds do not buy beer. With an epistemic modal like that in (23), we use a different conversational background, one representing the set of propositions mutually accepted by the speaker and his or her hearer(s) at $\langle w, u \rangle$:

(23) It must be raining.

Let us call the relevant set of propositions $CG_{\langle w, u \rangle}$ (for ‘Common Ground’). The sentence (23) is true iff in every world in $\cap CG_{\langle w, u \rangle}$, it is raining.

Conversational backgrounds may be categorized but not listed: while there appears to be no limit to the variety of conversational backgrounds that may be utilized in particular discourse situations, they fall into various broad classes which go by the well-known names ‘deontic’, ‘epistemic’, etc. This point is particularly clear in the case of everyday ethical reasoning. One might overhear a pained decision-making process like the following:

(24) Given what the law says, I should do it. But given the rules of the Church, I shouldn’t. Of course, given what would be the best for my family, I should. On the other hand, considering the good of society as a whole, I shouldn’t. In light of that pesky voice in my head, however, I guess that I should do it....

Each sentence here makes use of a distinct conversational background – one representing the law, another the teachings of the Church, and so forth. The language treats them all as a group, however, what we call ‘deontic’, as can be seen by the fact that each of the sentences makes use of the modal *should*. In contrast, *must* would be fine in most of the sentences, but is somewhat awkward in a few cases. Another necessity modal, *would*, is impossible throughout; this is because *would* is incompatible with a deontic conversational background.

I propose that the operator **P** utilized in the presuppositional analysis of the perfect accepts a subclass of those conversational backgrounds which would intuitively be categorized as ‘epistemic’:

(25) Pragmatic Schema for the Perfect (revised)

A sentence *S* of the form TENSE(PERFECT(ϕ)) presupposes:

P(*p*, TENSE(*s*)), where **P** is a necessity operator utilizing an epistemic conversational background.

I will discuss the predictions of (25) in more detail below, beginning in section 3.2. In order to show how the conversational context plays into the semantics of the perfect, I will examine particular discourses in detail (albeit simple, constructed ones). This will provide a better understanding of just which conversational backgrounds are compatible with the perfect.

Next we need to consider why **P** has two arguments, as opposed to one, in (25). The second argument position is motivated by the semantics of conditionals. The function of an *if* clause within this framework is to add a proposition to the conversational background. Consider (26):

(26) If Joey is twelve years old, he must not buy beer.

According to Kratzer, here we consider the conversational background $L_{\langle w, u \rangle} \cup \{\text{Joey is twelve years old}\}$. Sentence (26) is true because this set entails that Joey does not buy beer.⁹ There are a couple of ways to formally implement this function of *if*. One might take its contribution to be pragmatic, so that the modality indicated by *must* here is sensitive to the presence of the *if* clause only indirectly, though its effect on the pragmatically supplied background. Alternatively, one might take the modal to be a two-place operator, so that (26) has a logical structure like (27):

(27) MUST(Joey is twelve years old, Joey does not buy beer)

Context continues to supply $L_{\langle w, u \rangle}$ as the conversational background. *Must* then quantifies over worlds in $\cap(L_{\langle w, u \rangle} \cup \{\text{Joey is twelve years old}\})$, saying that (26) is true

iff in every world in this set, Joey does not buy beer. If *must* is taken to be a two-place operator in this way, examples like (21) and (23) may be taken as cases with the trivial proposition *W*, the set of all possible worlds, as a default first argument. They thus quantify over the worlds in the intersection of the conversational background, with no additional restriction.

As can be seen in (25), I take the option of treating modals as two-place operators. The operator **P** involved in expressing the presupposition of the perfect takes two arguments, the first being the proposition under the scope of the perfect. This is notably different from this situation with ordinary modals, where the proposition expressed under the scope of the modal is its second argument. What this means can be seen by comparing (28)a and (28)b:

(28)a Mary has been sick.

Presupposition: **P(sick(m), Pres(s))]**

OP **1st arg.** 2nd arg.

(28)b If she is not at the party, Mary must be sick.

MUST(**~at-party(m), sick(m)**)

OP 1st arg. **2nd arg.**

Intuitively, the presupposition of (28)a says to assume that Mary was sick and consider a consequence of this fact; (28)b, in contrast, says that Mary's being sick is a consequence of the assumption that Mary is not at the party.

3.1.2 Temporal Semantics

With regard to the temporal semantics of the perfect, I make two main background assumptions: a neo-Davidsonian event semantics and Reichenbachian semantics for tense. On the former, it is possible to do everything needed here with very conservative assumptions about what eventualities are like: The set of eventualities is divided into telic events (accomplishments and achievements), processes (or activities), and states. I include

the eventualities described by progressive sentences among the states, though if one wishes the class consisting of progressives and other states may be given some other name (cf. Smith 1999, for example). Eventualities have a part/whole structure paralleling that of ordinary objects (cf. Bach 1986). In order to avoid unnecessary debates, and to make things simpler, I will assume that eventualities are concrete objects with common-sense identity criteria. If John walks across the street to the store quickly, there is one event, not a multiplicity as some theories of events would have it (e.g. John's crossing the street, John's walking to the store, John's walking quickly, and perhaps more). Similarly, conjunctions, disjunctions, and negations do not describe conjunctive, disjunctive, or negative eventualities, if there are such things, but rather simply conjoin, disjoin, or negate propositions stating that separate, simple eventualities exist. A more elaborated theory of events would not be incompatible with what I say below, but would not add anything to it either.

The primary purpose for assuming an event-based semantics is that it makes it easy to relate the approach here to the Result State theory of the perfect. In many cases, it is natural to explicate the meaning of the perfect by saying that it indicates the existence of some relevant result state, and the present account will say this directly (clarifying the notions of 'indicates', 'relevant', and 'result'). I see no reason, however, why the analysis could not be given in an event-free interval semantics framework. Instead of referring to a state as in (25), such an approach would make use of a stative proposition. However, I believe the analysis can be presented more clearly by formalizing things in the way I do.

I also wish to draw a few basic assumptions from the Reichenbachian approach to tense semantics. Tense, I assume, relates the speech time to a reference time. The reference time may be either provided by extralinguistic context or fixed through some overt, compositional means. In addition, I take from the Reichenbachian tradition the idea that the perfect is labeled an 'aspectual' construction because it establishes a relationship between the sentence's reference time and its event time. Note that the term 'event time' is actually a

bit inaccurate, because it will be applied to stative sentences as well, but I will stick with the familiar terminology.

In the next two sections I utilize the assumptions just discussed about modal and temporal semantics to motivate and elaborate on the analysis of the perfect sketched in section 1. First I will concentrate on the construction's temporal aspects of meaning (section 3.2). Then I will examine the presuppositional component by looking at result-state and current relevance usages of the perfect (section 3.3). In the ensuing section, 3.4, I will compare the present analysis to others discussed in the literature.

3.2 The Temporal Interpretation of the Present Perfect

3.2.1 Aspectual Class and the Temporal Value of the Perfect

In this section I concentrate on showing that the 'pastness' indicated by the perfect is not encoded in the perfect's meaning, but rather follows from independent principles. The approach I propose is motivated by the contrast in (29):

(29)a Mary has read *Middlemarch*.

(29)b Mary has been reading *Middlemarch*.

In (29)a, the event of Mary reading *Middlemarch* precedes the speech time. In (29)b it may either precede or overlap the speech time, the latter case being labeled the 'continuative perfect'. What is important to note at this point is that (29)a and (29)b differ in that in the latter the perfect operates on a stative sentence (a progressive), while in the former it operates on a nonstative one. A lexical stative would behave the same way as the progressive: *Mary has understood this issue* is compatible with her still understanding it. In general, as noted by Bauer (1970), the required 'pastness' of the perfect exemplified in (29)a correlates with the nonstative nature of the phrase under the scope of the perfect, while the availability of the continuative reading illustrated by (29)b correlates with a nonstative phrase. Abstracting away from irrelevant features like the intensionality of the progressive,

the temporal relations at issue may be summarized with some Reichenbachian terminology as follows:

(30)a Mary has read *Middlemarch*.

Reference time $r =$ speech time (contribution of present tense)

Event time $e < r$.

(30)b Mary has been reading *Middlemarch*.

Reference time $r =$ speech time (contribution of present tense)

Event time $e \text{ Or } e < r$

The goal of this section is to argue that difference between (30)a and (30)b follows directly from the difference in aspectual class, and so do not need to be part of the perfect's meaning.

In what follows I will show that this correlation between aspectual class and temporal relation holds in two separate contexts other than the perfect. The phenomenon seen in (29) is the same as one observed with ordinary sentence embedding verbs in the context of sequence of tense phenomena and with the discourse semantics of tense. To begin with the former case, consider the fact that a simultaneous reading of the embedded past in (31) is possible, but not in (32):

(31) John said that Mary was reading *Middlemarch*. (stative complement)

(32) John said that Mary read *Middlemarch*. (eventive complement)

In these sentences, the time of John's saying represents the reference time for the embedded clauses. Observe that when the embedded clause is stative, that state may overlap the reference time (a 'simultaneous reading') or precede it (a 'shifted reading'), but when it is nonstative, the event must precede it.

According to recent theories of sequence of tense (Abusch 1988, 1997 and Ogihara 1989, 1995), this contrast is due to whether the embedded past tense morpheme is semantically active or not. For example, Abusch (1997) proposes that an embedded past tense may be interpreted as provide information about the temporal location of either the

local or embedding verb's event time. In (31), for example, the past of *read* may indicate either that the reading is past (relative to the saying) or that the saying is past (relative to the speech time); in the latter case, the reading event is interpreted as simultaneous with the saying. Ogihara (1989) gets a similar effect through a tense-deletion operation; he proposes that a past tense may be deleted when it is in the scope of another. Thus the simultaneous reading of (31) occurs when the embedded past is deleted, while non-simultaneous readings of (31) and (32) occur when it is not. However, neither variety of sequence of tense theory explains why (32) is unambiguous, and only gets a non-simultaneous reading. Abusch's approach does not explain why, in this case, the embedded past tense cannot be interpreted as constraining the temporal location of the non-local saying event. Or, in terms of Ogihara's formulation, there is no reason why its embedded tense should not be deleted, giving rise to a simultaneous interpretation. This issue has not, to my knowledge, been addressed within sequence of tense theory.¹⁰

The pattern in (31)-(32) is similar to that observed with the perfect, in that an eventive clause is interpreted as past with respect to the reference time, while a stative one is interpreted as either past or overlapping. Based on this, I would like to propose that the existence of an overlap (simultaneous) or a non-overlap (shifted) reading is not due to the presence or absence of a semantically active tense morpheme, but rather that it follows from independent factors. Let us maintain the general assumptions of Ogihara's theory, but propose that *whenever* a past tense morpheme is embedded under another, it deletes.¹¹ If this is correct, the apparent 'pastness' (with respect to the time of John's saying) in the embedded clause in (32) cannot be due to the past tense morpheme. In other words, the embedded clauses in both (31) and (32) are taken to be semantically tenseless, just as a phrase embedded under the perfect operator is. Instead, the precedence relation in (32) and the overlap relation in (31) must follow from some more general principles for establishing temporal relations among eventualities. We can state this temporal sequencing principle

explicitly. Let $\|\phi\|^{r,e}$ indicate that ϕ is interpreted with respect to reference time r and eventuality e . Then we have the following Temporal Sequencing Principle:

- (TSP) For any tenseless clause ϕ , reference time r , and event e ,
- (i) if ϕ is not stative: $\|\phi\|^{r,e}$ implies that e precedes r ; and
 - (ii) if ϕ is stative: $\|\phi\|^{r,e}$ implies that e either precedes or overlaps r .

Note that the (TSP) encodes the same temporal relations as we observed with the present perfect in (30).

3.2.2 A Connection to Temporal Sequencing in Discourse?

The (TSP) encodes a relationship between aspectual class and temporal sequencing that is very similar to what we find within discourse semantics. In the DRT framework (e.g. Hinrichs 1982, Partee 1984, Kamp and Reyle 1993), it is proposed that different aspectual classes of sentences have different properties with respect to how they establish the reference time for subsequent discourse. In this section, I will make some remarks about this similarity, suggesting that it is possible to unify the (TSP) with a principle operating at the discourse level. However, because of the number and complexity of factors affecting the temporal interpretation of discourses, I will not be able to go beyond sketching a part of a larger research program. My goal here is to lend some additional support to the (TSP) by showing that the principles which underlie it are probably operative in a wider domain.

Within very simple discourses of the type in (33)a-c, the reference time for an event sentence is located ‘just after’ (Partee 1984) the event, while for a state sentence it may be included within the state. So, for example:

- (33)a (i) Mary walked in. (ii) She sat down.
- (33)b (i) Mary was tired. (ii) She sat down.
- (33)c (i) Mary was angry. (ii) Suddenly, she smiled.

When the event sentence (33)a-(i) is uttered, it establishes a new reference time r which just follows the time of her walking in. When the subsequent sentence (ii) is interpreted, it is interpreted as describing a event occurring at r , and thus one which follows Mary’s

entrance. In contrast, when the state sentence (33)b-(i) is uttered, the reference time is established within the time of her tiredness; for this reason, (ii) describes an event which takes place during her tiredness. Example (33)c is another case where the first sentence describes a state, but in this instance the reference time may follow the state, so that (ii) describes an event which follows the time when she was angry.

In an important way, this DRT use of the concept of reference time differs from that seen in Reichenbach's work. Instead of merely having a particular reference time, a sentence may be seen as expressing a relation between two reference times: the INPUT REFERENCE TIME provided by prior context, and the OUTPUT REFERENCE TIME provided to subsequent discourse. For example, in the simple sequence (33)a, (i) takes some time provided by context as its input reference time, $r_{(i)}\text{-in}$; its output reference time, $r_{(i)}\text{-out}$, must follow $r_{(i)}\text{-in}$ and then serves as the $r_{(ii)}\text{-in}$ for (ii). Sentence (ii) in turn produces its own $r_{(ii)}\text{-out}$, subsequent to $r_{(ii)}\text{-in}$. (What is normally called the sentence's 'reference time' is what I call its 'input reference time', while the reference time made available for subsequent discourse is my 'output reference time'.) The parallelism between temporal sequencing in discourse and the semantics of the perfect will be more apparent if we remain explicit about the fact that sentences in discourse indicate relations between reference times.

At an informal level, the temporal relationships seen in (33)a-(33)c are the same as those described by the (TSP): eventive sentences require temporal sequencing, as seen in (33)a, while stative sentences are compatible with either temporal sequencing or overlap, as in (33)b-c. Things are a bit more complex than in the previous cases, however, for two reasons. First, there is the need to distinguish the input and output reference times for each sentence. A Discourse Temporal Sequencing Principle therefore needs to be slightly different from the (TSP) outlined above:

(DTSP)

For any clause ϕ , reference times r -in and r -out, and event e ,

- (i) if ϕ is not stative: $\|\phi\|^{r\text{-in}, r\text{-out}, e}$ implies that e overlaps r -in and e precedes r -out; and
- (ii) if ϕ is stative: $\|\phi\|^{r\text{-in}, r\text{-out}, e}$ implies that e overlaps r -in and either precedes or overlaps r -out.

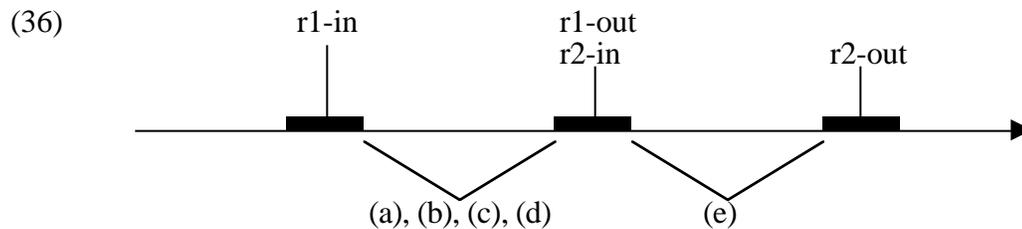
For example, example (33)a-(i) would have its r -in fixed contextually (most likely it is an arbitrary time within some larger interval which may be contextually determined). This is the time at which Mary walked in. Following the (DTSP)'s clause (i), r -out must follow Mary's walking in, and it serves as the r -in for (33)a-(ii). As Mary's sitting down will then coincide with this time, and it is thus ensured to follow her walking in.

The second way in which temporal sequencing in discourse differs from what we have observed with the perfect and sequence of tense is that the discourse principle appears not to be true of all examples. Problematic cases like the following have been brought up by Dowty (1996), among others:

- (34) (a) The children built a boat. (b) John sewed the sails. (c) Mary cut the wood. (d) Bill assembled the hull. (e) They first sailed the boat in April.
- (35) (a) John walked into the forest. (b) The birds sang. (c) The frogs croaked. (d) The river flowed peacefully by. (e) John sat beside a tree.

In (34), all of the eventualities described by (b)-(d) may have occurred simultaneously with each other and with (a), though all precede (e). In (35), (b)-(d) may be simultaneous with each other, (a), and (e), while (a) must precede (e). Despite these apparent problems, I believe that a closer examination of the discourse function of cases like (34)-(35) shows that they are not in fact counterexamples to the (DTSP). Concerning (34), clearly what is going on here is that (b)-(d) reports parts of the overall event reported by (a). Though in informal terms they fail to 'move the action forward', this does not mean that they fail to conform to the (DTSP). Rather it shows that the r -in and r -out of (b)-(d) coincides with (or at least

falls between) the r-in and r-out of (a). Only when (e) is reached does the overall temporal sequence continue to move forward. The situation may be diagrammed as follows:



Viewed, this way, the interpretation of (b)-(d) is completely in accord with the (DTSP). It differs from simpler examples only in that (b)-(d) fail to identify their r-in with the preceding sentence's r-out. Instead, because they express subevents of (a), they all share its input reference time, r_1 -in. In other words, example (34) shows that the (DTSP) only regulates the relationship between a sentence's r-in and r-out; how these two times relate to the reference times of other sentences in the discourse it not always as simple as just linking the r-out of one sentence with the r-in of the next.

Matters with (35) are a bit different, but still compatible with the (DTSP). Dowty (1986) notes that examples of this kind do involve a temporal sequencing of sorts, though not of the events themselves. Rather, (b)-(d) give an impression of a shifting narrative point of view, a kind of moving camera's eye, which first attends to the birds, then the frogs, and finally the river. This is most likely the order in which John noticed these things, as Dowty points out. What this suggests to me is that (b) does not pertain to the full event of the birds' singing, but rather to a temporal part of it—for example, the temporal part which John attended to (cf. Smith 1999 for a very similar view, as well as a much more explicit discussion of how the semantics of activity sentences fits into the picture). Since this sentence reports an activity, we can count on it also to describe any reasonably long subevent of it. Likewise (c) and (d) describe subevents of the full events of the frogs croaking and the river flowing. These sub-maximal events may then be sequenced by the (DTSP) without implying that the full events of birds singing, frogs croaking, and river

flowing are themselves sequenced. Viewed this way, (35) is well-behaved, reporting a series of events in their correct temporal sequence.

Even though cases like (34)-(35) are fully compatible with the (DTSP), they still leave open an important question: How do listeners know that (34)b-d reports subevents of (a), and that (35)b-d report events seen from a moving point of view? There appears to be little hope of getting anywhere on this just with the tools of semantic theory. Rather, it is common-sense reasoning applied to the content of the examples, in combination with an understanding of the structure of narrative discourse, which allows hearers to determine what is going on. For this reason, going much further with explanation of (34)-(35) and like data requires a detailed theory of narrative structure, such as that of Labov (1972) and the discourse analysis tradition which follows upon it. Labov points out that all narrative is built around a set of eventive clauses presented in the order of occurrence (in his terminology, ‘complicating action’), but that they may contain number of other components (‘abstract’, ‘orientation’, ‘evaluation’, ‘result/resolution’, and ‘coda’). Most relevant to us here, pieces of orientation (scene-setting background information) and evaluation may occur interspersed with complicating action, but are free of the complicating action’s temporal ordering. A hearer determines that a particular clause does not ‘move the action of the narrative forward’ by assigning it one of these categories. Intuitively, this is what is going on with (35), where (b)-(d) provide orientation. Example (34) is perhaps simpler. The speaker must simply rely on the hearer’s world-knowledge to allow him or her to figure out that (b)-(d) report subevents of (a). Given that they are subevents of (a), it immediately follows from the relationship between event structures and temporal structures (however formalized) that the r-in and r-out of (b)-(d) must coincide with or fall in between the r-in and r-out of (a). In the case at hand, each subevent reported by (b)-(d) is independent of the others, and so their reference times may be taken to coincide with (a)’s (though in more complex cases, we might need temporal sequencing within this larger interval).

For reasons of space and focus, I must leave aside any further discussion of such details of how temporal sequencing operates in narrative discourse. I have argued that cases like (34)-(35) are not to be seen as counterexamples to the (DTSP), but rather as manifestations of complex phenomena at the narrative level. Seen from this perspective, the (DTSP) can provide only a part of our overall understanding of temporal sequencing in narrative. But it is part of the story, and so it supports the use of a similar sequencing mechanism with the perfect.¹²

My aim in this subsection has been to make plausible the idea that there are close connections among the semantics of the perfect, sequence of tense, and the principles which govern temporal interpretation at the discourse level. To the extent that this has been successful, I have given support to the idea that the connection between aspectual class and temporal sequencing is to be factored out of the semantics of particular constructions or morphemes, and given over to independent principles. In particular, it need not be part of the meaning of the perfect. As was pointed out, though, many issues need to be resolved before we can confidently say we understand how the (DTSP), or something like it, fits into discourse semantics. Because of this, as I return to the details of the semantics of the English perfect I will state my proposals in terms of the original (TSP), rather than the more complex (DTSP).

3.2.3 Michaelis' Counter-Argument

Michaelis (1998) argues, contra my conclusion above, that the correlation between aspectual class and the readings of the perfect is not sufficient to justify a unitary semantic analysis of the perfect form. Rather, she claims that the perfect is ambiguous (in her view, among three uses: existential, continuative, and resultative, though only the existential/continuative contrast is relevant to us right now).¹³ Her view is based on the observation that, though there is certainly some connection between the aspectual features of a sentence and the reading of the perfect, aspectual features do not suffice to determine the meaning of the

perfect in every case; in particular, as we have noted previously, stative examples like (4) remain compatible with either a continuative or an existential reading. Therefore, she claims, a unified analysis is impossible and the perfect must be treated as ambiguous.

Michaelis doesn't note that precisely the same sensitivity to aspectual class is shared by the perfect, SOT, and perhaps independent past-tense clauses in discourse. This fact argues strongly that aspectual class is an independent factor responsible for the availability of continuative vs. existential interpretations. It would be rather unparsimonious to propose parallel ambiguities for the perfect, the SOT construction, and the unembedded past tense. Moreover, at the methodological level, there is no reason to require of the unified analysis that any precise, formal factor be able to resolve the vagueness between readings in all cases. Neither ordinary lexical vagueness (e.g. the of *tall*) nor more complex cases like the vagueness of modals within Kratzer's analysis has this character. Therefore, it is consistent to hold that the perfect has a single interpretation, sometimes leaving a choice between an existential and a continuative temporal value, while claiming that aspectual class is one factor which helps resolve the vagueness in particular cases. In the next two subsections, we will examine some other factors which also play a role in the perfect's temporal interpretation.

3.2.4 Continuative Perfects

Thus far the primary claim I have made about the temporal interpretation of the perfect has been negative: the basic temporal relations indicated by the perfect follow from the (TSP), and aren't specific to the construction itself. Yet the perfect does show various interactions with temporal elements. In the next two subsections, I will consider certain present perfect sentences with noteworthy temporal features. The first of these concerns the details of the distribution of continuative readings. While they only arise when the perfect takes scope over a stative clause, as implied by the (TSP), some such sentences only have continuative readings, while others do not have them at all. My goal here is to explain more precisely

when continuative readings do and don't occur by looking at some details of the syntax/semantics interface.

A first point is that a continuative use is only possible in examples like (37) in the presence of an overt temporal adverbial. This may be seen in (38), which lacks a continuative reading:¹⁴

(37) Mary has lived in London for five years.

(38) Mary has lived in London.

Individual-level statives show similar properties to the above:

(39) Mary has known the answer (for five minutes).

Without the adverbial, (39) indicates that she does not know the answer any more, but with the adverbial it does not.¹⁵

Another fact to consider is that preposing the adverbial in (37) requires the continuative reading, as noted by Dowty (1979, p. 343):

(40) For five years, Mary has lived in London.

Example (40) entails that Mary still lives in London (a fact which, by the way, lends support to the common assumption that (37) has a separate continuative reading, synonymous with (40), and not simply a vagueness as to whether she is still living in London). Because of this complex pattern of facts, more needs to be said about the conditions under which the overlap vs. the non-overlap conditions allowed for states by the (TSP) are chosen.

The analysis I will give essentially is an elaboration of that of Hitzeman's (1997). To begin with the contrast between (37) and (40), first note that a sentence containing the phrase *for five years* allows an overt specification of the temporal location of the five-year interval, as in:

(41) Mary has lived in London for five years *as of now*.

(42) Mary had lived in London for five years *as of January, 1985*.

I would like to suggest, following Hitzeman, that when this temporal location is not expressed, it can be dealt with in one of two ways. The first option is that it receives a value

from context; in the case of the present perfect, this value is the speech time, though with past perfects like (42) it can be a contextually supplied past time. The other option is that it is existentially quantified. Thus, (37) can mean either of the following:

(43) Mary has lived in London for five years *as of now*.

(44) Mary has lived in London for five years *as of some time*.

The ‘now’ reading of the adverbial seen in (43) gives a continuative use of the perfect. In contrast, the ‘existential’ reading of the adverbial in (44) provides a non-continuative use.¹⁶

Given this idea about how the continuative and non-continuative readings come about, we may consider again the data above. Let us begin with the contrast between (37) and (40). As noted by Hitzeman, an adverbial may receive the existential reading (like that paraphrased in (44)) only when it occurs in postverbal position; a preposed adverbial only has the ‘as of now’, i.e. continuative reading. Her explanation for the correlation between the readings of the adverbial and its position, which I will adopt, is that an operation of existential closure is responsible for the existential interpretation; the idea is that the covert temporal specification in (37) is represented by a variable, and this variable can get bound by an unselective existential quantifier (‘existential closure’) if it is inside the VP. Given these ideas, since (37)’s *for* phrase may be either inside or outside the VP, it may get either reading, while (40)’s preposed *for* phrase cannot be caught by existential closure because it must be outside of the VP. Thus it can only mean *for five years now*. This implies, correctly, that (40) can only have the continuative reading. Thus, Hitzeman’s ideas can explain the ambiguity of (2) and the lack of ambiguity in (40).

Before moving on, I would note that the position of the adverbial in a present perfect sentence affects its interpretation in other ways besides the continuative/existential contrast. It also affects the result state/current relevance presupposition associated with the perfect (to be discussed in more detail in section 3.3). Let us focus on current relevance uses of (37) and (40) within the following context:

- (45) A: We need someone who remembers where that restaurant is. Anyone who has lived in London for four years or longer would remember it.
- B: Mary has lived in London for five years. (= (37))
- B': ??For five years, Mary has lived in London. (= (40))

While B and B' both have a continuative reading, the latter is extremely odd in this context. This is because B can be taken as suggesting that Mary remembers the restaurant, while B' cannot. Speaking informally, this suggests that the 'current relevance' indicated by the perfect is more specifically the relevance of the material under the scope of the perfect. In the context of A, the length of Mary's residency in London is crucial to making the response relevant. With B, *for five years* is under the scope of the perfect, and so relevance is obtained. With B', it is not. The mere fact that Mary has lived in London doesn't provide the information A seeks. This means that we should not consider B'/(40) to be a mere stylistic variant of the continuative use of B/(37).

The remaining problematical piece of data brought up at the beginning of this section is (38), which lacks an adverbial altogether and must receive a non-continuative reading. I follow Bäuerle & von Stechow (1980) in proposing that any sentence which lacks overt temporal adverbials receives a default temporal specification, something like *once* or *at some time*. Within the File Change Semantics-based system utilized by Hitzeman, one would formalize this by saying that the temporal variable associated with the *for* phrases in (37) or (40) is still present in (38), though not overtly expressed, and that it is represented within the VP. Because it is in the VP, it undergoes existential closure, and thus it is equivalent to *at some time*. Furthermore, since the existential interpretation of the temporal variable gives the non-continuative perfect, this suggestion provides an explanation for why (38) lacks a continuative reading.

To summarize, continuative perfects may arise when the clause embedded by the perfect is stative. This much follows from the (TSP). The question of more precisely when they arise and when they don't is complex, and depends in part on the details of how the

adverbials in the sentence are interpreted. I have outlined a system that explains the effects of placing a *for* phrase in sentence-initial or sentence-final position, as well as of not having any adverbial at all. The cases like (37) that have both readings are diagnosed as structurally ambiguous; which structure, and reading, makes sense in a given case depends on context.¹⁷

3.2.5 *Past Time Adverbials*

The most famous property of the English present perfect is its inability to occur with purely past-time adverbials:

(46) *Mary has read *Middlemarch* yesterday.

Intuitively, what is wrong with (46) is an incompatibility between the past time adverbial and the present tense. Different approaches have considered this to incompatibility to be due to either syntactic or interpretive (semantic or pragmatic) factors, and while a syntactic approach is attractive for a number of reasons to be discussed below, I believe that a pragmatic approach is in fact preferable. Giorgi & Pianesi (1997) provide several arguments in favor of the syntactic approach. To begin with, they note, following McCawley (1971), that neither the past perfect nor tenseless perfects display restrictions parallel to (46):

(47) Mary had read *Middlemarch* the day before.

(48) Having read *Middlemarch* yesterday, Mary can answer our questions.

According to the syntactic view, (47)-(48) are easily explained. While (46) is unacceptable because of a syntactic incompatibility between the present tense and past adverb, there is no such incompatibility when the sentence is has past tense, as in (47), or is tenseless, as in (48). Semantic and pragmatic approaches to this phenomenon, in contrast, have sometimes solved the problem by proposing that the perfect form is ambiguous between an aspectual and a past tense interpretation (McCawley 1971, Stump 1985). Example (47) would then be acceptable on the reading where it contains two past tenses, one expressed by the past

and one expressed by the perfect, but not on the reading where it is semantically a past perfect. This approach must rule out the use of the perfect form with past tense meaning in simple present perfect cases like (46). (This might simply be because the simpler past tense form is syntactically available in these cases to do the same job, and so ought to be used.)

Giorgi & Pianesi support their syntactic approach by noting the inapplicability of the restriction seen in (46) to many other languages, such as Italian, German, Dutch, and Icelandic:

- (49) Gianni è partito alle quattro. (Italian)
Gianni is left at-the four

They argue that in languages of the Italian sort, so-called present tense sentences are actually tenseless, so that the present is simply the absence of past, in contrast to English-like languages (including also mainland Scandinavian) where the present tense is syntactically and semantically realized. In Italian, therefore, this is no syntactic incompatibility between the so-called “present” tense and past adverbial, since the “present” is actually tenseless. This leaves open many questions as to how what we call “present tense” sentences are interpreted in the two classes of languages. I leave these aside, as they are of only marginal relevance in understanding Giorgi and Pianesi’s analysis of the English present perfect.

Another point which Giorgi & Pianesi take to be in favor of their analysis is that the restriction against past time adverbials with the present perfect does not seem to be absolute. Following Klein (1992, 1994), they cite examples such as (50):

- (50) I know St. Thomas has Saturday evening mass. I have attended mass there
on (a) Saturday.

Klein and Giorgi & Pianesi differentiate (50) from bad cases like (46) by suggesting a difference in definiteness. In particular, they claim, *on (a) Saturday* is indefinite, while *yesterday* is definite. They then suggest that the real constraint is against definite temporal adverbials with the perfect. This leaves open the question of in what sense *just now*,

acceptable with the present perfect, is less definite than *last year*, which is not. Moreover, it's not clear to me why (50) should be seen as arguing against the view that past time adverbials are disallowed with the present perfect. Though as a whole (50) must pertain to a past event, *on (a) Saturday* itself could also describe present or future occurrences. In and of itself it is not a past time adverbial. Thus, a restriction against past time adverbials co-occurring with the present perfect should not be expected to be applicable to (50). For this reason, it seems to me that (50) and similar cases do require us to change our view of examples like (46).¹⁸

Opposed to Giorgi & Pianesi's arguments in favor of a syntactic approach to (46) is other evidence that the phenomenon is actually pragmatic. Example (13), repeated below, seems to be unacceptable because Gutenberg's discovery was too long ago, despite the absence of any temporal adverbial:

(13) ??Gutenberg has discovered the art of printing.

Since no adverbial is present, it does not seem possible to provide a syntactic account of (13) along the lines of Giorgi & Pianesi's ideas. Nor does it seem plausible to suggest that (13) is unacceptable because of any failure of a current relevance or result state requirement: the event in question has obviously significant current results. Thus, the temporal interpretation of (13) seems to be what is at issue. Furthermore, the unacceptability of (13) seems particularly linked to the fact that it is a present perfect; a past perfect analogue is acceptable. Example (51) is to be considered as a passage from a history text from later in this decade:

(51) In the final few years of the twentieth century, the world saw the advent of paperless publishing over the world wide web. Ever since *Gutenberg had discovered the art of printing*, mass publication had followed a paper and ink model...

Example (51) suggests that the unacceptability of (13) is crucially tied to its present tense, just as that of (46) is. Ideally we will be able to relate to unacceptability of both (13) and (46) to a single factor having to do with the present tense.

As noted in section 2.3, accounting for examples like (13) has been the specialty of the Extended Now theory of the perfect, which plausibly explains its status as resulting from the fact that Gutenberg's discovery is too long ago to fall within the Extended Now of any context in which it would might be naturally used. I will pursue a particular way of working out this idea. Towards this end, note that the unacceptability of (13) does not seem to be part of its truth conditional semantics. This can be seen by the fact that its negation is not judged true, but rather equally odd. Rather, it seems that (13) registers an infelicity on the order of a presupposition failure. This point will be crucial to the analysis I will provide of (13) and (46).

From the data above, we can list the crucial facts to be explained as follows:

- (52)
- (i) A present perfect is unacceptable with a past time adverbial, as in (46).
 - (ii) A present perfect is unacceptable if the event it describes does not fall within a plausible Extended Now, as in (13).
 - (iii) These restrictions only apply to present perfect sentences; past perfects and tenseless perfects are exempt.

Point (iii) suggests that, if we wish to explain the data in terms of an Extended Now requirement, this requirement actually arises from the present tense, and not from the perfect. It may be stated as follows, where $XN_c(u)$ indicates the Extended Now in context c for a sentence uttered at u .

- (53) XN Presupposition: A present tense sentence is only usable in context c if the event it describes falls within the extended now in c .

More formally: For any context c and present tense sentence S ,

$c + \llbracket [S \text{ PRES } \phi] \rrbracket^{r,c}$ is only defined if $e \in XN_c(r)$.

The requirement will only be observable in present perfect sentence, since simple (non-perfect) present tense sentences obey the stronger constraint that e coincides with the moment of utterance.¹⁹ Only with perfect aspect, where e may precede the moment of utterance, do we observe the weaker requirement that e fall within the extended now.

Point (i) may be reduced to point (ii) if we assume that the use of an adverbial places constraints on what interval may function as the extended now. In particular, I propose the following principle:

- (54) For any past time adverbial α , the use of α in context c presupposes that no event e described by α in c overlaps the c 's extended now.

Example: For any context c and sentence S , $c + \llbracket [S \ \phi \ \textit{yesterday}] \rrbracket^{r,e}$ is only felicitous if $\llbracket \textit{yesterday} \rrbracket \cap \text{XN}_c(r) = \emptyset$.

The intuition behind (54) is that in any context in which *yesterday* is used, the speaker thereby signals that the distinction between things that happened yesterday and those that happened today is relevant in the context. Because of this, those that happened yesterday cannot count as “present” in the context; in other words, they cannot fall within the contextual Extended Now. In contrast, if *yesterday* is not used and the context is appropriate, events that happened yesterday may indeed fall within the Extended Now.

These ideas let us explain the crucial data above as follows. For (13), I simply maintain the explanation of the Extended Now theory. In those situations where one may naturally utter (13), it is not plausible that the event of Gutenberg’s discovery falls within the extended now of that context. This may be summarized as follows:

- (55) ??Gutenberg has discovered the art of printing.

A. Contribution of present tense:

(i) $r = u$

(ii) XN Presupposition: $e_{\text{discovery}}$ falls within $\text{XN}_c(r)$. (FAILS IN PLAUSIBLE CONTEXTS)

B. Contribution of (TSP): (irrelevant)

Matters are more interesting with (46). There the presence of the adverbial *yesterday* requires, via (54), that any events which occurred yesterday do not fall within the extended now. But this conflicts with the presupposition (53):

(56) *Mary has read *Middlemarch* yesterday.

A. Contribution of *yesterday*:

(i) e_{reading} occurred yesterday.

(ii) Presupposition: e_{reading} does not fall within $XN_C(r)$.

B. Contribution of present tense:

(i) $r = u$

(ii) XN Presupposition: e_{reading} falls within $XN_C(r)$. (CONTRADICTS
PRESUPPOSITION OF *yesterday*)

C. Contribution of (TSP): (irrelevant)

Finally, a past tense (or tenseless) case like (47)-(48) or (51) will be unproblematical because the Extended Now requirement is not applicable:

(57) Mary had read *Middlemarch* the day before.

A. Contribution of *the day before*:

(i) e_{reading} occurred the day before r .

(ii) Presupposition: e_{reading} does not fall with $XN_C(r)$.

B. Contribution of past tense: $r < u$.

C. Contribution of (TSP): $e_{\text{reading}} < r$.

To summarize, then, I propose that the prohibition against past time adverbials in present perfect sentences can be seen as resulting from a pragmatic restriction also seen in McCoard's Gutenberg example. This restriction is an Extended Now presupposition tied to the present tense. It follows that those languages which allow past time adverbials to co-occur with the present perfect would differ from English in the nature of their present tense. In this respect, I agree with Giorgi & Pianesi (1997), even though I differ from them in suggesting that this difference must be pragmatic rather than syntactic.²⁰

3.3 Current Relevance and Result State Presuppositions

In this section I will examine the non-temporal contribution of the English perfect. In section 2 we noted some facts which cannot be explained by the perfect's temporal semantics, namely the contrast between (15)a and (15)b and the oddness of (19) and (20):

(15)a ??Einstein has visited Princeton.

(15)b Princeton has been visited by Einstein.

(19) (i) Mary has lived in London for five years. (ii) ??She has become ill.

(20) ??Mary has both lived in London for five years and become ill.

In section 2 we saw how difficult it is to make clear the nature of the perfect's non-temporal interpretation. Neither the concept of 'result state' nor that of 'current relevance' seems to be applicable in all instances, nor have these concepts been made totally precise even in the cases where they do seem applicable. I believe there is considerable truth to both ideas, and aim to show that both may be captured within a single presupposition framed in terms familiar from the theory of modality.

The ideas which I will develop in this section have much in common with the discussion of current relevance by Inoue (1979), though my analysis will differ substantially enough from hers to avoid the difficulties mentioned in section 2.1. In section 3.3.1 I will focus on cases intuitively describable in result-state terms, while in 3.3.2 I will concentrate on examples which are more plausibly described in terms of a relevance requirement.

3.3.1 Resultative Readings

Let us begin by considering again (2):

(2) Mary has read *Middlemarch*.

Intuitively, this will be analyzed as: there is some current state which was caused by Mary's reading *Middlemarch*.

The most famous modal analysis of causation is that of Lewis (1973); he would analyze ‘there is some current state which was caused by Mary’s reading *Middlemarch*’ as: there is some current state which wouldn’t exist if Mary hadn’t read *Middlemarch*.

(58) would($\neg p$, $\neg \text{Pres}(s)$)

Here, p would be the proposition that Mary read *Middlemarch*. However, this treatment does not seem appropriate for the perfect. Example (2) does not really imply that if Mary hadn’t read *Middlemarch*, she wouldn’t understand Eliot’s style. If she later read *Silas Marner*, this would be sufficient to let her understand Eliot’s style; so, (58) would be predicted false. But even if we don’t know whether she read *Silas Marner*, we could be confident in the appropriateness of (2) on the basis of her reading *Middlemarch*. (Lewis would say that the cause of Mary’s understanding Eliot’s style was her reading some book or another by Eliot, not her reading *Middlemarch* or any other particular book. Perhaps this is a correct account of causation, but it doesn’t give a relation which will let us explain (2). Nor is it the intuitive causation relation, since if she read *Middlemarch* first, we’d normally be willing to say that was the cause.)

Instead, as mentioned in Section 1 I will pursue an analysis along the lines of (10):

(10) A sentence S of the form TENSE(PERFECT(ϕ)) presupposes:

$\mathbf{P}(p, \text{TENSE}(s))$.

State s must be identified by context and p is the proposition expressed by S . The precise value of the modal operator \mathbf{P} will be elucidated as we go along. Let us make a bit more explicit the kind of context in which (2) might be used to indicate that s is the state of Mary understanding Eliot’s style. We might have a conversation like the following:

(59) A: We need to get an explanation of George Eliot’s style. Who can we ask?

B: Well, George Eliot wrote *Middlemarch*, and if someone reads an author’s books, they understand her style. Unless they’re stupid of

course. Mary is smart, and she has read *Middlemarch*. So we can ask her.

The clause *she has read 'Middlemarch'* is used in this context to indicate that her reading *Middlemarch* has resulted in her being able to discuss Eliot's style. Informally, it highlights a result of her reading. I propose that we actually view this result state implication as being fundamentally epistemic in nature. At the time that *she has read 'Middlemarch'* is uttered, the following things are established in the conversation:

- (60) {If someone who isn't stupid reads an author's book, they understand her style; Mary is smart; George Eliot wrote *Middlemarch* }

This is (a subset of) the conversational background for *she has read 'Middlemarch'* in (59). If the proposition that Mary has read *Middlemarch* is added to (60), it entails that Mary can explain Eliot's style. Thus, the idea I will develop is that the perfect's presupposition is satisfied because, given this conversational background, (2) entails PRES(s), where s is Mary's ability to explain Eliot's style.

We may be a bit more precise about how the presupposition is satisfied in this case. First of all, in order for the presupposition to be well defined, the hearer A must first identify what current state s is intended. This should be fairly easy. Given that A has asked who can explain Eliot's style, he or she expects B to provide an answer to this question (or a statement that an answer will not be forthcoming). If s is taken to be the state of Mary's being able to explain Eliot's style, PRES(s) is an answer. So A has can reasonably be expected to determine the identity of state s. (This will suffice for now. There are other, perhaps more enlightening ways of looking at the status of state s within the conversation. After looking a bit a current relevance readings, we'll come back to these issues in the next subsection.) Next, the presupposition will be satisfied if the following relation holds: $\mathbf{P}(\text{'Mary read } Middlemarch\text{'}, \text{PRES}(s))$. Taking \mathbf{P} to indicate contextual entailment, this is equivalent to the requirement that $(60) \cup \{\text{'Mary read } Middlemarch\text{'}\}$ entail PRES(s). Since this entailment holds, the presupposition is satisfied.

This analysis incorporates the idea of ‘result state’ in a somewhat indirect way. The treatment doesn’t exactly say that reading *Middlemarch* caused Mary to understand Eliot’s style; rather, it says that, given what we know about the relation between reading and understanding, the fact that she read *Middlemarch* provides evidence that she understands the style. Since the relation between reading and understanding is one of causation, however, in fact the latter state is a result of her reading the novel. In general, I claim that ‘resultative perfects’ occur when the past event referred to provides evidence for the existence some current state because of a causal relation. Non-result state perfects will come about when the relation is not one of causation, as we will see momentarily.

3.3.2 *Current Relevance Readings*

Next we can move on to consider current relevance uses of the perfect. Our primary example of this type has been (3), repeated here slightly simplified:

(61) The Earth has been hit by giant asteroids before.

Suppose that (61) is uttered in a context like the following:

(62) A: Is the Earth in danger of being struck by giant asteroids?

B: Astronomical conditions aren’t very different now from what they have been in the past. And the Earth has been struck by giant asteroids before. So it’s quite possible it will happen again.

Here the current state at issue is the Earth’s being in danger of being struck by giant asteroids. The Common Ground at the time (61) is uttered contains the proposition that astronomical conditions aren’t very different now from what they have been in the past, as well as background assumptions like the idea that, if conditions are the same, the past is a good guide to the future. In this context (61) implies that the earth is presently in danger of asteroid impacts, satisfying the perfect’s presupposition (10).

The use by B of the perfect form serves an information management role within the conversation. Though the use of the past tense (*The Earth was struck by giant asteroids in*

the past) would convey virtually the same information, thus yielding a common ground which plausibly also entails an answer to A's question, it would not be functionally equivalent to the use of the perfect. The perfect's presupposition functions to highlight the fact that B's utterance, in context, serves to imply an answer to A's question. It doesn't only provide an answer; given that *s* is correctly identified, it even presupposes that it provides an answer. This point may be closely connected to Inoue's idea that the perfect stands in a logical relation to the discourse topic. Within the recent literature on topics, one prominent idea has been that a topic is in effect a question denotation, i.e. a set of propositions (cf. von Stechow 1994, Roberts 1996, Büring 1997, McNally 1997)²¹, though the question need not have been explicitly asked. It is the 'topic' for that portion of the discourse which is devoted towards providing it an answer. A topic may be broken down into several subtopics, answering each of which aids in answering the main topic. If we adopt this view of topicality, a refined version of Inoue's proposal may be stated as follows:

(63) A sentence *S* of the form TENSE(PERFECT(ϕ)) presupposes:

P(*p*, TENSE(*s*)), where

p is the proposition expressed by *S*,

P indicates contextual entailment, and

TENSE(*s*) is a partial or complete answer to *T*, the discourse topic at the time *S* is uttered.

Looking at the function of the perfect in terms of (63) presupposes a highly structured, we might say 'semantics oriented' view of discourse. It is not yet clear to me that such theories of discourse, successful as they are at dealing with constructed examples, can really capture the notion of discourse topic in all its complexity. Thus, it is worth noting that the central intuition of (63) may also be expressed within less structural, more 'pragmatics oriented' approaches. A good example is Relevance Theory (Sperber and Wilson 1995), in terms of which we might describe the situation as follows: In order to fully understand B's utterance in (62), A must first determine which current state *s* is intended as satisfying the

presupposition. The state in question must be communicatively relevant, since otherwise A could not be expected to be able to identify it. Moreover, A is justified in assuming that B would not have chosen the perfect form, as opposed to the simple past, unless invoking the presupposition that it triggers increases relevance. In the case at hand, it is a fairly trivial task for A to figure out that *s* is the state of the Earth's being in danger of being struck by giant asteroids. B's goal of highlighting for A the fact that the original question, *Is the Earth in danger of being struck by giant asteroids?*, has been answered is thus achieved via A's process of unraveling the presupposition and making certain that it is satisfied.

This discussion makes clear how the presupposition of the perfect helps to differentiate it from the simple past. At first glance, it may seem odd to focus on the result state/current relevant presupposition as something special to the perfect. After all, past tense sentences may be used in similar ways. For example, *The Earth was struck by giant asteroids in the past* could serve to indicate the very same current state which the perfect sentence would. Given this, how can we say that presupposition (10) characterizes something distinct in the perfect's meaning? What this objection misses is that, while the past may function to indicate a current result/relevant state, it does not linguistically presuppose that it does so. This makes for at least two significant differences. On the one hand, a simple past tense sentence, but not the perfect, may be used as part of a simple narrative, a story about the past, and describe an event which in and of itself has no particular current relevance. (The narrative as a whole might be required to be relevant, by some general pragmatic principle, but the particular event would not be.) And on the other, a speaker can use the perfect in a situation in which it is not obvious how the presupposition is satisfied in order to prod the hearer into uncovering (and accommodating) the current state that he or she has in mind. For example, out of the blue (64)a below would suggest that the speaker is still ill, while (64)b would not necessary do so:

(64)a I have been diagnosed with cancer.

(64)b I was diagnosed with cancer.

The two examples differ because (64)a requires that the event of diagnosis itself be specifically relevant to the present; an obvious way in which it can be relevant is because it provides evidence that the speaker is currently ill. (In terms of the question-based theory of discourse topics, we might say that the question ‘How are you?’ is implicit.) (64)b allows this possibility as well, but it is also compatible with the speaker’s just wanting to tell the story of his or her treatment and cure. In such a case, though there would undoubtedly be plenty of current states which result from the speaker's being diagnosed with cancer, such as having a scar from surgery or enjoying a renewed appreciation of life, he or she has chosen not to mark them via presupposition. In other words, the mere fact that the conditions hold which would allow a presupposition to be satisfied does not require that it be marked; there is communicative value to marking, or not marking, a presupposition, and therein lies part of the contrast between perfect and past.

My proposal that current relevance uses come from the interaction between perfect sentence and the Common Ground means that a special situation arises when the Common Ground is close to empty, as at the start of a conversation. In such cases, the present theory implies that one of two situations holds: either a very weak common ground suffices to allow the perfect’s presupposition to be satisfied or the common ground is not as impoverished as it seems. Examples of the first type are so-called ‘hot news’ perfect like (6):

(6) The Orioles have won!

This sentence may be said even to a complete stranger, but in such instances reveals the speaker’s assumption that everyone shares his or her concern for the fate of the Orioles baseball team. The second type of ‘out of the blue’ perfect can be exemplified by (65):

(65) Several terrible things have happened to me this week.

This example has the feel of resuming an already-established correspondence or catching up with a friend. That is, it invokes a previously existing Common Ground, and suggests that in that context, the several things that happened have some relevant consequences.

While it is obviously impossible to discuss the full variety of ways in which the presupposition of a perfect sentence may be satisfied in specific contexts, before closing this section I would like to discuss two varieties of examples which at first glance seem to lack such a presupposition entirely. First, we have sentences of the form ‘X TENSE have been to Y’:

(66) I have been to London.

It is not obvious that the speaker here has in mind any specific, relevant current state which follows from his or her time in London. I would point out, however, that the compositional structure of this type of example is not at all clear. Corresponding sentences not in the perfect form are ungrammatical, as shown below:

(67) *I was/am/will be to London.

This shows that sentences of this type do not result from an ordinary combination of the perfect with a VP of the form *be to Y*. Instead, they may well be an idiosyncratic, non-compositional construction, one whose precise nature remains to be elucidated. In any case, it is not wise to draw firm conclusions about the perfect from examples like (66).

Continuative perfects like those in (68) might also seem to undermine the claim that perfect sentences always create a presupposition of the sort described above:

(68)a I have lived in London for six years.

(68)b I have been sitting here for an hour.

It is not at all obvious that (68)a, for instance, conveys anything more than what it says: the speaker’s residency in London began at least six years ago, and continues unabated. In these cases, I would like to suggest, the perfect’s presupposition is trivially satisfied by the very state it asserts. That is, (68)a asserts that the speaker resides in London (and that this residence started at least six years ago). The state of residency itself may be identified as the currently state s mentioned in the presupposition (10). In this case, the fact that this state currently holds trivially follows from (68)a, and so the perfect’s presupposition is automatically satisfied. (Note that I’m not proposing that the sentence asserts what it

presupposes; rather, the state whose existence it asserts allows the satisfaction of the presupposition that a certain modal relation holds.) Given that only perfects formed of statives may receive continuative readings, it follows that only these cases can trivialize the perfect's presupposition in the way illustrated by (68).

3.4 Comparison with Other Theories

This section will discuss a variety of examples which were seen in section 2 to be problematical for other theories of the perfect. This will make clear the points at which the present analyses has an empirical advantage over these alternatives.

Continuative perfects are problematical for the indefinite past theory, since it appears that in such examples the eventuality described by the sentence need not be completely past. While Klein dealt with examples like (4), repeated below, by considering *for five years* to have scope under the perfect, such an solution did not seem applicable to cases like (11).

(4) Mary has lived in London for five years.

(11) Mary has lived in London since 1966.

For Klein, the problem with (10) is that a *Mary-lives-in-London-since-1966* event would extend to the speech time, and so could not fit with his indefinite past semantics. As discussed in the last subsection, this type of sentence is unproblematical on the present approach. The (TSP) allows temporal overlap in this case, while the portion of Mary's residency in London which falls within the Extended Now may count as the current state satisfying the perfect's presupposition.

Another difficult example, for both the indefinite past and result state theorists, was (13):

(13) ??Gutenberg has discovered the art of printing.

As discussed in section 3.2, I would analyze this example in the same terms as the Extended Now theory: in the most natural situations in which we can imagine this sentence being used, the event of Gutenberg's discovery is too far in the past to fall within a plausible

Extended Now. We usually think about him in the historian's frame of mind, and it is the job of historians to study the past. Sentence (3) might be seen as throwing doubt on this reasoning, since it requires an Extended Now much longer than that of (13), but of course the two suggest very different contexts:

(3) The Earth has been hit by giant asteroids before (and it probably will again). Example (3) suggests an astronomer's frame of mind, and from that point of view there may be no relevant boundary between a million years ago and today. In addition, I take *before* here to play a role here. It is most naturally pronounced with focal intonation, and its contrast interpretation (the past vs. the future) is clear from the parenthetical. All of this points to the fact that this sentence is naturally produced in a context where the Extended Now includes the whole past, so that any non-future event falls into it. The point of (3) is precisely that that ancient era when asteroids hit the Earth ought to count as present for the purposes of the conversation at hand, e.g. deciding whether to build an asteroid defense network. Furthermore, *before* generates an implicature that events of the type described by the sentence could occur in the future (cf. the presupposition of Mandarin *guo* discussed by Yeh 1996). This is fine for (3), but not for (70), since Gutenberg is dead:

(70) ??Gutenberg has discovered the art of printing before.

On the other hand, (67) is fine:

(71) The art of printing has been discovered before (and probably will be again). This sentence could be felicitously used if through some calamity civilization is reduced to a pre-printing state. Some wise individuals realize that there was such a thing in the past, and they expect that as civilization recovers it will be invented again.

The primary argument against the Extended Now Theory was its difficulties with (19):

(19) (i) Mary has lived in London for five years. (ii) ??She has become ill.

In the present terms, (ii) it bad for the same reason that Result State theories say it is. In the scenario envisioned, there is no easily identifiable, relevant present state which follows from

her being ill. As mentioned above, the past is used for simple narratives where no special relevance to the discourse topic is worth marking. If we imagine a context where there is a present state related to the discourse topic and her past illness in the right way, (ii) will be acceptable. For example, suppose that those Londoners who have become ill in the last few years are advised to go see their doctors, as the illness may have been due to recent dumping of toxic waste in their city. (The discourse topic might be something like ‘Which of our friends might need to go see their doctors due to these revelations about toxic waste?’) In such a context (19) would be fine, indicating that Mary ought to seek medical attention.

Finally I would like to return to the ‘lifetime effects’ illustrated by (15):

(15)a ??Einstein has visited Princeton.

(15)b Princeton has been visited by Einstein.

My explanation of this contrast is very similar to Inoue’s. Recall her idea that (15)a is naturally associated with an implicit discourse topic like *Talking about Einstein’s visits to American universities*, while (15)b might be more naturally connected with *Talking about Nobel Prize winners visiting Princeton*. Then she claims that the topical proposition must be ‘repeatable’ at the speech time, so that (15)a presupposes that Einstein could visit Princeton again. Above we considered the possibility that the ‘discourse topic’ is an implicit question denotation, not a single proposition. In these terms, we would rephrase her account by saying that (15)a is most naturally associated with the topic ‘Where has Einstein visited?’, while (15)b suggests ‘By whom has Princeton been visited?’. This contrast makes sense if we take into account the relationship between question/answer relations and focus. Assuming that the default focus in English falls within the VP (and on the object, when there is one, rather than the verb), out of context (15)a’s focus structure is naturally taken to be *Einstein has visited* [_F Princeton] or *Einstein has* [_F visited Princeton]. These focus structures are appropriate for answering the questions ‘Where has Einstein visited?’ or ‘What has Einstein done?’, respectively. Parallel remarks hold for (15)b. Out of context, these two sentences therefore suggest different discourse topics.

In light of this, the lifetime effect follows from the perfect's Extended Now presupposition. (13)a presupposes that Einstein's visit occurred within the Extended Now. Moreover, in the context of the topic *Where has Einstein visited?* or *What has Einstein done?*, it is natural to assume that the conversation pertains to Einstein's personal history, or at least some aspects of it. In a conversation about Einstein, his death provides a natural boundary between the 'present', i.e. the Extended Now, and the 'past', the time before the Extended Now. Hence, we may conclude that the speaker does not have knowledge of Einstein's death. In the context of another discourse topic, (15)a might not license the same conclusion. For example, Inoue's context (14) makes explicit the topic *Which Nobel Laureates have visited Princeton?*, and as an answer to this question the focus in (15)a would be on the subject rather than in the VP. This conversation is not focused particularly on Einstein, but rather on Nobel Laureates in general, and so his death does not place a natural limit on how far back the Extended Now may stretch. The context could provide an Extended Now covering all of Princeton's modern history, for example. In this case, Einstein's visiting Princeton would indeed fall within the Extended Now, and so (15)a would be fine. Similarly, in the absence of any additional context, (15)b's discourse topic, *By whom has Princeton been visited?*, also suggests a long Extended Now having nothing to do with whether Einstein is alive or not.

4. SUMMARY REMARKS

The theory which has been outlined in this paper combines ideas from its Indefinite Past, Result State, and Extended Now predecessors. The major components of the analysis may be summarized as follows:

Temporal Components:

- (i) The temporal relation between the event described under the scope of the perfect and the reference time is determined by the general Temporal Sequencing Principle as well as the temporal adverbials present;

- (ii) The present tense requires that the event time of a present perfect sentence must fall within the Extended Now;
- (iii) Adverbial elements introduce presuppositions concerning the identity of the Extended Now.

Modal Components:

- (iv) Perfect sentences are subject to a flexible result state/current relevance presupposition;
- (v) An epistemic operator, relating a contextually specified current state to the proposition under the scope of the perfect, is able to provide precise content to the notions of 'result' and 'relevance' applicable to the perfect, as well as to unify the two cases under a common presupposition.

This analysis formalizes the intuition that the perfect is used to provide information about one time by citing what happened at another, earlier one. The kinds of relationship which may hold between these two times are quite varied, however, in both temporal and non-temporal terms. This account specifies a number of semantic constraints on the relationship while at the same time giving a great deal of weight to pragmatic factors.

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NOTES

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¹ Note that this contrast cannot be attributed simply to some pre-theoretic notion of ‘plausibility’. With regard to (2), for example, there is no reason why the activity of reading could not extend from some time a few days or weeks ago up through the speech time. Such a situation could be described using the progressive: *Mary has been reading ‘Middlemarch’*.

² The idea here is very similar to that of Inoue (1979), whose analysis we will return to in more detail below.

³ This differs from the repeatability condition noted by Yeh (1996) for Mandarin *guo*. According to Yeh, *guo* requires that an event of the kind described by the perfect sentence itself be repeatable, a requirement clearly too strong for the English perfect.

⁴ Another difficulty for the metonymy approach arises from sentences like

- (i) Each philosopher has contributed a lot to the thinking of scholars in his or her home country.
- (ii) Frege has contributed a lot to my thinking. He wrote in a fairly abstruse style, however.

Metonymic interpretations will not provide suitable antecedents for the pronouns.

⁵ This possibility was brought to my attention by Manfred Krifka. As mentioned above, Inoue (1979) relates the use of the perfect to the discourse topic, but takes topics to be propositions, not entities. The intuition that topicality is relevant to lifetime effects is shared by these two approaches, but the implementations are quite different.

⁶ Of course this example may be used to indicate concrete results of the ancient impacts. My point here is simply that it need not. The adverb *before* and parenthetical *it probably will be again* tends to favor the type of context I wish to focus on.

⁷ Anagnostopoulou et al. Talk about the ‘perfect interval’, but this seems to be another name for the Extended Now. They focus on deriving continuative vs. existential readings from the underlying Aktionsart and the nature of the adverbials present.

Spejewski’s paper, confirmed by personal communication, suggests that she might support incorporating some type of ‘result state’ idea into the Extended Now approach. However, her analysis does not do this as it stands, so I will discuss it along with the other Extended Now analyses.

⁸ The simple sequence *Mary has lived in London for five years. She became ill.* is only completely natural if the time of her claimed illness is definitely established in the context. So, in the scenario given, the hearer must know that the time when she might have gotten ill is three years ago. Such a context is not sufficient to make the perfect acceptable.

⁹ Things become more difficult when the *if* clause proposition is incompatible with the conversational background. See the literature cited for details on the solutions one might pursue. Matters are a bit different when it comes to the present analysis of the perfect, however, since the proposition which plays this role, *p* in (25), is actually asserted. Thus, if it happens to be incompatible with the epistemic conversational background, this must be dealt with in whatever way one normally deals with cases where newly asserted information contradicts what is assumed. It is therefore a problem not specific to the analysis of modality or the perfect, but rather requires a general pragmatic account of conversational update.

¹⁰ The difference cannot be explained by simply claiming that a simultaneous reading is implausible with eventive complements. With *Mary realized that John built a boat*, the duration of the embedded clause’s reference time (Mary’s realization) is quite short in relation to the duration of its event time (John’s building the boat). Thus, it would certainly be possible for the two to be in the same kind of relation as *Mary realized that John was sick*. However, the simultaneous reading is only possible in the latter case.

¹¹ The system of von Stechow (1997) seems to assume that embedded tenses always delete. Specifically, he says that the tense of a subjunctive clause always deletes, and suggests that all embedded clauses are subjunctive. However, he makes assumptions about the interpretation of tense similar to Ogihara’s. It is not clear to me, then, how shifted readings are supposed to arise. If they arise due to the lack of deletion, he would have to say that the subjunctive is typically optional in English. At that point it is unclear what advantage accrues to appealing to the subjunctive, as opposed to simply saying that deletion is optional.

While it's usefulness for dealing with the English facts can be called into question, there is evidence that subjunctives do correlate with simultaneous readings. Consider the following from Italian:

- (i) Gianni sapeva che era incinta (nel 1995).
Gianni knew that was-indic. pregnant in-the 1995.
'Gianni knew that she was pregnant (in 1995).'
- (ii) Gianni pensava che fosse incinta (*nel 1995).
Gianni thought that was-subj. pregnant in-the 1995.
'Gianni thought that she was pregnant.'

Example (ii), with a subjunctive complement, has only a simultaneous reading, in contrast to the indicative in (i), which has both the simultaneous and shifted readings (the latter clearest with the past adverbial 'in 1995'). This supports von Stechow's idea, at least for Italian. However, further consideration shows that it is not the subjunctive in (ii) which forces the simultaneous reading. If we trigger a subjunctive with the adjective *contento*, a shifted reading is still possible:

- (iii) Gianni era contento che il tempo fosse bello nel 1995.
Gianni was happy that the weather was-subj. pretty in-the 1995.
'Gianni was happy that the weather was pretty in 1995.'

Similarly, triggering a subjunctive by negating the matrix clause in (i) continues to allow a shifted reading. Thus, the contrast between simultaneous and shifted reading cannot be attributed to mood choice. It is likely, however, that the two phenomena are sensitive to some of the same factors, and that this explains their partial correlation.

¹² Moreover, I would like to suggest, albeit tentatively, that the (DTSP) can subsume the (TSP). This can be accomplished compositionally, by identifying the single reference time *r* mentioned in the original (TSP) with the *r*-out of the (DTSP). Consider (i):

- (i) John said that Mary read *Middlemarch*.

Suppose that the *r*-out of the embedded clause is linked to the *r*-in of its matrix. Thus, the embedded *Mary read 'Middlemarch'* establishes an output reference time r_1 -out which follows the event time of reading, by the (DTSP); r_1 -out is identified with the input reference time r_2 -in of the main clause, and it therefore overlaps the time of saying. In this way, John's saying time is ensured to follow the time of Mary's reading. In addition, the root clause's r_2 -out must follow the time of saying, and is required to precede the speech time by the matrix clause's past tense. If (i) is embedded in a larger context, its r_2 -in and r_2 -out are related to the reference times of sentences in the surrounding discourse in the ways illustrated with (33)-(35). Obviously, these remarks are too brief to be anything but suggestive, but as the issue of whether the (DTSP) and (TSP) can be fully unified is rather tangential to my main point, they should suffice.

¹³ Whereas Michaelis treats the resultative use as on a par with continuative and existential ones, in my analysis the resultative/current-relevance contrast is an parameter of variation independent of the temporal (existential/continuative) contrast. Since I only claim that aspectual class is relevant to the perfect's temporal interpretation, I can agree with Michaelis' point that aspectual features of a sentence are irrelevant to whether it has a resultative reading or not. Here the only issue is their relevance to temporal interpretation.

¹⁴ To be a bit more precise, (38) has no reading entailing that Mary still lives in London, although it is compatible with her currently living there. Moreover, in many contexts it implicates that she does not live in London any more, since the present tense *Mary lives in London* would be more informative, if the fact that she now lives in London is relevant. This implicature is defeasible, however, since (38) may be followed by *and in fact she may still live there*.

¹⁵ A progressive does not require the adverbial for a continuative reading, and lacks a non-continuative reading:

- (i) Mary has been living in London.

I do not have a detailed explanation to offer for this difference, though it suggests that the covert *for* phrase to be discussed below can escape existential closure in progressive sentences. This behavior of progressives should be related to the fact, pointed out by Smith (1991), that progressive sentences differ from other statives in not allowing inchoative readings (examples from Glasbey 1998):

- (ii) When I arrived, Fred was phoning the police.
- (iii) When I arrived, Max was happy.

In (iii), Max's happiness may begin with my arrival, but with (ii), Fred's phone call may not. Note that the facts illustrated in (i)-(iii) further support the idea that the temporal relationships indicated by the perfect have the same source as temporal sequencing in discourse.

¹⁶ The reading in (44) would implicate, by Grice's Maxim of Quantity, that the more specific (43) is false.

¹⁷ Note that I agree with Michaelis (1998) that (some) perfect sentences are ambiguous, but I treat this as a structural ambiguity, while she treats it as a lexical ambiguity of the perfect form itself.

¹⁸ It may well be that these ‘indefinite’ adverbials fit into the semantics in a different way from ‘definite’ ones. The present case is plausibly analyzed as containing a covert adverb of quantification, something similar to *at least once*, so that the clause has a semantic structure as follows:

(i) at-least-once(on Saturday)(I have been to mass at St. Thomas)

Here *on (a) Saturday* is an argument of the adverb of quantification, entering the semantic composition at a higher level than the minimal tensed clause, and as such might not be expected to interact with the perfect or present tense at all.

¹⁹ For simplicity I follow a Reichenbachian model of the semantics of the simple present tense. Though Reichenbach did not address the compositional details, this could mean that the perfect alternates with a null [-perf] morpheme which introduces the requirement that *r* and *e* coincide.

²⁰ Recall that Giorgi & Pianesi propose that so-called present tense sentences in languages like Italian are actually tenseless. This idea is actually compatible with the approach taken in this paper, since if there is no present tense, there will be nothing to carry the extended now requirement. However, we need not be so radical as this.

²¹ This ‘topics as questions’ theory of topicality is to be distinguished from the ‘topics as entities’ theory (cf. Portner & Yabushita 1998). Here we will make use of the former, whereas in section 2.2, as we considered alternative versions of the result state semantics for the perfect, we made use of the latter. Those versions of the result state view which make reference to (entity) topics may be seen as sharing Inoue’s insight that topicality is crucial to our understanding of the perfect, in particular lifetime effects, while pursuing a very different implementation of this basic idea. I suspect that both approaches to topicality are necessary for the analysis of language, and so the only question here is which is more appropriate for analyzing specific facts pertaining to the English perfect.