

# What Is a Perfect State?

Atsuko Nishiyama and Jean-Pierre Koenig

*University at Buffalo, the State University of New York*

## 1. Introduction

The perfect is often said to introduce a state into the discourse (Parsons 1990; Michaelis 1998; de Swart 1998). More precisely, sentences in the perfect introduces two eventualities, an event  $e$  described by the main verb and its arguments and which precedes reference time (hereafter, the prior eventuality), and a state  $s$  which overlaps reference time and is related to the prior eventuality  $e$  (hereafter, the perfect state). For example, (1) introduces the event of Ken's breaking his leg and (1a) and (1b) are two possible perfect states.

- (1) Ken has broken his leg.
  - a. Ken's leg is broken.
  - b. Ken is behind in his work.

No consensus exists on the properties of the perfect state  $s$  and the relationship between the category of the perfect state  $s$  and the prior eventuality  $e$  has not been adequately characterized. The goal of this paper is to elucidate this relation. We propose, first, that the perfect semantically includes a free property variable for the category of the perfect state. Secondly, we argue that the value of this property variable is determined pragmatically and that the relation between the prior eventuality and the perfect state is epistemic: The perfect state must be mutually inferable from the prior eventuality description through I-Implicatures (Levinson 2000).

## 2. Various readings of the perfect

Our analysis of the perfect differs from previous analysis in that it claims that the perfect marker is both monosemous *and* a stativizer. Previous analyses either regarded the perfect as a stativizer, but argued for its ambiguity or claimed it was monosemous, but not a stativizer. In this section we provide a brief overview of previous accounts of the perfect. Space considerations prevent us from a thorough critical review of this literature. Our goal in this section is more modest, lay out the various readings traditionally recognized that our analysis must account for pragmatically and briefly justify, when relevant, why we think the perfect is an unambiguous stativizer.

Several different readings of the perfect have been recognized and these distinct readings follow from three possible dichotomies. The first dichotomy separates lexically entailed resultative and existential perfect readings (see A in Table 1).

Table 1: The classifications of perfect readings

readings	lexically entailed resultant state	Implicated resultant state	no resultant state	input state continues
A <sup>A</sup>	Resultative <sup>1</sup>	Existential <sup>2</sup>		Continuative (Universal)
B <sup>B</sup>	Resultative		Existential	
C <sup>C</sup>	Existential			
D	Perfect			

<sup>A</sup> McCawley (1971), Kiparsky (2002)

<sup>B</sup> Michaelis (1998)

<sup>C</sup> Mittwoch (1988), Kamp and Reyle (1993), Portner (2003)

<sup>1</sup> ‘Target State’ perfect readings in Parsons (1990).

<sup>2</sup> ‘Resultant State’ perfect readings in Parsons (1990), ‘permanent state’ in ter Meulen (1995).

The perfect in (2) can be interpreted as indicating that the resultant state—*Ken’s leg is still broken* (2a)—, lexically entailed by the verb *broken*, (the ‘direct resultant state’ of (McCawley 1971)) holds at present. Alternatively, it can be interpreted as the existential perfect reading that there was an instance of the event-type *Ken break his leg* in (2b).

- (2) a. Ken has broken his leg. (His leg is still broken.)  
 b. Ken has broken his leg, but he is OK now. (His leg is cured.)

The second dichotomy separates resultative (whether lexically entailed or not) and existential (experiential) perfect readings (B in Table 1). Some scholars base the distinction on whether a perfect sentence has resultant state implications or present possibility presuppositions. For example in (1), both (1a) and (1b) have resultant state implications; those readings are therefore considered to be resultative perfect readings. On the other hand, because existential perfect readings carry ‘present possibility’ presuppositions (Curme 1935; McCawley 1971; Inoue 1979; Michaelis 1998), (3) is argued to be odd because Einstein’s visit of Princeton cannot be repeated at present.

- (3) (\*)Einstein has visited Princeton.

Note however that whether or not existential perfect readings carry an idea of “present replicability”, that constraint does not behave like a presupposi-

tion. Whereas presuppositions can typically be negated by a metalinguistic negation (Horn 1985), “present replicability” seems immune to metalinguistic negation. Thus, whereas the first sentence in (4) negates the presupposition of the king of France’s existence; the repeatability of the event or some construed event type related to Einstein’s visit of Princeton (Michaelis 1998) cannot be negated in (5).

- (4) The king of France is not bald. There is no king in France.
- (5) \*Einstein has not visited Princeton. He is not alive.

Identity tests (conjunction reductions, pronominalization, ‘the same thing’-test, and so on) have sometimes been suggested as tests for the ambiguity of the perfect between a resultative and an existential reading (McCawley 1971; Michaelis 1994; Michaelis 1998). Consider sentences (6)-(8).

- (6) Max has been fired.
- (7) Max has been fired, and so has Fred.
- (8) Max has been fired and Fred has been fired.

(6) is argued to be ambiguous, not vague, because (7) does not allow a crossed-interpretation. That is, (7) cannot be used to assert both that Max was fired at some point in the past and that Fred is currently out of work as a result of having been fired. However, the unreduced sentences themselves do not allow the crossed interpretation, as (8) shows. The absence of a crossed interpretation of (7) cannot therefore be attributed to an identity-of-sense constraint on VP ellipsis (see Zwicky and Sadock (1975)). The absence of crossed interpretation must be due to some pragmatic factors, rather than semantic ambiguity, as McCoard (1978) already notes.

The third dichotomy separates continuative (universal) and non-continuative (existential) perfect readings of stative predications as seen in (9) (C in Table 1).

- (9) Ken has been sick.
  - a. Ken is still sick.
  - b. Ken is not sick any more.

Under a continuative reading (see (9a)), (9) says that for all time intervals from a given point in the past to the present (reference time) Ken’s sickness holds. Under an existential reading, all that (9) is saying is that there exist one or more occurrence of the denoted situation during the period from a given point in the past to the present<sup>1</sup>.

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1. Some scholars say that continuative perfect readings are only available when

Although we suggested that they do not correspond to different *meanings* of the perfect, it is important to keep these various readings in mind as we present our analysis. Any adequate theory of the perfect must account for how these different interpretations arise in context.

**No perfect state?: Extended Now and other temporal theories of the perfect** Not all analyses of the perfect assume that the perfect is a stativizer or introduces a perfect state. In Extended Now (hereafter, XN) and other temporal theories of the perfect, the perfect does not introduce a state (McCoard 1978; Inoue 1979; Klein 1992; Klein 2000; Portner 2003). The XN theory requires that the event described in a present perfect falls within an ‘Extended Now’ time interval (McCoard 1978; Mittwoch 1988; Portner 2003). Clearly for there to be a distinction between the present perfect and a simple past tense in this view, the length of the extended now interval must be limited. Indeed, the XN theory explains that (10) sounds odd because the event of Gutenberg’s discovery of the art of printing does not fall within an “extended now” interval, while (3) is acceptable in some contexts because the event of Einstein’s visiting Princeton can fall within an “extended now” interval (McCoard 1978; Portner 2003). However, the “extended now” interval seems to be able to be quite long. (11), for example, sounds natural in the context of a course on the history of philosophy, even though Plato’s discovery happened earlier than Gutenberg’s. If the time span of “extended now” is restricted at all, it does not seem that the restriction is temporal.

- (10) ??Gutenberg has discovered the art of printing. (McCoard 1978; Portner 2003)
- (11) Plato has discovered the existence of a priori knowledge. (Attested)

Another drawback of the XN theory is that it is not clear why *have* occurs in the simple present if the perfect does not describe a state or is not a stativizer. As is well-known, the English present tense is incompatible with episodic readings of event descriptions, except in speech acts or sports caster contexts (Michaelis 1998). No such constraint restricts the use of the present with state descriptions. The fact that the perfect auxiliary *have* can bear present tense in episodic contexts is therefore immediately accounted for under analyses of the perfect that hypothesize it introduces a perfect state. It remains unexplained in the XN theory.

The incompatibility of past time adverbials with English present perfects, is often argued to favor the XN Theory, but this incompatibility does the perfect cooccurs with temporal adverbial phrases such as *for-* or *since-* phrases (Mittwoch 1988). Our consultants, however, do not corroborate this claim. (9) can receive both continuative and non-continuative readings despite the absence of temporal adverbial phrases.

not extend to perfects cross-linguistically<sup>2</sup>. For example, both German and Japanese perfects can cooccur with past time adverbials, as seen in (12) and (13), respectively.

- (12) *Gestern um zehn habe ich den Brief abgeschickt.*  
 Yesterday at ten have I the letter sent off  
 ‘%<sub>Ger</sub>I have sent off the letter at ten yesterday.’ (Klein 2000)
- (13) *Kare-wa kyonen Kyoto-ni i-tte-i-ru.*  
 He-TOP last year Kyoto-to go TE-I-NONPAST  
 ‘%<sub>J</sub>He has been to Kyoto last year.’<sup>3</sup>

Klein (1992) and Klein (2000) present another theory of the perfect that does not assume perfects introduce states. In Klein’s view, all that the perfect introduces is a post-situation temporal interval (Topic Time). But it seems that the very notion of Topic Time (TT)— an interval about which an assertion is made—, requires something like an eventuality (possibly a state) to be introduced by the perfect. Without anything to assert, how can there be an interval of time about which an assertion is made? When seen in this light, Klein’s theory reduces to a variant of perfect state theories

We conclude this section with the following observation. Some scholars claim that in addition to asserting that an eventuality occurred within the “extended now” interval, the perfect carries a presupposition that some type of topic (or topic relation) should already be in the discourse context (Inoue 1979; Portner 2003). However, the fact that a sentence containing a perfect can be uttered felicitously out of the blue, e.g., (14), suggests that no such presupposition is attached to the use of the perfect.

- (14) Prof. Smith has left his keys on the table. We should take them to him.

To sum up, accounts of the perfect which do not assume its stativity are not entirely successful and we thereon assume the correctness of perfect state theories.

**Previous views on the perfect state** There is considerable uncertainty on both the nature of the perfect state and its relation to the prior eventuality.

2. English present perfects can also co-occur with past time adverbial phrases in certain contexts.

i. We have already discussed this affair at some length last night. (McCoard 1978)

3. The symbols ‘%<sub>Ger</sub>’ and ‘%<sub>J</sub>’ mean that the English translations are not acceptable in English but the corresponding sentences are acceptable in German and Japanese, respectively.

Some scholars have regarded the perfect state (*s*) as a state abutting on the described event (*e*) (Kamp and Reyle 1993; de Swart 1998). According to this view, the perfect state *s* starts when the prior eventuality *e* ends, and the abutting relation between *e* and *s* is purely temporal. Others have regarded the perfect state as a consequent state resulting from *e*'s occurrence (Moens and Steedman 1988; Smith 1997). A causal relation is assumed to exist between the prior eventuality and the perfect state. Finally, others regard the perfect state as equivalent to the permanent state of the event having occurred (Galton 1984; ter Meulen 1995), on the basis of the fact that the end of an event can always entail the beginning of the permanent state of the event's having occurred.

Difficulties plague all three models of the nature of the perfect state. We illustrate these difficulties on the following examples.

- (15) Ken has broken his leg.
  - a. His leg is broken (*s*)
  - b. Ken is behind in his work (*s*)
  - c. #Susan is married (*s*)
- (16) I have seen the key in this room.
  - a. The key is in this room (*s*)
- (17) I've been in London since last week.
  - a. I am in London (*s*)

(15a), (15b), (16a) and (17a) are possible perfect states for (15)-(17) under the received analyses, while (15c) cannot count as a perfect state in normal contexts.

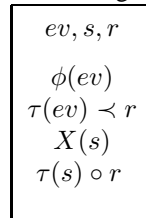
The first view, i.e., that the relation between the prior eventuality and the perfect state is one of temporal abutment cannot exclude a temporally coincidental state that is unrelated to *e*. For example, it cannot exclude (15c) as a perfect state for (15) when the state of Susan's being married starts at the very moment at which Ken's breaking his leg ends. It cannot either generally account for implicated resultant states (Depraetere 1998) since implicated resultant states do not necessarily start when the described event ends. For example, the state of Ken's being behind in his work (15b) as a resultant perfect state for (15) does not have to start when the event of Ken's breaking his leg ends. The second view, i.e., that the perfect state is a consequent state, cannot explain that (16a) does not result from the event of the speaker's seeing the key. In other words, the prior eventuality and the perfect state are not always causally related. The third view, i.e., the perfect state is the permanent state of the prior eventuality's having occurred, cannot explain that the perfect states in (15a), (15b), (16a) and (17a) are not permanent. In order to capture those

interpretations, the perfect must be allowed to introduce another state besides that permanent state. In sum, previous views on the nature of the perfect state and its relation to the prior eventuality can explain some of the perfect uses, but not all. The next section proposes a unified analysis of the relationship between the prior eventuality and the perfect state as well as of the category of the perfect state.

### 3. The meaning and interpretations of the perfect

We propose that the meaning of the perfect introduces (i) an eventuality  $ev$ , whose temporal trace precedes a reference time  $r$  (speech time  $n$  in present perfects) ( $\tau(ev) \prec r$ ), and (ii) a perfect state  $s$ , which overlaps a reference time  $r$  ( $\tau(s) \circ r$ ) and whose category is inferable from the occurrence of  $ev$ . The eventuality  $ev$  can be any type of eventuality, including states. Within Discourse Representation Theory (DRT) (Kamp and Reyle 1993; de Swart 1998), Figure 1 shows the discourse representation structure (DRS) of the meaning of the perfect.  $\phi$  stands for the eventuality description contributed by the main verb+its arguments and the prior eventuality  $ev$  satisfies the description  $\phi$ .

Figure 1: The meaning of the perfect



We also propose that the category of the perfect state  $s$  is semantically a free variable, as seen in (18) ( $X$  in Figure 1), which must be filled in by the addressee (see Kay and Zimmer (1978) and Partee (1984) on the use of property variables in semantics).

$$(18) \quad X(s)$$

The free variable  $X$  is a semantic constraint (imposed by the perfect form), but the value of  $X$  has to be filled in via pragmatic inferences. The only constraint on  $X$  is that it be inferable from an occurrence of  $ev$ . The inferential process by which the value of  $X$  is determined can be modeled via the principle of informativeness (I-Principle) (Levinson 2000) (see also the notions of Q- and R-implicatures in Horn (1984)). The I-principle consists of a speaker's maxim of Minimization and a hearer's pragmatic enrichment as its corollary.

$$(19) \quad \text{I-principle:}$$

1. A speaker chooses the less informative utterance ( $q$ ) when the more informative one ( $p$ ) is available (maxim of Minimization).
2. The addressee enriches the less informative utterance into the most *specific* interpretation, making use of world knowledge.

For example, the meaning of (20) is formalized as (21). The more informative utterances (21a) and (21b) are available, but when a speaker chooses to utter (20), following the maxim of Minimization, the hearer enriches the less informative utterance into  $p$  or  $p'$ .

- (20) Ken has broken his leg. ( $=q$ )
- (21)  $\exists e \exists s [\text{Ken\_break\_his\_leg}(e) \wedge X(s) \wedge \tau(e) \prec n \wedge \tau(s) \circ n]$
- a. Ken has broken his leg and Ken's leg is broken. ( $=p$ )
  - b. Ken has broken his leg and Ken is behind in his work. ( $=p'$ )

We cannot detail here the reasoning *process* through which the value of  $X$  is inferred. We merely show how the various readings of the perfect for (20) discussed in section 2 correspond to different kinds of values  $X$  can take. For example, lexically entailed resultative perfect readings obtain when the value of  $X$  is 'Ken's leg be broken,' as shown in (22), while conversationally implicated resultative perfect readings, i.e., non-entailed resultative perfect readings, obtain when the value of  $X$  is, e.g., 'Ken be behind in his work', as seen in (23).

- (22) Lexically entailed resultative perfect reading:  
 $X(s) = \text{Ken's\_leg\_be\_broken}(s)$
- (23) Conversationally Implicated resultative perfect reading:  
 $X(s) = \text{Ken\_be\_behind\_in\_his\_work}(s)$

Existential (non-resultative) perfect readings obtain when the value of  $X$  is, e.g., 'Ski jumps be difficult' or 'Ken's breaking his leg have occurred,' as seen in (24), depending on one's definition of existential readings. The latter interpretation corresponds to the logical permanent state of an event having occurred that we just discussed.

- (24) Existential (non-resultative) perfect reading:  
 $X(s) = \text{Ski\_jumps\_be\_difficult}(s)$   
 $X(s) = \text{Ken's\_breaking\_his\_leg\_have\_occurred}(s)$

Finally, the value of  $X$  cannot be determined as 'Susan be married', because this value is not inferable from the occurrence of the event of Ken's breaking his leg in normal contexts.

- (25)  $X(s) = \# \text{Susan\_be\_married}(s)$   
 (The value is not inferable from  $e$ 's occurrence.)

Since the meaning of the perfect can take any eventuality description *ev* as its input, including a state, when the input eventuality description is stative, the value of *X* may be of the same category as that of the prior eventuality. When this occurs— i.e., when the category of the perfect state is that of the prior eventuality—, we are dealing with what is typically labeled continuative perfect readings. For example, the meaning of (26), represented as (27) can lead to the I-implicatures in (27a) and (27b) as possible perfect states.

(26) Ken has lived in London.

(27)  $\exists e \exists s [\text{Ken\_live\_in\_London}(ev) \wedge X(s) \wedge \tau(e) \prec n \wedge \tau(s) \circ n]$

a. Ken (still) lives in London.

b. Ken knows good restaurants in London.

When the value of *X* in (27) is ‘Ken\_live\_in\_London,’ we are dealing with a continuative reading (see (28)). When the value of *X* is interpreted as ‘Ken\_know\_good\_restaurants\_in\_London,’ we are dealing with a non-continuative, implicated resultative perfect reading (see (29)).

(28)  $X(s) = \text{Ken\_live\_in\_London}(s)$

(29) Non-continuative reading:

$X(s) = \text{Ken\_know\_good\_restaurants\_in\_London}(s)$

Crucially, the constraint that the category of the perfect state be I-implicated (and therefore inferable) properly excludes a temporally coincidental state, such as (15c) above.

Our claim that continuative and non-continuative readings of perfects of stative prior eventualities are pragmatic variants and do not correspond to two distinct meanings or structures contradicts the view of Dowty (1979), Mittwoch (1988), and Portner (2003). These scholars argue that continuative and non-continuative (existential) perfect readings involve two different structures (scopal or otherwise), because different possible positions of *for*-phrases correlate with these distinct readings as shown in (30).

(30) a. For one year, Ken has lived in London.

—(Continuative /??Existential)

b. Ken has lived in London for one year.

—(Continuative /Existential)

However, this distinction is no more than a tendency. Existential perfect readings are sometimes possible when *for*-phrases are preposed. For example, (31) receives an existential perfect reading when people are talking about Ken’s field work experience.

- (31) For one year, Ken has lived in Papua New Guinea. For three months, he has lived in Malaysia.  
— (Existential perfect reading)

We conclude that the distinction between continuative and existential perfect readings does not seem to stem from a structural ambiguity reflected in the possible positions of durational adverbial phrases.<sup>4</sup>

Two final remarks. First, even if the category of the perfect state correspond to a lexical entailment of the verb, as in (22), a pragmatic inference is still required, namely that this state persists until reference time (*the inference of persistence*) (McDermott 1982), since there is no guarantee that the entailed state of Ken's leg being broken continues from the end of the prior eventuality until now. Second, some perfect sentences may sound odd when finding a contextually appropriate value for  $X$  is hard. For example, (10) may sound odd, even though some value of  $X$  can be inferred from the occurrence of the event, as seen in (32a).

- (32) ??Gutenberg has discovered the art of printing. (McCoard 1978:44)  
a.  $X(s) = \text{Printing\_is\_great}(s)$  ('Isn't printing great! (Portner 2003))

We surmise that the oddness of (32) follows from a general constraint on conversations. The only semantic constraint on the value of  $X$  is that it be pragmatically inferable from the occurrence of the prior eventuality. But, not all inferable values of  $X$  are conversationally appropriate. Asserting both the prior eventuality and the (present) perfect state must make conversational sense. And this is what is hard to imagine in the case of sentences such as (32). If the discourse topic is the value of printing, mentioning that Gutenberg discovered it five hundred years ago violates Grice's relevance maxim; if the discourse centers on the history of publishing, the simple past is more appropriate, as it typically is in narratives. But, as we mentioned before, and contra Portner (2003) and others, the oddity of (32) is only indirectly related to the time elapsed between the discovery and reference time. Both (33)(=11) and (34) are fine in the right contexts, even though the prior eventualities happened quite a while ago.

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4. Examples (i) and (ii) have sometimes also been adduced to support a claim of ambiguity between continuative and existential perfect readings. According to this view, existential perfects such as (i) allow both the simultaneity of the events described by the main and embedded clause or the precedence of the event described by the embedded clause. In contrast, continuative perfects such as (ii) are claimed to disallow the simultaneity of the events described by the main and embedded clauses.

- i. Since Christmas, Ken has claimed that his wife was sick.
- ii. Since Christmas, Ken has been claiming that his wife was sick.

Our consultants disagreed. Both continuative perfect uses as well as existential perfect uses allow both simultaneous (overlapping) and shifted readings.

- (33) Plato has discovered the existence of a priori knowledge. (Attested:<http://www.fiu.edu/~hermanso/over9>)
- (34) Beethoven has not done all this for the sake of producing something longer, more noisy, more full of tunes and more complex than any symphony before. He has consciously attempted within the general pattern of the symphony, to express a predetermined range of emotions. He has tried to make the symphony a vehicle for intense personal feeling about something. (Attested:[http://www.st-and.demon.co.uk/JBSoc/journal/apr\\_99/beet.html](http://www.st-and.demon.co.uk/JBSoc/journal/apr_99/beet.html) )

#### 4. Conclusion

Theories of the perfect that treat it as a stativizer very often claim that it is ambiguous and do not satisfactorily elucidate the properties of that state. This paper proposes a unified analysis of all uses of the perfect. It argues that the perfect *does* introduce a perfect state, but one whose category is semantically unspecified and must be determined pragmatically through I-implicatures. More generally, our analysis shows how semantic and pragmatic factors interact to lead to the various perfect uses in a way that parallels both the analysis of English nominal compound semantics (Kay and Zimmer 1978; Partee 1984) and the pragmatic processes underlying reference resolution (Clark 1992).

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