

Danger of Partial Universality: In Two Uses of *In*-adverbials

Jae-Hak Yoon

1 Introduction

Not all empirical facts are treated equally in science; in theorizing, some are weighed more heavily than others. It is often unavoidable and it should not necessarily be avoided. We will present a case where a semantic theory is influenced more by a seemingly universal fact, but in fact accidental among related languages, than by a few significant exceptions in the language in question, thereby failing to capture a meaningful generalization. In particular, we argue that *in*-adverbials are not a test for telic predicates, as they are popularly claimed to be; we will show that this claim is triggered by the accidental fact that there are two homomorphic *in*-adverbials in English and their cognates in other languages.

2 Two Uses of *In*-adverbials

Examples like (1)–(4) below are often presented to argue that an adverbial like *in an hour* can occur with an accomplishment or an achievement, but not with an activity or a stative (cf. Dowty 1979, Hinrichs 1985, Krifka 1986). (3) and (4) are normally unacceptable; thus, if they mean anything at all, they receive coerced interpretations such that (i) Mary will ‘begin’ to run after an hour has passed and (ii) Mary will ‘begin’ to sleep after an hour has passed, respectively. In this case, the activity verb *run* and the stative *sleep* have been coerced to inchoatives, a subclass of achievements. Thus, *in*-adverbials are claimed to serve as a crucial test for telics. This position is also supported by the observation in many European languages that *in*-adverbials and their counterparts are used for telics, but not for atelics (cf. Smith 1991). For these reasons, a unified semantics for *in* has been proposed (cf. Dowty 1979, Hinrichs 1985), even though they acknowledge some differences in meaning.

- (1) Mary wrote the letter in an hour.
- (2) Mary will close the door in an hour.
- (3) ??Mary will run in an hour.
- (4) ??Mary will sleep in an hour.

Comparing the semantic contributions of *in an hour* in (1) and (2) above, we notice that the adverbial behaves in strikingly different manners depending on whether it modifies accomplishments or achievements. Several differences can be listed as in (5):¹

- (5)
 - *In*-adverbials always refer to contiguous times for achievements but they sometimes refer to noncontiguous times for accomplishments.
 - A contextually given reference time is required for achievements but is not for accomplishments.
 - *In*-adverbials are upward monotone with respect to accomplishments but not with respect to achievements.
 - *In*-adverbials refer to runtimes, or event times, for accomplishments but for achievements they refer to elapsed times, times from a reference point until the given event occurs.

For instance, if we compare the sentences in (1) and (6) below, we notice that (a) the one hour in the letter writing does not have to be one continuous hour but the one hour in the leaving has to; (b) in (6) a specific reference point is required to know from what time the elapsing of an hour is being considered, but it is unnecessary for (1); (c) in a situation where Mary actually wrote the letter in 40 minutes, (1) is acceptable, whereas if Mary did leave in 40 minutes, (6) is not readily acceptable.²; (d) the one hour refers to the time spent in writing the letter in (1) but the time before leaving in (6):

- (1) Mary wrote the letter in an hour.

¹*In*-adverbials have two different uses, and these differences are commonly seen between accomplishments and achievements when these adverbials modify them. However, this does not mean that the use of *in*-adverbials is determined by the predicate they modify.

²Dowty (1979:334) suggests that it is bad because of a violation of the Maxim of Quantity. Yet, the point is that the pragmatic principle seems to affect accomplishments and achievements differently in this respect.

(6) Mary left in an hour.

Despite these differences, it is observed in many languages that the same *in*-adverbials, or their counterparts, are used for both types of telics (cf. Smith 1991:157). Then, a natural question is whether *in*-adverbials have the same truth conditions with both accomplishments and achievements. If they do, are the truth conditions given above adequate to accommodate the different behavior of achievements? While the same truth conditions are explicitly proposed by Dowty and Hinrichs, most authors are silent on this matter, with the exception of Nerbonne (1984), who acknowledges one of the above-mentioned differences and proposes two different truth conditions for the German preposition *in* 'in' (see Nerbonne 1984:61–62). However, all three authors assume that *in*-adverbials in English and German are compatible only with telics.³ The difference is that Dowty and Hinrichs propose a unified semantics for English *in*-adverbials, whereas Nerbonne suggests two different truth conditions for them.

3 Meaningful Exceptions

However, an example like (7) is found in the literature but not explained, even though it seems to counterexemplify the observation described above that *in*-adverbials occur only with telics.⁴ Note that the following sentences are potentially ambiguous depending on the relative scope of the progressive marker and the adverbial.⁵

(7) Mary was running in an hour.

Let us take the more natural reading where the adverbial is considered to have wider scope than the progressive (cf. Dowty 1979:346–347). In this case, the clause *Mary was running* is technically stative. Nevertheless, it is not a coerced reading in any way (the unmarked reading is of the stative type). In other words, it doesn't mean that there was a unique interval within a certain hour at which *Mary was running* is true. Nor does it mean

³Nerbonne suggests that *in*-adverbials are systematically ambiguous between measuring and 'inchoative' readings. Thus, he asserts that an *in*-adverbial can appear with any aktionsart to produce an inchoative reading. But, this is the coerced reading Dowty points out (Dowty 1979:335). Thus, Nerbonne's position is still consistent with Dowty and Hinrichs.

⁴Dowty (1979:346–347) in fact discusses an example of this type. However, he does not explain why a noninchoative reading is possible for atelics.

⁵Let us ignore yet another ambiguity in (7), involving the futurate progressive reading.

that she started running in an hour. This sentence is not given a correct translation using the standard semantics of *in*-adverbials, as the reader can easily determine.

More counterexamples to the claim that *in*-adverbials appear only with telics are found in (8) and (9).

(8) Mary was in bed in three hours.

(9) Mary was asleep in three hours.

There seems to be one and only one factor which determines what kind of atelics can be modified by an *in*-adverbial. Namely, the atelic sentences which can be modified by an *in*-adverbial can also appear with adverbials such as *at noon* and *when John arrived*, whereas those which cannot be are not allowed with adverbials of this type. This contrast is illustrated in (10) and (11). Note that these are adverbials which locate eventualities at a point, or within a very short interval. In this sense, they differ from other locating adverbials like *yesterday* and *during the break*, which involve relatively long intervals.

(10) a. Mary was running at noon/when John arrived.

b. Mary was in bed at noon/when John arrived.

c. Mary was asleep at noon/when John arrived.

(11) a. ??Mary ran at noon/when John arrived.

b. ??Mary slept at noon/when John arrived.

Notice that the unnatural sentences in (11) can receive coerced interpretations like (12). This fact further suggests that the adverbials *at noon* and *when John arrived* are parallel to *in*-adverbials.

(12) a. Mary began to run at noon/when John arrived.

b. Mary began to sleep at noon/when John arrived.

Thus, what seems to be at work is that (a) *in*-adverbials in these examples locate events at times and (b) these times are points, or very short intervals, like the time referred to by an adverbial *at noon*. Assuming this, the differences that *in*-adverbials demonstrate between achievements and accomplishments are precisely those which *in*-adverbials display between atelics and accomplishments. For instance, the interval involved in (8) can be described as in (13).

- (8) Mary was in bed in three hours.
- (13) • The three hours has to be contiguous.
 • A reference point to measure the three hours has to be provided in the context. Otherwise, it is infelicitous.
 • (8) does not entail *Mary was in bed in four hours*.
 • The three hour interval is not that during which Mary was in bed. Rather it is understood as the time that passed before she was in that situation.

Consequently, two uses of *in*-adverbials are different **not** between accomplishments and achievements *per se*, **but** between accomplishments and the rest of the aktionsarten, a conclusion suggesting that they are different lexical items. Therefore, the *in*-adverbials in this use can be best treated as locating adverbials to which adverbials like *at noon* belong. When an appropriate context is given, the *in*-adverbial in a sentence like (14) can be ambiguous between measuring and locating.

- (14) John wrote the letter in an hour.
 (a) The duration of John's writing the letter was within one hour.
 (b) In an hour (of some reference time), John wrote the letter.

Accordingly, the truth conditional definition of *in* in this use is proposed in (15). Note that $t \prec_M e$ reflects the fact that a *in*-adverbial locates an event within a time which is (a) later than a contextually salient time, via the free variable t , and (b) later than the salient time by the amount of time, M , specified by the given complement temporal noun.

- (15) The truth conditions for locating *in*:
 $\lambda M \lambda P \lambda e [P(e) \ \& \ t \prec_M e]$,
 where the measured precedence relation \prec_M is defined as:
 $t \prec_M e \equiv \exists t_1 [t \prec t_1 \ \& \ t_1 \prec e \ \& \ M(t) \ \& \ \forall t_2 [[t \prec t_2 \ \& \ t_2 \prec e] \rightarrow t_2 \subseteq t_1]]$

As a result, the sentence (6) below will have the truth conditions in (16).

- (6) Mary left in an hour (i.e., an hour later from some salient time).'
 (16) $\exists e [leave(m, e) \ \& \ past(e) \ \& \ t \prec_{one.hour} e]$

On the other hand, (17) is proposed as the truth conditions for *in* as it appears in a measure adverbial.⁶

- (17) The truth conditions for measuring *in*:
 $\lambda M \lambda P \lambda e_1 [P(e_1) \ \& \ \exists t [M(t) \ \& \ e_1 \leq t \ \& \ (\forall e_2 [[e_2 \leq e_1 \ \& \ P(e_2)] \rightarrow e_2 = e_1]]]]$

While we have observed that *in*-adverbials usually function as measure adverbials only with accomplishments, the truth conditions in (17) do not exclude the possibility of a measuring *in*-adverbial modifying achievement events; the conditions exclude only atelics, since they contain the clause reflecting the uniqueness condition. Nevertheless, the proposed truth conditions seem to be appropriate for two reasons.

First, though achievements are allowed according to the semantics in (17), normally the pragmatic inference disallows them. For instance, the sentence (18) will be infelicitous if the adverbial must be taken to measure the event time. It would be very strange for an event of leaving to last for an hour; thus, this reading is normally dismissed. If it indeed took Mary an hour in leaving, the event is technically considered as an accomplishment.

- (18) Mary left in an hour.(intended) ‘Mary spent an hour leaving.’

Second, in rare cases achievements can be modified by a measuring *in*-adverbial, if the complement of *in* denotes an extremely short interval like ‘one second’. For instance, (19) is acceptable, even though the sentence describes an achievement event. Thus, we need to allow achievements in principle.

- (19) Mary disappeared in one second.

4 Ey-adverbials

The conclusion that *in*-adverbials are different in their uses with accomplishments and the other aktionsarten is reinforced by the existence of *ey*-adverbials in Korean. These adverbials measure the event time of accomplishments but they do not appear with the other aktionsarten. Thus, they precisely correspond to English *in*-adverbials with respect to accomplishments, but correspondence is not shown for achievements, activities, or statives: (20) (23) show these aktionsarten cannot be modified by an

⁶The formula within the parentheses corresponds to the uniqueness presupposition. To be strict, presuppositional content shouldn’t be included as part of truthconditional definition.

ey-adverbial. The sentences in (21)–(23) cannot get coerced inchoative interpretations, either.

- (20) John-i yukkaywol-ey cip-ul ci-ess-ta.
 John-nom 6 month-in house-acc build-past-dec
 ‘John built a house in 6 months.’
- (21) #John-i yukkaywol-ey cenhwaha-ess-ta.
 John-nom 6 month-in call-past-dec
 (intended) ‘John called in 6 months.’
- (22) #John-i sey sikan-ey tali-ess-ta.
 John-nom 3 hour-in run-past-dec
 (intended) ‘John ran/began to run in 3 hours.’
- (23) #John-i sey sikan-ey cali-ey iss-ess-ta.
 John-nom 3 hour-in bed-in exist-past-dec
 (intended) ‘John was in bed in 3 hours.’

Notice that this is consistent with the above conclusion. Namely, accomplishments differ from the other aktionsarten with respect to this temporal adverbial, existence of which is suggested by the different behaviors of *in*-adverbials exhibited between accomplishments and the other aktionsarten. According to our observation, it would be highly unlikely for any language that a certain measure adverbial just like a *in*-adverbial modifies either achievements only or accomplishments and states only.

It may be instructive to try to understand how this difference arises between Korean and English. Two facts seem to be involved. First, accomplishments are different from the other aktionsarten in that they provide a natural end point for a given event which is different from its starting point. Therefore, an accomplishment event has a natural interval to measure. On the other hand, achievements are regarded as having one small interval for their event time, which might be considered as the starting and end point. Activities and states, by definition, do not have identifiable end points. Hence, it follows that it is the most natural and the easiest to measure the event time of an accomplishment event, i.e. it is often unnecessary to measure the event time of an achievement event; it would be not as simple to measure the event time of an activity or a stative. Therefore, it is plausible that there exists some temporal adverbial which measures accomplishments only, e.g. Korean *ey*-adverbials and English *in*-adverbials used for accomplishments.

Second, it appears that certain English temporal adverbials contain default information specifying temporal directions, even though the information is not retrievable from its parts. For instance, the adverbials in (24) all locate events at or within certain intervals. Notice that examining the individual lexical items does not readily lead us to conclude that the combinations should mean (a) two years later than now, (b) a month later than Monday, or (c) three hours later than noon. The individual lexical items do not give a clue to why it is *later*, but not *ago/before*.

- (24) a. two years from now
 b. a month from Monday
 c. three hours from noon

On the other hand, Korean does not have this default information about the temporal direction, at least with the adverbials corresponding to (24); the morpheme *hwu* 'later/after' is required to specify the temporal direction as exemplified in (25). Note that the postposition *ey* 'in' is optional in this case.

- (25) a. cikum-pwuthe inyen hwu(-ey)
 now-from 2 year after-in
 'two years from now'
 b. wolyoil-pwuthe han dal hwu(-ey)
 monday-from one month after-in
 'a month from Monday'
 c. cengo-pwuthe sey sikan hwu(-ey)
 noon-from 3 hour after-in
 'three hours from noon'

Likewise, the morpheme *cen* 'before' is necessary for temporal adverbials locating events within an interval prior to some other interval, though it is also the case in English.

- (26) a. cikum-pwuthe inyen cen(-ey)
 now-from 2 year before-in
 'two years before now/ago'
 b. wolyoil-pwuthe han dal cen(-ey)
 monday-from one month before-in
 'a month before Monday'

- c. cengo-pwuthe sey sikan cen(-ey)
 noon-from 3 hour before-in
 'three hours before noon'

Given this fact, it seems clear that English *in*-adverbials occurring in achievements or statives are roughly equivalent to Korean adverbials with *hwu-ey*, as in (25), which mean 'in *x* time later'.

- (27) a. Mary will write a letter in an hour.
 b. Mary will close the door in an hour.
- (28) a. Mary will write a letter an hour from now.
 b. Mary will close the door an hour from now.

5 Conclusion

In summary, we have come to notice that (a) two uses of *in*-adverbials are significantly different, (b) two uses of *in*-adverbials are different **not** between accomplishments and achievements *per se*, **but** between accomplishments and the rest of the aktionsarten, a conclusion suggesting that they are different lexical items.

Accordingly, the question to ask is not whether unified truth conditions should and can be given to *in*-adverbials in their use with accomplishments and achievements; rather, it is whether unified truth conditions should and can be given to *in*-adverbials in their use with all aktionsarten. While there are two clearly distinctive functions of *in*-adverbials, it is unclear whether they involve homonymy or polysemy. We will leave the problem of deciding between the two unresolved.

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