

The Syntax of Temporal Adverbial Clauses in Korean and Its Implications

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ABSTRACT

Haegeman (2012) argues, following Demirdache and Uribe-Etxebarria (2004), that when temporal adverbial clauses in English are essentially relative clauses that provide several pieces of evidence supporting it. In this paper, I examine the syntax of the Korean counterpart of when temporal clauses and point out that there is significant parallelism between Korean and English. Given the typological difference between the languages in question, this observation is significant and provides a novel piece of evidence in support of Haegeman's and Demirdache and Uribe-Etxebarria's analyses.

Keywords: temporal adverbial clause, adverbial, relative clause, argument-adjunct asymmetry, subadjacency, cartography, comparative syntax

1. Introduction

Examining the properties of the left periphery of clause structure, Haegeman (2012) points out that temporal adverbial clauses in English disallow argument fronting, while they allow fronted adjuncts.¹⁾

- (1) a. * When her regular column she began to write last year, I thought she would be OK.
b. When last year she began to write her regular column, I thought she would be OK. (Haegeman, 2012: 195)

In part because of the availability of fronted adjuncts, Haegeman (2012) rejects the idea that the unavailability of argument fronting in cases like (1a) is due to an

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1) Haegeman (2012) also shows that Romance clitic left-dislocation patterns with fronted adjuncts. Given that Korean does not have a direct counterpart of this phenomenon, I will not go into it here.



impoverished or truncated left periphery.²⁾ Rather, assuming that temporal adverbial clauses involve a full functional structure, Haegeman suggests that the argument-adjunct asymmetry be attributed to locality of movement. In a nutshell, the gist of her proposal is that temporal adverbial clauses involve operator movement and that argument fronting, which she argues involves topicalization, interferes with this movement, while fronted adjuncts, which she argues involves base-generation, do not induce such intervention effects. Regarding the nature of the operator movement in temporal adverbial clauses, Haegeman adopts Demirdache and Uribe-Etxebarria's (2004) (henceforth, D&U) proposal that temporal adverbial clauses are concealed relative clauses. I discuss the details of these analyses in Sections 2 and 3.

Against this background, I examine in this paper the syntactic behavior of temporal adverbial clauses in Korean, properties of which have not received much attention in the literature.³⁾ (2) is an example of a typical temporal adverbial clause in Korean.

- (2) Toto-ka tochaha-ess-ul ttay, Momo-nun ca-ko iss-ess-ta.
 T.-Nom arrive-Past-Prn time M.-Top sleep-Comp be-Past-Dec⁴⁾
 'When Toto arrived, Momo was sleeping.'

Crucially, I show that temporal adverbial clauses in Korean behave in parallel with their English counterparts and that in some respect, they provide more direct evidence in support of Haegeman's and D&U's proposals than do their English counterparts. This is particularly significant considering the typological unrelatedness between English and Korean.

2 Operator Movement in Temporal Adverbial Clauses

As mentioned above, Haegeman (2012) points out that there is an argument-

2) See Haegeman 2012, Ch.4 for relevant discussion and various references for the truncation hypothesis.

3) The syntax of temporal adverbial clauses in Korean—especially, the type of temporal adverbial clause represented by (2)—has received little attention in the literature. Existing discussions that do mention some form of temporal adverbial clauses are mostly concerned with the way such subordinate clauses interact with main clauses semantically and/or pragmatically. (Han 1993; Kim, Kim, & Sim, 2020; Suh, 1982, among others, for some discussion).

4) List of Abbreviations: Acc (Accusative), Comp (Complementizer), Cop (Copula), Dec (Declarative), Det (Determiner), Foc (Focus), Fut (Future), Gen (Genitive), Hon (Honorific), Ind (Indicative), Nml (Nominalizer), Nom (Nominative), Pres (present), Prn (Prenominal Modifier Form), Q (Question), Top (Topic).

adjunct asymmetry in temporal adverbial clauses, which she argues is due to an intervention effect with respect to operator movement. She shows that such an asymmetry is quite robust and is also found in other environments that involve operator movement. For instance, in relative clauses in English, fronted arguments are disallowed, while fronted adjuncts are fine.

- (3) a. * I met the author who, this new column, began to write last year.
 b. I met the author who last year began to write this new column.
 (Haegeman, 2012: 196-197)

A similar asymmetry is also observed in embedded interrogatives.

- (4) a. * Robin knows where, the birdseed, you are going to put.
 b. Lee forgot which dishes, under normal circumstances, you would put on the table.
 (Haegeman, 2012: 196, attributed to Culicover, 1991)

Assuming that temporal adverbial clauses involve operator movement⁵⁾, Haegeman argues more specifically that the *wh*-phrase *when* in temporal clauses undergoes movement to SpecCP. As evidence for such movement, she points out the ambiguity in sentences like (5). In particular, the availability of a low reading, as in (5b), is attributed to the long-distance movement of the operator.

- (5) I saw Mary in New York when [_{TP} she claimed [_{CP} that [_{TP} she would leave]]].
 a. High reading: 'I saw her at the time that she made the claim.'
 [_{CP} when_i [_{TP} she claimed [_{CP} that [_{TP} she would leave]] t_i]]
 b. Low reading: 'I saw her at the time of her presumed departure.'
 [_{CP} when_i [_{TP} she claimed [_{CP} that [_{TP} she would leave t_i]]]]
 (Haegeman, 2012: 202, attributed to Larson, 1987)

Significantly, in temporal clauses involving islands, such an ambiguity disappears, i.e., there is a subjacency effect. Haegeman argues this to provide support for the movement analysis.

5) Haegeman (2012: 199) provides a long list of references, not reproduced here, where it is argued that temporal clauses are derived by operator movement. I refer the reader to her work for the relevant references.

(6) I saw Mary in New York when [_{TP} she made [_{DP} the claim [_{CP} that [_{TP} she would leave]]]].

a. High reading: ‘I saw her at the time that she made that claim.’

b. * Low reading: ‘I saw her at the time of her presumed departure.’

(Haegeman, 2012: 202)

(7) I saw Mary in New York when she was wondering whether she ought to leave.

a. High reading: ‘I saw her at the time that she was wondering.’

b. * Low reading: ‘I saw her at the time of her presumed departure.’

(Haegeman, 2012: 202)

3. Temporal Adverbials as Relative Clauses: Demirdache and Uribe-Etxebarria 2004

Concerning the derivation of *when* temporal adverbial clauses, Haegeman follows D&U, who argue that all temporal adverbials—clausal and nonclausal—are PPs that are headed by a spatiotemporal P.⁶⁾ The spatiotemporal P, which can be overt or null, has the function of relating the time of the event of the main clause with that of the temporal adverbial. The examples in (8) involve temporal adverbials with an overt P.

(8) a. Maddi was born in 2000.

b. Maddi was born after/before Christmas.

D&U argue that in cases where a temporal adverbial is without an overt preposition, as in (9), we are dealing with a “concealed PP”.

6) The term “spatiotemporal P” is adopted from the authors’ work under discussion. Though they do not explicitly comment on this, I believe this term indicates that temporal prepositions in English can also be used in locative expressions. The situation is actually not different in Korean. That is, the temporal P *-ey*, to be introduced in Section 4, can in principle be used in locative expressions, as shown below.

(i) Toto-nun mikwuk-ey sa-n-ta.

T.-Top America-in live-Pres-Dec

‘Toto lives in America.’

The discussion below is not concerned with the locative use of such spatiotemporal Ps.

- (9) a. Abdel left [_{NP} June 10, 2001].
- b. La mort nous prend [_{CP} que [_{IP} nous sommes encore (French)
 death us takes that we are still
 pleins de nos misères et de nos bonnes intentions]].
 full of our miseries and of our good intentions
 ‘Death takes us while we are still full of our miseries and good
 intentions.’ (Grévisse, 1980)
- c. [_{CP} [_{IP} Liburu-a irakur-tze-n ari nintze] [_C la]] (Basque)
 book-Det read-Nom-in engaged was that
 heldu ziren.
 arrived were
 Lit.: ‘That I was in the reading of this book, they arrived.’
 ‘They arrived while I was reading this book.’ (D&U: 163)

What is important for us is that even when a temporal adverbial appears to be just a CP, as in (9b, c), it is actually contained in a null PP. Thus, temporal *when* clauses are also concealed PPs, according to D&U.

Note that even if temporal adverbial CPs are concealed PPs, this does not mean that the spatiotemporal P directly takes these CPs as its complement. That is, following Stowell (1981) and Alrenga (2005), Haegeman (2012: 204) assumes that prepositions do not directly combine with CPs.⁷⁾

- (10) a. This assumption accounts for the fact that these nouns behave differently.
 b. *This assumption accounts for that these nouns behave differently.
 (Alrenga, 2005: 185; Takahashi, 2009: 5)

7) An anonymous reviewer for *Language Research* points out that there are situations where a preposition combines with a CP. In fact, Stowell (1981) and Alrenga (2005) also note such cases. More specifically, they show that interrogative CPs can combine with prepositions unlike declarative CPs like those in (10) and (11).

- (i) a. We were talking about who we should help. (Stowell, 1981: 392)
 b. the discovery of how human beings evolved (Alrenga, 2005: 177)

Stowell’s account of this contrast is couched in the framework of Government and Binding, which cannot be directly adopted here. (Alrenga does not go into details of this in his work.) But, the gist of Stowell’s proposal is that interrogative CPs can behave like DPs in relevant respects, allowing them to be used with prepositions. Given this, it is also worth mentioning that Stepanov (2001) argues, following Torrego and Uriagereka (1993), that those CPs that behave like DPs are in fact associated with null DPs. As the distribution of CPs is not the main concern of this paper, I put aside further explorations of these issues for future research.

- (11) a. * George left after that Mary did. (Johnson, 1988: 587)
 b. * They told me about that the police had arrived too late.
 (Haegeman, 2012: 204)

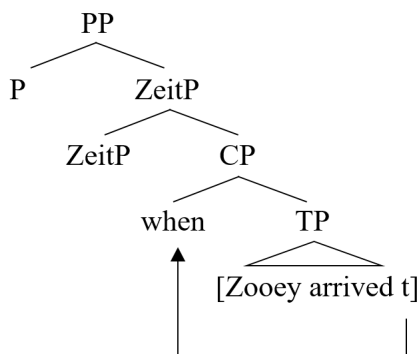
Given this, Haegeman adopts D&U's proposal that the complement of a spatiotemporal P is a temporal DP (or "Zeit Phrase" in terms of Zagana 1990 and Stowell 1993, 2007), which can also be overt or null. (12) illustrates the simplest case where the temporal adjunct is a PP, headed by the overt spatiotemporal P *before*, which in turn takes the overt temporal DP *noon* as its complement.

- (12) Franny left [before noon].

More importantly, like other DPs, ZeitP can be modified by a restrictive relative clause, which is in fact the configuration in *when* temporal adverbial clauses. That is, the *when* clause itself is the relative clause that is adjoined to a null ZeitP. Within the relative clause, *when* is the element that undergoes operator movement. Given this, the relevant portion of the structure of the temporal adverbial clause in (13a) can be represented as in (13b).

- (13) a. Fanny was leaving when Zooey arrived.

b.



(D&U: 169-170)

Note that in (13b), the spatiotemporal P and ZeitP are both null. D&U (p.177) note that the structure in (13b) can be more transparently reflected in a temporal clause like (14).

- (14) [_{PP} at [_{DP} the time [_{CP} when [_{TP} Zooey arrived t]]]] (D&U: 177)

4. Temporal Adverbial Clauses in Korean

I have summarized Haegeman's and D&U's analyses of temporal adverbial clauses in the preceding sections. Let us turn to temporal adverbial clauses in Korean. (15b) involves a direct Korean counterpart of the temporal clause in (15a).

- (15) a. When Toto received the prize, he was 20 years old.
b. [Toto-ka ku sang-lul pat-un/pat-ass-ul ttay]
.T.-Nom the prize-Acc receive-Prn/receive-Past-Prn times
ku-Nun sumwu sal-i-ess-ta.
he-Top 20 years.old-Cop-Past-Dec
'When Toto received the prize, he was 20 years old.'

Note that there is no overt counterpart of *when* in the temporal clause in (15b). At first blush, this seems unexpected because Korean does have a counterpart of *when* in interrogative sentences.

- (16) a. When did Toto arrive?
b. Toto-ka encey tochakha-ess-ni?
T.-Nom when arrive-Past-Q
'When did Toto arrive?'

However, it should be noted that Korean does not have overt relativizers in relative clauses, as shown below.

- (17) a. Toto-ka mek-un sakwa
T.-Nom eat-Prn apple
'the apple that Toto ate'
b. Toto-ka sa-l cip
T.-Nom buy-Prn house
'the house that Toto will buy'

Therefore, given the relative clause analysis of *when* temporal clauses above, the lack of an overt counterpart of *when* in temporal clauses in Korean is in fact expected.

It should also be noted that the verb of the temporal adverbial clause in (15b) has the prenominal modifier ending *-(u)n/-(u)l*, which obligatorily attaches to subordinate clauses in prenominal position, as in relative clauses (see (17)).⁸ This is also consistent with the relative clause analysis by Haegeman and D&U.

Recall that according to Haegeman's and D&U's analyses, *when* temporal clauses are concealed PPs, headed by a spatiotemporal preposition taking a temporal nominal complement ZeitP. But, except in cases like (14), whether ordinary *when* temporal clauses in English indeed involve such a structure is not so obvious on the surface, because the spatiotemporal P and ZeitP are both null. The Korean counterparts of *when* temporal clauses come in handy in this regard. That is, note the obligatory occurrence of the temporal noun *ttay* 'moment, time' in (15b), which I assume instantiates ZeitP corresponding to *the time* in (14) as well as its silent counterpart in (13b).⁹ Furthermore, temporal adverbial clauses in Korean can be overtly accompanied by the spatiotemporal P *-ey*, as shown below.

- (18) Cong soli-ka tulli-ess-ul ttay-(ey) maul-ey salamtul-i
 bell sound-Nom hears-Past-Prn time-at town-in people-Nom
 amwuto ep-ess-ta.
 anyone not.be-Past-Dec
 'When the bell sound was heard, there was no one in town.'

Thus, the above comparison between *when* temporal clauses and their Korean counterparts already provides initial support for Haegeman's and D&U's analyses. Below, I discuss further similarities between *when* temporal clauses and their Korean counterparts that provide additional support for their analyses.

8) The nature of *-(u)n* and *-(u)l* is controversial. It has been argued that their distribution is determined by a complex interaction among factors like tense, aspect, mood, and the lexical properties of predicates (see An, 2014; Lee, 1995, 2015; Mwun, 2009; Sohn, 1999; Suh, 1994; Yang, 1978; Yang, 2008; Yoo, 2009, for relevant discussion and references). As intriguing as they are, discussing the behavior of *-un* and *-ul* goes beyond the scope of this paper. Therefore, in what follows, I will abstract away from the issues involving the prenominal modifier endings and use whichever form makes the examples natural and plausible.

9) It may be that *ttay* corresponds to time alone, as Korean does not have articles. It is also worth noting that while *ttay* is the most common element as the head noun in a temporal clause in Korean, other temporal expressions with richer lexical content such as *swunkan* 'moment', *nal* 'day', and so on, can also be used. Of course, English also allows similar possibilities and in such cases, a temporal clause clearly has the form of a relative clause.

(i) a. The moment when he said it ...
 b. The day when he was born ...

4.1. Argument-adjunct asymmetry

Recall that according to Haegeman, temporal adverbial clauses disallow argument fronting, while they allow fronted adjuncts. The same kind of asymmetry is observed in temporal adverbial clauses in Korean as well.

- (19) a. Toto-ka ca-l ttay pi-ka manhi wa-ss-ta.
T.-Nom sleep-Prn time rain-Nom much come-Past-Dec
'When Toto was asleep, it rained much.'
- b. *Toto-nun ca-l ttay pi-ka manhi wa-ss-ta.
T.-Top sleep-Prn time rain-Nom much come-Past-Dec
- (20) a. Pang-eyse Toto-ka ca-l ttay pi-ka manhi wa-ss-ta.
room-in T.-Nom sleep-Prn time rain-Nom much come-Past-Dec
'When Toto was sleeping in the room, it rained much.'
- b. Ecey Toto-ka ca-l ttay pi-ka manhi wa-ss-ta.
yesterday T.-Nom sleep-Prn time rain-Nom much come-Past-Dec
'When Toto was sleeping yesterday, it rained much.'

As mentioned above, Haegeman argues that fronted arguments involve topicalization, while fronted adjuncts are base-generated and that the former interferes with operator movement, while the latter doesn't. Given this, it is also noteworthy that even adjuncts are disallowed in temporal clauses in Korean when they are topicalized, as shown below.¹⁰⁾

- (21) a. *Pang-eyse-nun Toto-ka ca-l ttay pi-ka manhi
room-in-Top T.-Nom sleep-Prn time rain-Nom much
wa-ss-ta.
come-past-dec
- b. *Ecey-nun Toto-ka ca-l ttay pi-ka manhi
yesterday-Top T.-Nom sleep-Prn time rain-Nom much
wa-ss-ta.
come-Past-Dec

10) See Han (2002), Kim (1991), Lee (2008), and Sohn (2009)'s research for aspects of topicalization in Korean. See also Maki, Kaiser, and Ochi (1999) and references therein for relevant discussion on topicalization in English and Japanese.

4.2. High-low readings and subjacency effects

Haegeman and D&U discuss the availability of high-low readings as evidence for operator movement in temporal adverbial clauses. The same kind of ambiguity is attested in temporal adverbial clauses in Korean, as shown below.

- (22) a. [Ku-ka [caki-ka kwunin-i-ess-ta-ko] ha-n ttay]-(ey)
 he-Nom self-Nom soldier-Cop-Past-Dec-Comp say-Prn time-at
 na-nun kotunghaksayng-i-ess-ta.
 I-Top high.school.student-Cop-Past-Dec
- b. High reading: ‘At the time that he made the remark (that he was a soldier), I was a high school student.’¹¹⁾
- c. Low reading: ‘At the time that (according to him) he was a soldier, I was a high school student.’
- (23) a. [Yeyenca-ka [seysang-uy congmal-i o-l ke-la-ko] ha-n
 prophet-Nom world-Gen end-Nom come-Fut-Dec-Comp say-Prn
 ttay]-(ey) (silceylonun) amwu il-to ilena-ci anh-ass-ta.
 time-at in.reality any thing-Foc happen-Nml not-Past-Dec
- b. High reading: ‘At the time that the prophet made a prophesy (to the effect that the end of the world was coming), nothing happened.’ [Suppose that there was a prohibition against making apocalyptic prophesies.]
- c. Low reading: ‘At the time that the end of the world was supposed to come (as prophesized by the prophet), nothing actually happened.’ [The prophesy was wrong.]

In addition to the availability of high-low readings, another important piece of evidence for operator movement in temporal adverbial clauses in Korean is the availability of subjacency effects. Thus, when the temporal adverbial clauses in (22) and (23) involve an island, the low readings become unavailable.

11) Throughout the paper, I will often adopt liberal translation of Korean sentences to better represent the intended readings.

- (24) a. [Ku-ka [[caki-ka kwunin-i-ess-ta-nu-n] cwucang]-ul
 he-Nom self-Nom soldier-Cop-Past-Dec-Ind-Prn claim-Acc
 hay-ss-ul ttay]-(ey) na-nun kotunghaksayng-i-ess-ta.
 do-Past-Prn time-at I-Top high.school.student-Cop-Past-Dec
- b. High reading: 'At the time that he made the claim (that he was a soldier), I was a high school student.'
- c. *Low reading: 'At the time that (according to his claims) he was a soldier, I was a high school student.'
- (25) a. [Yeyenca-ka [[seysang-uy congmal-i o-l ke-la-nun] yeyen]-ul
 prophet-Nom world-Gen end-Nom come-Fut-Dec-Prn prophesy-Acc
 ha-n ttay]-(ey) amwu ilto ilena-ci anh-ass-ta.
 do-Prn time-at any thing happen-Nml not-Past-Dec
- b. High reading: 'At the time that the prophet made a prophesy (to the effect that the end of the world was coming), nothing happened.' [Suppose that there was a prohibition against making apocalyptic prophesies.]
- c. *Low reading: 'At the time that the end of the world was supposed to come (as prophesized by the prophet), nothing happened.' [The prophesy was wrong.]

To summarize, I have shown in this section that temporal adverbial clauses in Korean show parallel behavior to their English counterparts. The parallelism is particularly significant given the typological unrelatedness of the languages in question. The discussion in this section thus provides strong support for Haegeman's and D&U's analyses.

5. Other Temporal Adverbial Clauses in Korean

Before wrapping up the discussion, let us briefly examine some other temporal clauses in Korean that show some similarities and differences with respect to the *ttay* temporal clause.

The first set of examples involves temporal adverbial clauses headed by *until* and *since*. In Korean, the elements that correspond to *until* and *since* are *-kkaci* and *-pwuthe*, respectively.

- (26) a. Toto-nun peyl soli-ka tulli-l ttay-kkaci kitale-ess-ta.
 T.-Top bell sound-Nom hear-Prn time-until wait-Past-Dec
 'Toto waited until the bell sound was heard.'
- b. Toto-nun peyl soli-ka tulli-n ttay-pwuthe kitale-ess-ta.
 T.-Top bell sound-Nom hear-Prn time-from wait-Past-Dec
 'Toto waited since the bell sound was heard.'

Note that the temporal clauses in (26) contain a *ttay* temporal clause as part of their structure. It was shown in (18), repeated below as (27a), that the *ttay* temporal clause allows the spatiotemporal P *-ey* 'at' to be overtly realized. However, in the presence of *-kkaci* 'until' and *-pwuthe* 'since', *-ey* cannot occur, as shown in (27b). Given this, I assume that *-kkaci* and *-pwuthe* are also spatiotemporal Ps like *-ey* occupying the same position as the latter.¹²⁾ This means that *-kkaci* and *-pwuthe* temporal clauses are just regular *ttay* temporal clauses with the relevant spatiotemporal Ps and thus can be analyzed in the same way as regular *ttay* temporal clauses.

- (27) a. Cong soli-ka tulli-ess-ul ttay-(ey) maule-ey salamtul-i
 bell sound-Nom heard-Past-Prn time-at town-in people-Nom
 amwuto ep-ess-ta.
 anyone not.be-Past-Dec
 'When the bell sound was heard, there was no one in town.'
- b. Cong soli-ka tulli-ess-ul ttay-(*ey)-kkaci/-pwuthe maule-ey
 bell sound-Nom heard-Past-Prn time-at-until/-from town-in
 salamtul-i amwuto ep-ess-ta.
 people-Nom anyone not.be-Past-Dec
 'Until/since the moment that the bell sound was heard, there was no one in town.'

As expected, *-kkaci* and *-pwuthe* temporal clauses also allow the high-low reading ambiguity, confirming that the analysis proposed above can be extended to them.

12) As expected, *-kkaci* and *-pwuthe* can also be used in locative expressions. (Cf. note 6)

- (i) Seoul-kkaci/-pwuthe-uy keli-nun payk-khillomithe-ta.
 Seoul-to/-from-Gen distance-Top 100-kilometer-Dec
 'The distance to/from Seoul is 100 kilometers.'

- (28) a. [Toto-ka [Momo-ka o-l ke-la-ko] ha-n ttay-kkaci]
 Toto-Nom Momo-Nom come-Fut-Dec-Comp say-Prn time-until
 amwuto o-ci anh-ass-ta.
 no.one come-Nml not-Past-Dec
- b. High reading: ‘Until the moment that Toto made the remark (that Momo would come), nobody had come.’
- c. Low reading: ‘Nobody came until the time that (according to Toto) Momo was supposed to come.’
- (29) a. [Ilkiyeypo-eyse [pi-ka kuchi-l ke-la-ko] ha-n
 weather.forecast-from rain-Nom stop-Fut-Dec-Comp say-Prn
 ttay-pwuthe] pi-ka te o-ki sicakha-ess-ta.
 time-since rain-Nom more fall-Nml begin-Past-Dec
- b. High reading: ‘It began to rain more from the moment the forecast was made (to the effect that it would stop raining at some point).’
- c. Low reading: ‘It began to rain more from the moment that it was supposed to stop raining (according to the forecast).’

Finally, let us briefly consider a different kind of temporal clause in (30), which involves an *after*-clause.

- (30) Momo-nun Toto-ka o-n twi-(ey) cip-ey ka-ss-ta.
 M.-Top T.-Nom come-Prn after-at home-to go-Past-Dec
 ‘Momo went home after Toto came.’

Unlike the *-kkaci/-pwuthe* temporal clauses in (26), (30) does not involve a *ttay* clause. It is also noteworthy that the nominal element *twi* itself expresses the meaning ‘after’. That is, *twi* is like a spatiotemporal P in that it encodes a temporal ordering relation, while it is classified as a noun in Korean grammar. Interestingly, the *twi* temporal clause does not seem to allow a high-low reading ambiguity.

- (31) a. [Ilkiyeypo-eyse [pi-ka kuchi-l ke-lako] ha-n twi-(ey)]
 weather.forecast-from rain-Nom stop-Fut-Comp say-Prn after-at
 pi-ka te o-ki sicakha-ess-ta.
 rain-Nom more fall-Nml begin-Past-Dec

- b. High reading: ‘After the moment when the forecast was made (to the effect that it would stop raining at some point), it began to rain more.’
- c. *Low reading: ‘After the moment when the rain was supposed to stop (according to the forecast), it began to rain more.’

At this point, the reason for the different behavior of the *twi* temporal clause is not clear. It may be that the *twi* temporal clause does not involve a relative clause structure—perhaps, it takes a complement clause without operator movement. I assume tentatively that the spatiotemporal noun *twi* orders the temporal argument of its complement with respect to that of the main clause, which is why the subordinate clause within the complement is not accessible to it, disallowing a low reading. Further details of the *twi* temporal clause have to await further investigation.

6. Conclusion

Haegeman and D&U argue that in *when* temporal adverbial clauses in English, the subordinate clause introduced by *when* is actually not the temporal adverbial itself, but is the relative clause that modifies a null temporal DP (ZeitP). According to them, the temporal adverbial is actually a PP headed by a null spatiotemporal P combined with the temporal DP that the *when* clause modifies. In this paper, I discussed the behavior of the Korean counterpart of *when* temporal adverbial clauses and argued that it provides direct evidence in support of Haegeman’s and D&U’s analyses. I have pointed out that in Korean temporal clauses, the spatiotemporal P and the temporal DP are all overtly realized and that the subordinate clauses in such temporal clauses show characteristic properties of relative clauses. I have also shown that the same type of argument-adjunct asymmetry and subadjacency effects are manifested in temporal adverbial clauses in Korean. Given the typological difference between English and Korean, this parallelism is significant and provides a novel piece of evidence in support of Haegeman’s and D&U’s analyses. Note that in Haegeman’s analysis, phenomena like argument fronting, intervention effect, and so on, play an important role. The parallelism between English and Korean temporal clauses reported in this paper may be indicating that Haegeman’s analysis of these phenomena can be extended

to Korean as well, though further explorations of this possibility have to be put aside for future research.

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