

Complex Noun, Multiple Inheritance, and Internally Headed
Relativization in Korean

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Complex noun, multiple inheritance, and internally headed relativization in Korean*

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1. Introduction

One of the major tasks in linguistics is to account for some peripheral or idiosyncratic phenomena through general principles which are relatively well-accepted cross-linguistically. The goal of this paper is to explore an account of the mixed-categorial and mixed-functional properties of the Korean Internally Headed Relative Clause (IHRC) construction from this perspective. Theoretically, our analysis is based on the notions of argument composition (Hinrich and Nakazawa 1994) and construction type inheritance (Sag 1997 and Malouf (To appear), among others). The organization of this paper is as follows. Section 2 discusses the syntactic and semantic properties of the IHRC.¹ Section 3 proposes how the properties are accounted for by the notions of multiple inheritance and argument composition. Section 4 is the conclusion.

2. Properties of the IHRC construction

2.1. Middle-distance dependency

Consider the typical example of the IHRC in (1):

- (1) Na-nun [[totwuk_i-i unhayng-eyse nao-nun] kes_i-ul] capassta.
I-Top thief-Nom bank-from come-out-Adn KES-Acc caught
'I arrested the thief who was coming out of the bank.'

In (1), the locality principle seems to be violated in the sense that the object, *totwuk-i* 'thief', subcategorized for by the matrix verb, *capassta* 'caught', appears within the embedded constituent. To account for this fact, arbitrary coindexation between an element within a relative clause and the head of the IHRC *kes* is generally assumed (e.g., Jhang 1991, Kuroda 1992, and Hoshi 1994, Chung 1996, among others).²

As shown in (2), however, the IHRC construction in Korean cannot be considered as an instance of the genuine unbounded dependency:

- (2) a. Na-nun [kutul-i [___i unhayng-eyse nawassta-ko] malha-n]
I-Top they-Nom bank-from came-out-Comp say-Adn
totwuk_i-ul capassta.
thief-Acc caught
'I arrested the thief who they said was coming out of the bank.'
- b. *Na-nun [kutul-i [totwuk-i unhayng-eyse nawassta-ko]
I-Top they-Nom thief-Nom bank-from came-out-Comp
malha-n] kes_i-ul capassta.
say-Adn KES-Acc caught

In (2a), which is an instance of the externally headed relative clause construction, the head of the EHRC phrase, *totwuk*, is construed with the gap within the embedded clause like the English relative clause. However, in (2b), the head of the IHRC phrase, *kes*, cannot be construed with the embedded subject, *totwuk*, showing that the Korean IHRC is not an instance of the genuine unbounded dependency construction.

2.2. Mixed-categorial properties of the IHRC phrase

The IHRC phrase externally has the nominal property in that it bears accusative, nominative, or genitive case as shown in (1) and (3), while the typical clause cannot bear such case.

- (3) a. [Mwul-i nemchin kes-i] alay chung-ulo hulessta.
 water-Nom overflow-Adn KES-Nom lower floor-to flowed
 Lit. 'The overflowed water flowed to the lower floor.'
- b. [totwuk-i unhayng-eyse nao-nun kes-uy] chepho
 thief-Nom bank-from come-out-Adn KES-Gen arrest
 'the arrest of the thief who was coming out of the bank.'

However, the IHRC phrase also has a verbal property in that it allows subject-to-object raising:

- (4) Na-nun totwuk-ul unhayng-eyse nao-nun kes-ul capassta.
 I-Top thief-Acc bank-out-of come-out-Adn KES-Acc caught
 'I arrested the thief who was coming out of the bank.'

In (4), the embedded nominative subject *totwuk-i* in (1) is realized as an accusative NP *totwuk-ul*, which suggests that the embedded subject can be "raised" to the object of the matrix verb *capassta*. Thus if we simply assume that the IHRC phrase is an NP reanalyzed from an S (e.g., Jhang 1991, Kuroda 1992, and Hoshi 1994, among others), we encounter some difficulties in the account of the raising fact. That is, such raising is generally not allowed across two bounding nodes such as an S and an NP.

We may consider that (4) is not the raising construction derived from (1) but a totally different construction where the constituent [*unhayng-eyse nao-nun kes-ul*] is a kind of appositive parenthetical expression. The typical example of the parenthetical is in (5), where the head of the parenthetical is non-expletive *nom-ul* 'guy':

- (5) Na-nun totwuk-ul, ku khi-ka ku-n nom-ul, capassta.
 I-Top thief-Acc the height-Nom tall-Mod guy-Acc caught
 'I arrested the thief, the guy who was tall.'

It seems, however, that (4) cannot be considered as the parenthetical construction. If (4) and (5) are the same parenthetical construction, the head noun of the parenthetical *nom-ul* in (5) may be substituted by *kes*, as in (4). However, this prediction is not born out, as shown in (6):

- (6) ??Na-nun totwuk-ul khi-ka khu-n kes-ul capassta.
 I-Top thief-Acc height-Nom tall-Mod KES-Acc caught
 'I arrested the thief, the one who was tall.'

In the analysis where (6) is considered as an instance of the IHRC, however, the sentence is naturally ruled out simply because its non-raised version is also ill-formed:

- (7) ??Na-nun [totwuk-i khi-ka khu-n kes-ul] capassta.
 I-Top thief-Nom height-Nom tall-Mod KES-Acc caught
 'I arrested the thief who was tall.'

According to Ohara (1996), the Japanese IHRC has the function of event reporting, and thus it tends to allow only the stage-level verb to be the head which denotes a temporarily bounded situation. We may assume that the constraint is also imposed on the Korean IHRC to account for the awkwardness of (7) where the head verb of the IHRC is a verb of an individual-level which denotes a temporarily unbounded situation.

The case marking and raising facts suggest that the IHRC phrase has mixed categorial properties of a nominal and a verbal.

2.3. Mixed-functional properties of the adnominal verb

The adnominal verb in the IHRC phrase semantically plays the role of an adjunct, which is apparently indicated by the morphological ending of the verb, -(*n*)un, and by the meaning of the whole sentence. However, there exist some syntactic parallelisms between the constituency of the "adnominal-verb+kes" in the IHRC phrase and that of the verbal complex. (The verbal complex is usually analyzed as a combination of "verb+auxiliary verb", e.g., Cho 1988, Sells 1995, and Chung 1998, among others.) The parallelisms suggest that the adnominal verb also needs to be considered as a kind of verbal complement.

In the traditional Korean grammar, *kes* in the IHRC is called a "dependent noun" in that it always requires a verb of an adnominal form and cannot exist alone as a word:

- (8) (Na-nun totwuk-i unhayng-eyse) *(nao-nun) kes-ul capassta.
 I-Top thief-Nom bank-from come-out-Adn KES-Acc caught

Example (8) shows that the adnominal verb of the IHRC phrase, *nao-nun* 'come-out', is neither optional nor can be realized as an empty category. It shows a sharp contrast with the typical EHRC construction in (9), where the entire relative clause, including the adnominal verb, is optional.

- (9) (Na-nun unhayng-eyse nao-nun) totwuk-ul capassta.
 I-Top bank-from come-out-Adn thief-Acc caught
 'I arrested the thief who was coming out of the bank.'

In the Korean verbal complex construction, the same observation can be made:

- (10) (Na-nun sakwa-lul) *(mek-e) poassta.
 I-Top apple-Acc eat try as a test (AUX)
 'I tried an apple.'

Here the auxiliary verb *poassta* itself cannot exist as an independent word but must be accompanied by its governed verb. However, in other constructions, such as control verb constructions, the matrix verb can exist as an independent word, without the governed verb:

- (11) (Na-nun John-hanthey sakwa-lul mek-ulako) seltukhayssta.
 I-Top J-Dat apple-Acc eat persuaded
 'I persuaded John to eat an apple.'

Another example showing the parallelism between the IHRC and verbal complex constructions arises from the afterthought expression construction:

- (12) a. *Na-nun kes-ul capassta, totwuk-i unhayng-eyse nao-nun.
 I-Top KES-Acc arrested thief-Nom bank-from come-out-Adn
 'I arrested the thief who was coming out of the bank.'
 b. Na-nun totwuk-ul capassta, unhayng-eyse nao-nun.
 I-Top thief-Acc arrested bank-from come-out-Adn

Sentence (12a) is an instance of the IHRC construction, where the IHRC is used as an afterthought expression. It shows that the IHRC cannot be used as an afterthought expression differently from the externally headed relative clause in (12b). It suggests that *kes* and the adnominal verb constitute a syntactic unit and that they cannot be separated. The same pattern is also observed in the verbal complex construction:

- (13) a. *Na-nun poassta, sakwa-lul mek-e.
 I-Top tried apple-Acc eat
 'I tried an apple.'
 b. Na-nun seltukhayssta, John-hanthey sakwa-lul mekulako.
 I-Top persuaded J-Dat apple-Acc eat
 'I persuaded John to eat an apple.'

(13a) is an instance of the verbal complex where the auxiliary verb and its governed verb cannot be separated, while (13b) is an instance of the control verb construction where the matrix verb and its complement are separable.

Besides the arguments based on the lexical integrity, another parallelism between the IHRC and verbal complex constructions arises from the fact that the heads of the constructions, namely, *kes* in the IHRC and the auxiliary verb in the verbal complex, are a kind of clitics diachronically derived from independent words whose phonetic forms are the same. For example, the auxiliary verb *pota* 'try as a test' in (10) and (13) has a non-auxiliary-verb counterpart *pota* 'see', which can be used as an independent word. The same observation can be made in the IHRC. The head *kes* in the IHRC can never be used as a referring expression and never takes a specifier such as *ku* 'the' and *ce* 'that':

- (14) *Na-nun totwuk-i unhayng-eyse nao-nun ku kes-ul capassta.
 I-Top thief-Nom bank-from come-out-Adn the KES-Acc caught
 'I arrested the thief who was coming out of the bank.'

However, there exists a referential noun counterpart *kes* 'thing', which can be used as a referring expression and can take a specifier:

- (15) Na-nun ku kes-ul sassta.
 I-Top the thing-Acc bought
 'I bought the thing (it).'

To sum up, there are some parallelisms between the verbal complex and the combination of "adnominal verb+*kes*" in the IHRC phrase. It suggests that the combination in the IHRC needs to be treated as a syntactic unit, namely, as a complex noun. It also suggests that the adnominal verb needs to be considered to have a dual function of a verbal complement and an adjunct.

2.4. Entity vs. event readings

Sentence (1) has only an entity reading, i.e., the object of the matrix verb of (1) is not the whole event but the thief. In contrast, sentence (16) has only an event reading, i.e., the object of the matrix verb is not the thief but the whole event.

- (16) Na-nun [totwuk-i unhayng-eyse nao-nun kes-ul] mallassta.
 I-Top thief-Nom bank-from come-out-Adn KES-Acc not-knew
 'I did not know that the thief was coming out of the bank.'

But not 'I did not know the thief who was coming out of the bank.'

The difference comes from the matrix verb. When the verb is a perception verb, only the event reading is available. When it is a physical action verb, however, only the entity reading is available. Then the question is how the difference can be predicted from the syntactic perspective. In other words, if the internal structure of the embedded constituent in (1) and (16) is assumed to be the same, and if the coindexation between *totwuk* and the embedded constituent is possible in both sentences, it may be hard to explain why only the physical action verb can have the entity reading.

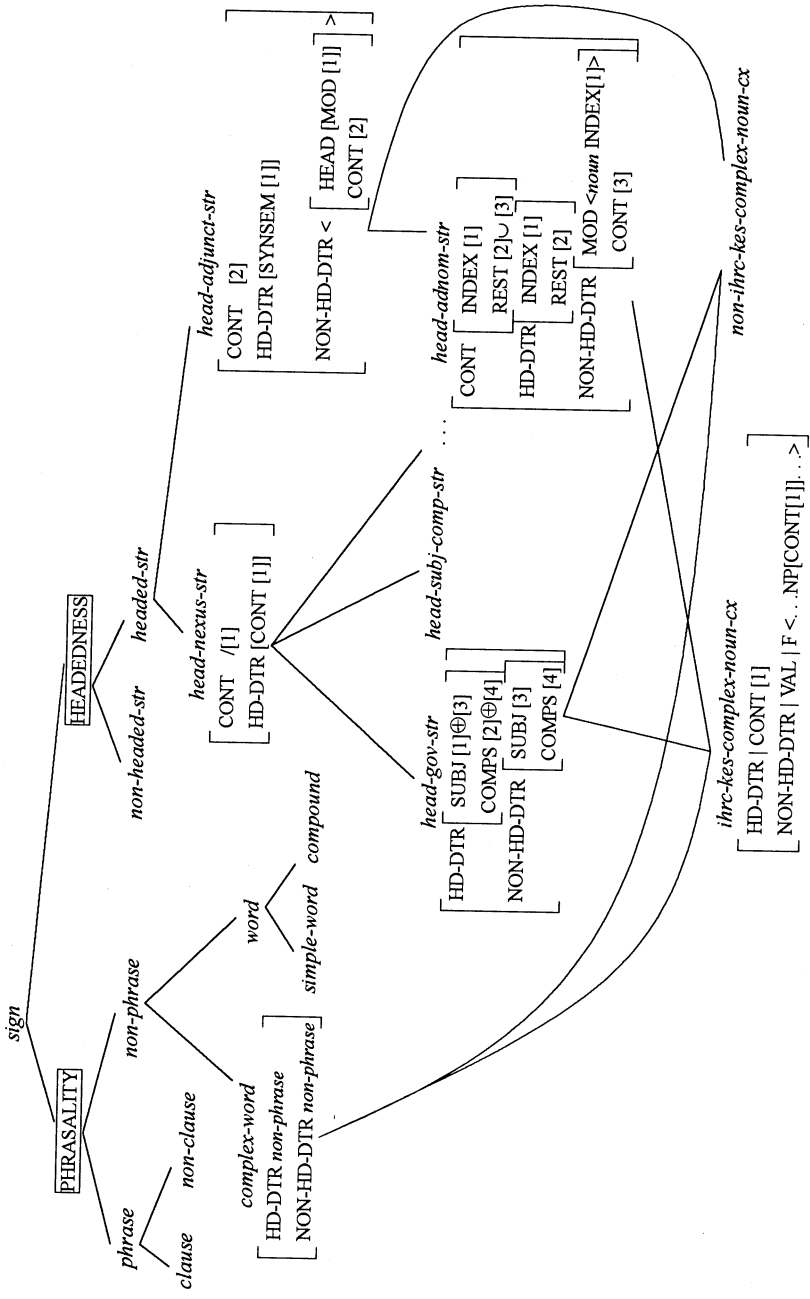
3. A new analysis

The goal of this section is to propose a new analysis of the IHRC through the notions of multiple inheritance of construction types and argument composition.

3.1. Multiple inheritance of construction types

The notion of the multiple inheritance is used in Construction Grammar to capture the fact that instances of some construction types seem to resist being uniquely categorized in a natural way (Goldberg 1995). Sag (1997) and Malouf (1998, To appear), among others, introduced the notion into the framework of the Head-driven Phrase Structure Grammar (HPSG, Pollard and Sag 1994).

(17) Multiple Inheritance Hierarchy



To account for the IHRC construction, I propose the type hierarchy in (17), adopting Sag (1997). Here the sort *sign* is divided into PHRASALITY and HEADEDNESS. Here the notion of PHRASALITY is introduced so as to introduce the sort *complex word* into the hierarchy. *Non-phrase* stands for a sign which does not have phrasal daughters. *Complex-word* stands for a non-phrase which has a non-phrasal daughters, i.e., *word* or *complex-word*.

Head-gov(erne)-str is a sign which has a constraint that the non-head (governee) daughter's SUBJ and COMPS lists are appended to those of the head daughter.³ *Head-adnom-str* is a sign which has the semantics of the traditional relative clause construction.

In the next two subsections, I will discuss how this inheritance hierarchy works to account for the given properties of the IHRC construction.

3.2. Argument composition and syntax of the IHRC phrase

Hinrichs and Nakazawa (1994) introduced the mechanism of argument composition into the HPSG framework. The effect of argument composition is to "attract" or "raise" the arguments of the governed verb to the argument list of the governing verb: roughly, when a lexical category X takes Y as its argument, the non-discharged arguments of Y are raised to the argument(s) of X.

The notion of argument composition is used in Chung (1998) to account for the verbal complexes in Korean. On this approach to verbal complexes, the auxiliary verb (AUX) selects its verb by the GOV(ERNEE) feature, and the subject and complement lists of the selected verb are list-appended (or "raised") to those of the AUX. In this analysis, the argument structures of most of the AUXs are determined by the governed verb. And the AUX and its governed verb combine first, constituting a complex predicate.

Based on the observation of the parallelisms between the verbal complex and "verb+kes" in the IHRC, I propose the feature structure of the expletive dependent noun *kes* in (18):

$$(18) \left[\begin{array}{l} \text{HEAD } \textit{noun} \\ \text{VAL} \left[\begin{array}{l} \text{SUBJ } \langle \rangle \\ \text{SPR } \langle \rangle \\ \text{COMPS } \langle \rangle \\ \text{GOV } \langle \text{V}[\text{VFROM } \textit{adnom}] \rangle \end{array} \right] \\ \text{CONT} / \left[\begin{array}{l} \text{INDEX } \textit{non-referential} \\ \text{RESTR } \{ \} \end{array} \right] \end{array} \right]$$

Feature structure (18) simply states (i) that *kes* takes only a verb of adnominal form as its verbal complement (GOV) and (ii) that its default index value is non-referential, which entails that its default restriction value is an empty set. (Here the default value is represented by "/"). This default CONT(ENT) value can be

overridden by the construction-specific constraint of *ihrc-kes-complex-noun-cx* in (17), which states that the CONT value of an element in a VAL(ENCE) list of the adnominal verb is structure shared with that of *kes*.

On my complex-noun approach, the adnominal verb *nao-nun* and *kes* in (1) constitute a syntactic unit, namely a complex noun (CN henceforth). The VAL value of the CN is identical to that of the adnominal verb due to the argument composition constraint on *head-gov-str*. Note that here nominative case, not genitive case, is assigned to *totwuk* even though it is a sister to a noun. In my analysis, *totwuk* is the element of the SUBJ list of the CN, not that of SPR, because the valence structure of *kes* is identical to that of the verb *nao-nun* due to the argument composition constraint.

My analysis predicts that the combination of "verb+*kes*" will have mixed categorial properties. Its external category is nominal in that the HEAD value is *noun*, while its internal argument structure is verbal in that its VAL value is attracted from the adnominal verb through argument composition. Then this approach can relatively naturally account for the subject-to-object raising fact in the IHRC construction if we assume that the raising is a structure-sharing between the element in the SUBJ list of an embedded category and an element in the COMPS list of the matrix verb.⁴

The complex noun approach to the IHRC construction also has a theoretical advantage over Uda's (1998) complement clause approach. In HPSG, there is no natural way to guarantee the coindexation between *kes* and an element within the relative clause if we assume that *kes* takes an S as its complement. An S is a fully saturated sign where the dependents of the embedded verb (subject or complements) are already discharged, and thus the index value of a dependent is not locally accessible from *kes*. On the complex-noun approach, however, the index value of a dependent of the embedded verb is locally accessible from *kes* because *kes* takes as its complement the adnominal lexical verb where its dependents are not discharged yet.

My approach also accounts for the fact that the IHRC does not involve the unbounded dependency (e.g. (2b)). The coindexation between *kes* and an element within the relative clause is only locally guaranteed by argument composition rather than by the REL and SLASH features, which are used to license the EHRC construction in HPSG. In my analysis, the coindexation is possible only locally between *kes* and one of the arguments subcategorized for by a verb which is in turn selected by *kes*.

In the next section, I will discuss how the semantics part of the IHRC properties is accounted for by the mechanism of the multiple construction type inheritance.

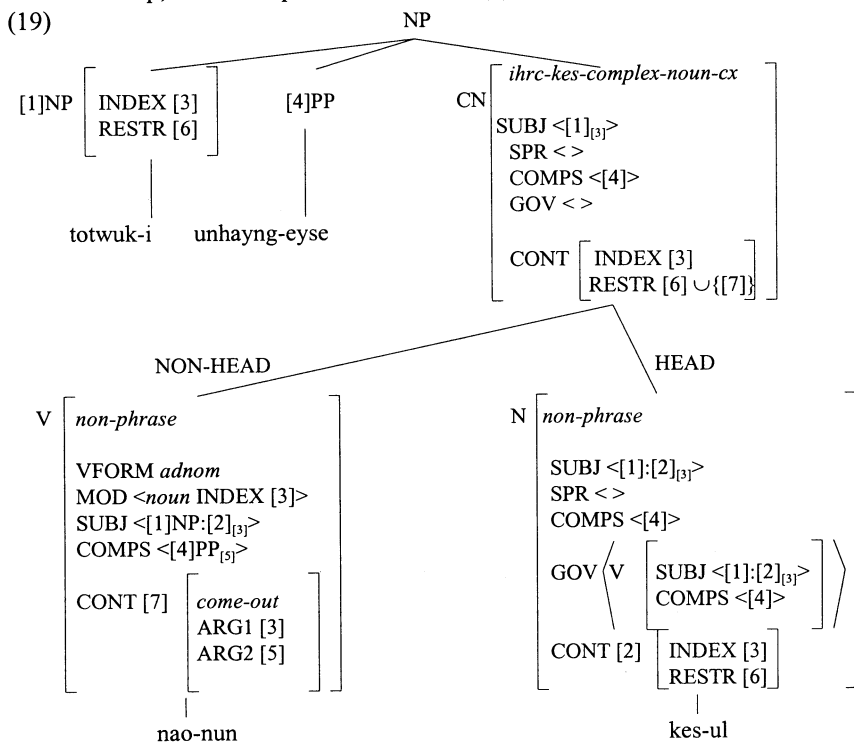
3.3. Semantics of the IHRC

Section 3.2 claims that the adnominal verbal expression in the IHRC has the

property of the verbal complement (governee) at the level of syntax. However, at the semantics level, it functions as an adjunct. With my approach, the dual function of the adnominal verb is accounted for by the multiple inheritance and by the default mechanism. According to the type hierarchy in (17), the complex noun of the IHRC phrase is a subtype of *head-gov-str*, which is a subtype of *head-nexus-str* and also a subtype of *head-adnom-str*, which is a subtype of *head-adjunct-str*. Note that the default value is used in *head-nexus-str* to represent that its CONT is the same as that of the head daughter. It means that the default value can be overridden by the CONT value of *head-adnom-str*, which has a constraint on the CONT value conflicted with that of *head-nexus-str*.

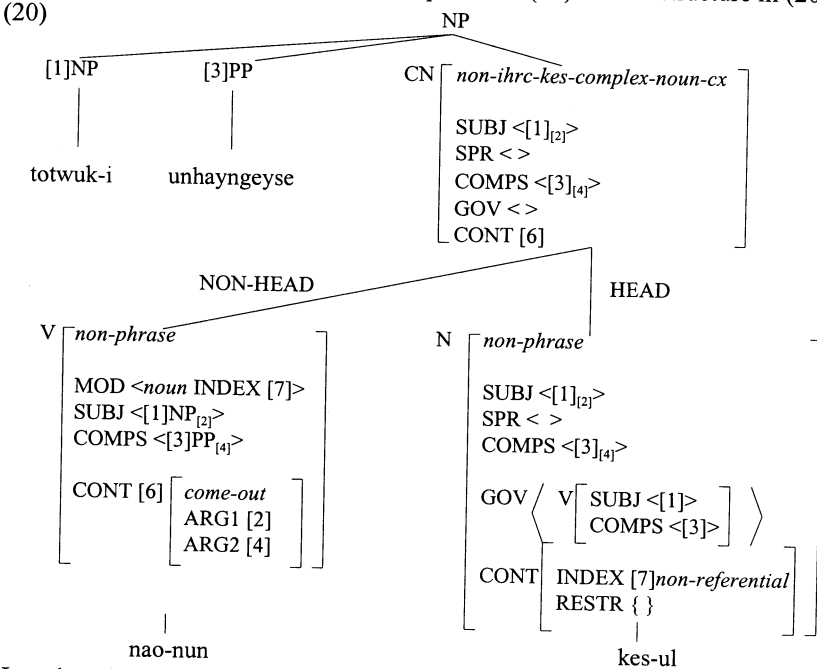
Hierarchy (17) indicates that the IHRC phrase's complex word (verb+*kes*) has only the one construction-specific constraint that the CONT value of an element in a VAL list of the adnominal verb is structure shared with that of *kes*. Then the semantics of the relative construction is inherited from *head-adnom-str*, and thus the whole complex noun has the semantics of the traditional relative construction.

To sum up, the IHRC phrase in sentence (1) has the structure in (19):



Following Uda (1998), the event reading of the NP headed by *kes* (e.g., (1) vs. (15)) is accounted for by the assumption that the event reading arises from the

structure-sharing between the semantic contents of the adnominal verb and *kes*. To this end, I assume another complex-noun construction which, differing from that of the IHRC construction, does not have the constraint of the CONT sharing. Also note that its CONT value is inherited from *head-adjunct-str*, not from *head-adnom-str*. On this approach, the IHRC phrase in (16) has the structure in (20):



Here the adnominal verb modifies a non-referential noun *kes* which does not have any specific meaning, and thus the CONTENT of the verbal complex is the same as that of the adnominal verb. That is, the complex noun has a proposition as its CONT value.

Note that here the CONT value of *head-nexus-str* is also overridden by the CONT value of *head-adjunct-str* because the constraint on the CONT value of *head-nexus-str* is specified as a default.

4. Conclusion

This paper proposes that the idiosyncratic properties of the Korean IHRC construction, such as the properties of the mixed-category/function and middle-distance dependency, are naturally accounted for through the notions of multiple inheritance and argument composition. It is also proposed that the default mechanism is crucial for a unified account of *kes* in the entity vs. event readings.

Note that my analysis assumes only one construction specific constraint on the complex noun in the IHRC phrase: the CONT value of an argument of the

adnominal verb is structure shared with that of *kes*. Then the idiosyncratic properties of the Korean IHRC construction are accounted for by collaboration of cross-linguistically well-motivated devices such as the default mechanism, multiple inheritance, and argument composition.

Through the proposed analysis, we can avoid using the under-motivated empty categories such as *pro* and empty predicate (Murasugi 1994 and Chung 1996, among others) and the exocentric rule such as NP→S (Jhang 1991 and Kuroda 1992).

Notes

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¹ See Chung (To appear), Ohara (1996), Kim (1996), and Kuroda (1992) for the discourse properties of the Japanese and Korean IHRCs.

² In Korean, as in other languages, a non-subject can also be coindexed with the head of the IHRC phrase, *kes*.

³ My analysis assumes that argument composition is a property of certain constructions such as the verbal complex, light verb constructions, and the IHRC's complex noun. However, Andreas Kathol (in personal communication) points out that argument composition may be a property of some specific lexical entries. Our constructional approach can be converted to the lexical approach with no difficulty through revision of the lexical structure of *kes* in (18).

⁴ Of course argument composition itself does not fully account for the raising fact. To this end, we need to assume an IHRC raising lexical rule which states the following: (i) a physical-action verb that takes as its complement an NP headed by *kes* also takes an N' as its complement, and (ii) the subject of N', which is coindexed with the NP headed by *kes*, is list appended to the COMPS list of the physical action verb. A deeper generalization remains for further study.

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