

Internally-Headed Relatives Instantiate Situation Subordination

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1 Introduction

Korean has two types of relative clause constructions: the Externally Headed Relative Clause Construction (EHRC), illustrated in (1), and the Internally Headed RC construction (IHRC), illustrated in (2). (The semantic heads are italicized).

(1) John-un [[tomangka]-nun *sey myeng-uy* *totwuk*]-ul
 J.-top [[run.away]-rel.imprf *three CL-Gen* *thief*]-acc
 capessta
 caught
 ‘John caught the three thieves who were running away.’

(2) John-un [[totwuk-i *sey-myeng* *tomangka*]-nun **kes**]-ul
 J.-top [[thief-nom *three-CL* *run.away*]-rel.imprf **kes**]-acc
 capessta
 caught
 ‘John caught the three thieves **when they** were running away.’

The IHRC differs from the EHRC both syntactically and semantically.

In this paper, I argue that these differences stem from two factors:

- The semantics of the relative operator (REL) in the IHRC,
- The semantics of the pronominal definite description *kes*, which obligatorily occurs in the usual external head position in the IHRC.

The gist of the proposal:

- The REL in the IHRC is a quantifier that ranges over sets of eventualities.
- The pronominal definite description *kes* contains an event argument, which is saturated by the trace created by raising the IHR-clause at LF.

2. Distinctive properties of the IHRC in comparison with the EHRC

Syntactic properties:

- The IHR-clause clause is gapless.
- The semantic head is inside the RC and is referred to by the grammatical element *kes*, which occurs in the usual external head position.

Semantic properties:

- The RC restricts the embedding clause's content, not the head noun's (Hoshi 1996, Shimoyama 1999, Y. Kim 2003): e.g., in (1), it restricts the matrix event time. → reminiscent of appositive clauses.
- The RC's content bears a limited set of semantic relations to the embedding clause' content (Kuroda 1992:147): e.g., in (1), the embedded event is simultaneous with the matrix event. → reminiscent of free adjuncts.
- *Kes* refers to the maximal individual that has the salient property provided by the RC (Hoshi 1996, Shimoyama 1999): e.g., in (1), it refers to all the three thieves that were running away, not just some of them. → reminiscent of E-type pronouns.

3. Previous analyses of the IHRC

Previous studies can be divided into two types depending on the role of the IHR-clause and the grammatical element in the embedding clause, i.e., *kes* in Korean.

3.1. About the semantics of the IHR-clause

- **Shimoyama (1999)** observes that like appositive clauses in English, the RC in the Japanese IHRC is interpreted as an independent clause, Adopting Demirdache's (1990) treatment of appositives, she assumes that the RC raises at LF to a position higher than the root clause. It combines with the root clause by predicate conjunction.

- **Strivastav (1991)** contends that IHRC's are like correlatives in Hindi, which are generalized quantifiers of type $\langle\langle e,t \rangle, t \rangle$ (e.g., *every boy*). An IHRC is therefore base-generated and interpreted at a position higher than the root clause and from this position it binds the demonstrative pronoun in the root clause.

Point to remember

What's common in both lines of analyses is that the IHR-clause is interpreted in a position higher than the root clause.

3.2. About the semantics of *kes*

There are three competing analyses in the literature:

- Nominalizer analysis: Kim 1984; see Shimoyama 1999 for the Japanese IHRC.
- Complementizer analysis: e.g., S. Lee 1983, K. Lee 1991, H. Yoon 1991, Jhang 1994
- Pronoun analysis: e.g., Lee 1980, Yang 1993, Chung and Kim 2003, Kim 2003.

Other indirect but illuminating analyses of *kes*:

- The morpheme *no*, which is the Japanese counterpart of *kes*, instantiates an E-type anaphor (Hoshi 1996, Shimoyama 1999). So *kes* can also be analyzed as an E-type pronoun.
- Just like its Japanese counterpart *no*, *kes* also seems to behave like a bound variable, a referential pronoun, or an E-type pronoun, depending on the type of its antecedent, which can be an R-expression, *wh*-word or a pronoun as well as a quantifier phrase (see Kitagawa 2002 for the Japanese IHRC).

Conclusion from the literature

Kes shows semantic variability ranging from a referential pronoun to an E-type pronoun.

4 A new analysis

I offer an account from which the distinct properties of the IHRC emerge. The new proposal builds on the insight of the previous studies but improves on them by motivating some of the stipulations.

The gist of the new proposal

- The RC is a generalized quantifier over sets of eventualities.
- RC raises at LF to a higher position where it combines with an event-level denotation of the embedding clause.
- The pronoun *kes* contains an event argument, which is bound by the trace of the raised RC.

4.1 The semantics of the IHR-clause

I propose that:

- The relative operator (REL), which is realized as *-nun* (and its morpho-phonemic variants), a strong quantifier that ranges over sets of eventualities.
- The clausal material that precedes REL denotes a set of eventualities.
- The entire IHR-clause is a generalized quantifier which denotes a function from a set of eventualities to truth-values (compare Strivastiv 1991).

(3) The denotation of REL¹

$[[REL]] = \lambda f_{\langle st \rangle} \lambda g_{\langle st \rangle} . \text{there is an eventuality } s \text{ such that } f(s) = 1 \text{ and } g(s) = 1 \text{ (undefined if } f \neq \emptyset \text{)}.$

(3) reads as: REL is a function that takes a set of eventualities *f* and returns a function that takes a set of eventualities *g* and *f* is not empty such that there is an eventuality *s* such that *s* is an element of *f* and is also an element of *g*.

¹ An alternative view: REL is a relation *R* that holds between two sets of eventualities. The value for *R* is limited to simultaneity and causation.

(i) $[[REL]] = \lambda f_{\langle st \rangle} \lambda g_{\langle st \rangle} [f \neq \emptyset]. R \langle f, g \rangle$, where $R = \{\text{simultaneity, causation}\}.$

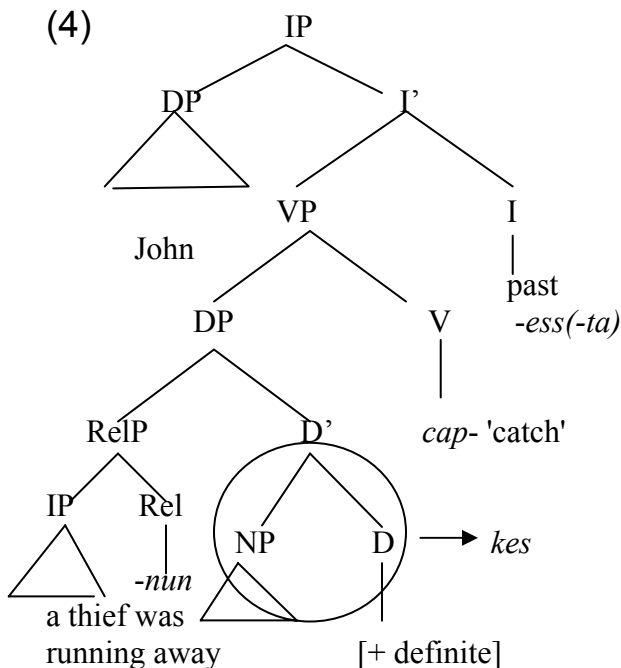
4.2. The morpho-syntax of *kes*

I propose that:

- *Kes* is a pronoun that spells out a definite article followed by an elided NP.
 - Support: Pronouns can optionally contain a NP sister, which is deleted in phonology (for whatever reason NP-ellipsis occurs) (Elbourne 2002).
 - Advantage of this approach: We can derive the semantics of *kes* in a uniform way, regardless of the types of its antecedent, because pronouns intrinsically have this semantic flexibility.
- The RC and *kes* string is base-generated as an argument of the embedding verb; they form a syntactic constituent. (Chung and J.-B. Kim 2003, M.-J. Kim 2002)

Taking these pieces together, I propose (4) as the syntactic structure of a sentence containing an IHR-clause in the direct object position such as (2).

The overt syntactic structure of (2):



4.3 The semantics of *kes*

I propose that:

- *kes* is a definite description that contains an event argument.²
- The denotation of *kes* contains Link's sum operator σ .³
- The denotation of *kes* contains a free variable P, which corresponds to the value of the elided NP. The value for P is provided by the context set up by the IHR-clause.

(5) The denotation of *kes*

$[[kes]] = \lambda s.\sigma x[x \text{ has the salient property } P \text{ in } s]$, where s and x are an eventuality and entity variables, respectively, and P is a free property variable.

Under this proposal, *kes* in (2) denotes something like: $\lambda s[\text{the maximal } x \text{ such that } x \text{ has the salient property of being a thief in event } s]$.

4.4 Linking the relative clause with *kes*

I propose that:

- Due to a semantic type mismatch, the IHR-clause raises to a position where it can combine with an event-level denotation of the root clause. For concreteness, I assume that it raises all the way to the root clause-level, though I'd like to remain non-committal about the landing site.
- The raised RC's trace is interpreted as an event variable, which is bound by the index node created below the raised RC (Heim and Kratzer 1998).
- This event variable saturates the event argument inside the denotation of *kes*.

² See Heim 1990, Elbourne 2002 for analyses that posit a situation variable inside E-type pronouns in English.

³ See Shimoyama (1999) for a similar treatment of *no* in Japanese. σ can be replaced by an iota operator if the latter's denotation can capture the maximality effect exhibited by *kes*.

Welcome result 2: The present proposal explains the parallel between the IHRC and correlatives in Hindi, illustrated in (8).

- (8) [[**jo** laRkii khaRii ha] **vo** lambii hai]
REL girl standing is **DEM** tall is
 'The girl who is standing is tall.'

The parallels between the two constructions:

- They are both head internal, although correlatives need not be.
- The embedding clause contains a pronoun, whose restrictor is provided by the RC.
- The content of the RC is presupposed (see Strivastav 1991, Kim 2003).
- They both instantiate definite descriptions (see Dayal 1995 for correlatives; Hoshi 1996, Shimoyama 1999 for the IHRC)).

The standard analysis of correlatives is that they are base-generated higher than the embedding clause via adjunction (Strivastav 1991, Keenan 1985), as shown in (8).⁴

- (9) [_{IP} [_{C_{Pi}} which girl is standing]][_{IP} she_i is tall]

In light of the proposed analysis, what seems to differ between correlatives and the IHRC is where the proposal syntactic structure is represented; that is, in correlatives, it is represented in overt syntax whereas in the IHRC in covert syntax.

Welcome result 3: The present proposal is not subject to the problem of having a quantifier phrase bound by the pronoun *kes*, as shown in (10).

- (10) John-un [[**montun sonyne-ka** naka]-nun **kes**]-ul
 J.-top [[**every girl-nom** go.out]-REL.imprf **kes**]-acc
 mak-ess-ta
 stop-pst-dec
 'John stopped every when she was going out.'

⁴ Authors like Dwivedi (1994) and also Bach and Cooper (1978) argue this structure is created by an asymmetric coordination, rather than adjunction.

Under the present proposal, the QP *motun sonye* 'every girl' raises higher than the pronoun *kes*, and hence it will not be c-commanded by it when it is interpreted. This way we can avoid the apparent binding problem where the QP is bound by the pronoun.

Welcome result 4: We can explain why the IHR-clause is interpreted in such a way that it restricts the eventuality described by the root clause. This is because the IHR-clause is syntactically located higher than the root clause and is interpreted like a sentential modifier.

6. Remaining Issues

Issue 1: What's the evidence for the QR of the IHR-clause? Does it pattern with other instances of QR in Korean if there is any?

It seems that the IHR-clause takes wide scope with respect to sentential negation in the root clause, as shown in (11)

- (11) John-un [[Mary-ka naka]-nun kes]-ul **mak-ci**
 J.-top [[M.-nom go.out]-REL.imprf kes]-acc **stop-CI**
anh-ess-ta
do-pst-dec
 'John didn't stop Mary when she was leaving.'

But does this corroborate the claim that the IHR-clause actually raises above the matrix sentential negation?

Issue 2: Application of the present proposal to sentence (2) results in the truth-conditions given in (12):

- (12) There is an eventuality *s* such that it is an event of a thief running away and there is another eventuality *s'* such that it is an event of John catching the maximal individual *x* such that *x* has the salient property of being a thief in the event *s*. (Undefined if there is no eventuality *s*.)
 These truth-conditions match my intuition about the meaning of the sentence. But does the present proposal work in all instances of the IHRC?

Consider (13), where there is an interval between the event described by the IHR-clause and the event described by the root clause.

(13) Context: John and Mary are siblings. Today they had a fight. John got really upset with Mary, so he threw away the toy that Mary played with yesterday.

*/??John-un	Mary-ka	ecey	cangnankam-ul	kaciko
J.-top	M.-nom	yesterday	toy-acc	with
no-n	kes-ul	peliessta		
play-REL.pst	KES-acc	threw.away.		

Intended: 'John threw away the toy that Mary played with yesterday'

The present proposal cannot account for the ungrammaticality or unacceptability of (13), because its truth-conditions are as follows:

(14) There is an eventuality *s* such that it is an event of Mary playing with the toy and there is another eventuality *s'* such that it is an event of John throwing away the maximal individual *x* such that *x* has the salient property of being a toy in the event *s*. (Undefined if there is no eventuality *s*.)

This suggests that the two sets of eventualities described by the RC and the root clause need to be connected more tightly than they are in the present proposal.

7. Concluding remarks

The goal of this paper was to account for why the IHRC differs from the more familiar EHRC both syntactically and semantically.

I have proposed that:

- The IHR-clause is a generalized quantifier that takes a set of eventualities as its argument. Hence it raises at LF to a position where it can combine with an event-level denotation of the root clause.
- *Kes* is a pronominal definite description, which contains an event argument. And this event argument is bound by the trace of the raised RC clause and hence gets indirectly linked to the IHR-clause.

Although there are some remaining issues, the present proposal sheds new light on the semantics of other types of relative clauses such as correlatives, free relatives and probably externally headed relatives as well.

Selected references

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