A Head-Driven and Constraint-Based Analysis of Korean Relative Clause Constructions.*

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Abstract

Relative clause constructions have been notorious for their complexity in terms of syntax and semantics. This paper develops a treatment of the syntactic and semantic properties of Korean relative clause constructions, differing in several key respects from those of English. This treatment, developed within the tradition of a constraint-based framework, Head-driven Phrase Structure Grammar theory, adapts Sag's (1997) approach to grammatical constructions in English relatives. As in Sag's analysis, our analysis is 'head-driven' and 'constraint-based' in the sense that the head of a lexical (relative-clause) head and declarative constraints on well-defined constructions play a crucial role in the formation of relative clauses. This system enables us to eliminate the invisible element (e.g., trace or empty operator) from the analysis of Korean relative clauses and further to express cross-cutting generalizations among grammatical constructions thru the mechanism of hierarchical inheritance of type constraints. One of the main consequences of this analysis is to provide a straightforward account for local as well as non-local relative clause constructions which have been known as violating the firm syntactic island constraints such as the Complex Noun Phrase Constraints

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(CNPC) but for which no plausible and comprehensive analysis hasn't been provided yet.

1 Introduction

One obvious property of Korean relatives is that like most of the head-final languages, Korean employs no relative pronouns like *who* or *which*. Further, the predicate of the relative clause preceding the head noun is marked with a morphological marker depending on the type of tense information.[1]

(1) a. Tom-i __ $_i$ ilk-nun chayk$_i$
Tom-NOM read-Pres.PN book
'the book that Tom reads'

b. Tom-i __ $_i$ ilk-un chayk$_i$
Tom-NOM read-Pst.PN book
'the book that Tom read'

c. Tom-i __ $_i$ ilk-ul chayk
Tom$_i$ read-Fut.PN book
'the book that Tom will read'

The prenominal markers in (1) function both as relative pronouns and tense markers. Further the putative gap in the relative clause coindexes with the head noun.

Another interesting fact is that unlike English an adjunct element or an element from an adverbial clause can be rather freely relativized.

(2) a. John-i cam-ul ca-n pang
John-NOM sleep-ACC sleep-PN room
'the room in which John slept'

b. John-i [__ ilk-e moynse] cemsim-ul mek-un chayk
John-NOM read-COMP while lunch-ACC eat-PN book
'*The book that John ate while reading __ '.

Example (2)b is an instance of violating the island constraint. There are more cases where we can observe the violation of syntactic constraints such as the subjacency condition:[2]

[1]These three basic kinds of tense-sensitive prenominal markers can be extended to denote aspects when combined with tense suffixes. Thus the possible prenominal verb forms are *ilk-ten* 'read-progressive', *ilk-essten* 'read-past progressive', *ilk-essul* 'read-past conjecture', *ilk-essessul* 'read-past perfective conjecture', *ilk-ko issten* 'past perfective progressive'

[2]Another peculiar type of Korean relatives is the so-called gapless or pseudo relative clause construction:

(3) a. [[e_i e_j ipko iss-nun] os_j-i] mesci-n $sinsa_i$
wearing is-PN clothes-NOM stylish-PN gentleman
' (lit.) man_i who the clothes that [e_i] is wearing are stylish'

b. [[e_i e_j kacko iss-nun] $khemphwute_j$-ka] MAC-i-n $kyoswu_i$
posses is-PN computer-NOM MAC-COP-PN professor
' (lit.) $professor_i$ who the computer that[e_i] is possessing are MAC'

In the practice of Principles and Parameters (PP) theory and its descendants, Korean relative clauses have in general been taken to have the syntactic structure given in (4) (References):

(4) [[John-i [e_i] ilk-un] Op_i] $chayk_i$

As shown in (4), the Korean relative clause involves the movement of a null operator which coindexes with the head noun. However, such an empty and invisible entity has been postulated by a theory-internal point of view with no independent justification to my knowledge. Further the power of this operator movement needs to employ an additional mechanism to account for cases violating the subjacency condition (cf. Yoon 1994).

In this paper, I develop a treatment of these complex Korean relative clause constructions with no recourse to such a null operator whatsoever. It shows that without losing any descriptive as well as explanatory power, the invisible element can be eliminated under the framework of constraint-based lexicalist grammars like HPSG (Head-driven Phrase Structure) (see Sag 1997 for English relative clauses). Given Occam's razor, a simpler and more optimal theory would be the one that can avoid the supposition of invisible abstract elements which we can not see, hear, or listen to.

2 Theoretical Foundations of HPSG

This section deals with basic theory of HPSG (Head-driven Phrase Structure Grammar), the framework I adopt in this paper. Although an introduction to the main theoretical concepts

((i)) a. [komu-ka tha-nun] naymsay
rubber-NOM burn-PN smell
'(literally) the smell such that rubber is burning',
'the smell that characterizes burning of rubber'

b. [thayphwung-i cinaka-n] huncek
typhoon-NOM passed.by-PN debris
'(literally) the debris such that a typhoon passed by'

I will not discuss this construction here. For an analysis where this construction is treated syntactically as the appositive relative clause but semantically as a more like canonical relative clause, see Kim (1998).

is the primary purpose of this section, I do not provide an exhaustive introduction to the theory, but present only those aspects of the assumed framework that are of direct relevance to this research (for details of the theory and recent theoretical developments, readers are referred to Bouma et al. 1998, Davis 1995, Kim 1995, Kim and Sag 1996, Sag 1997, Pollard and Sag 1994, Sag and Fodor 1994, and the references cited there).

2.1 Structures and (Universal) Constraints

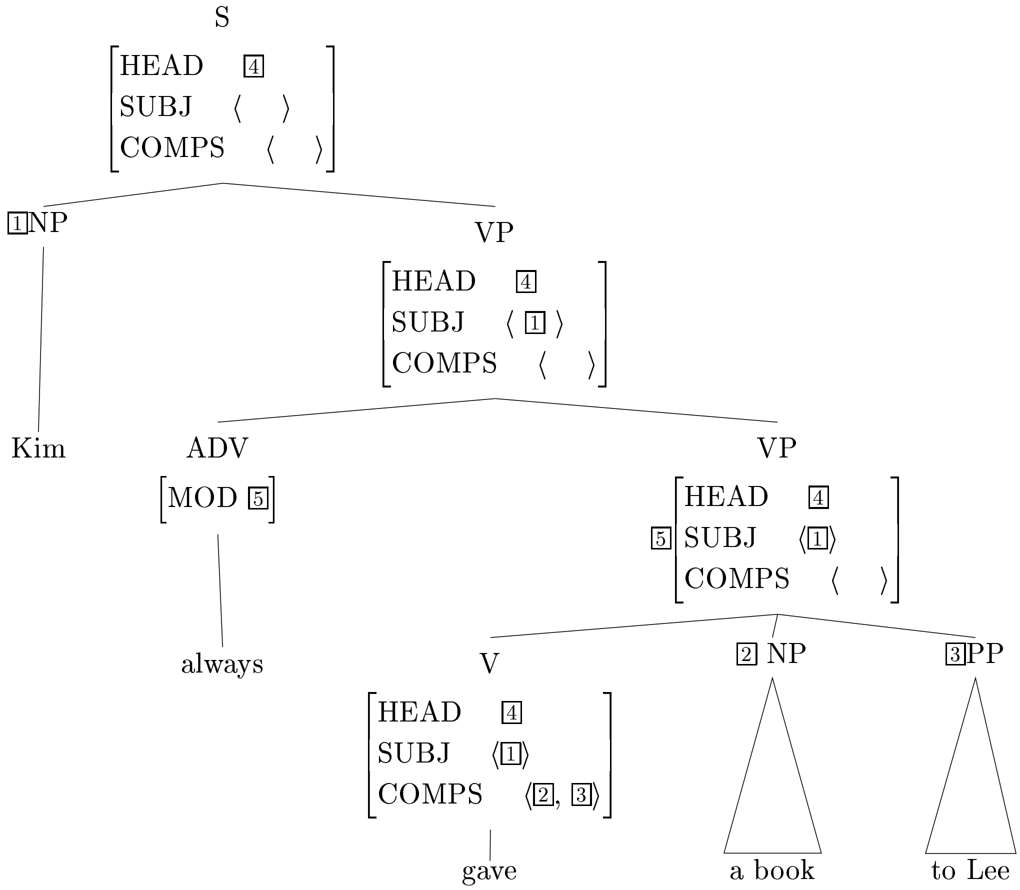
In HPSG, all linguistic objects are represented as feature structures. But for expository purposes, they are presented in terms of the familiar trappings of generative grammar – tree representations.[3]

[3]In HPSG, feature structures are notated by (sorted) attributed-value matrices (AVM), such as:

(i) $\begin{bmatrix} \textit{synsem} & \\ \text{PHON} & \textit{list} \\ \text{COMPS} & \langle \text{ VP } \rangle \\ \text{CONT} & \boxed{1} \end{bmatrix}$

The linguistic object *synsem* has three attributes, PHON(OLOGY), COMPS (COMPLEMENTS), and CONT(ENT). These attributes have their own values which can be either be simple (atomic) or complex value. The boxed integer is a variable used to 'tag' certain feature values within the structure as being token-identical. See P&S 1994 for detailed discussion of feature structures in HPSG.

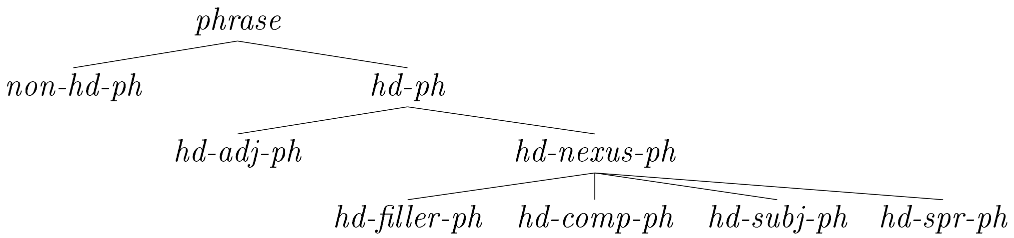
(5)



The thing that we need to notice is that each substructure of (5) belongs to a type of a phrase (*head-subject, head-adjunct, and head-complement phrase*), and further that it obeys all the universal as well as local constraints (most importantly the Head-Feature Principle (HFP), the Valence Principle (VALP), and the ID Principle (IDP) the type is required to adhere to: if a local structure(type) violates any constraint, it is illegal (in this sense we say HPSG is based on the total representation but on the partial-representation).

The constraints that the type of each phrase needs to observe are defined thru the multiple inheritance hierarchy of phrases in (6).

(6)



The hierarchy, which could be applied to languages such as English, Korean, and other languages, classifies phrases into *headed-phrase* and *non-headed phrase*. The *headed-phrase* have two subtypes: *head-adjunct-phrase* and *head-nexus phrase*. This latter type is further subtyped into *head-filler-phrase, head-subject phrase, head-complement-phrase*, and *head-specifier-phrase*.

Each of this phrase type obeys its own type-specific constraint. And this constraint will be inherited to all of its subtypes. For example, the phrase *hd-ph* is formulated to have the Head-Feature Principle of (7):

(7) Head Feature Principle:

$$\textit{hd-ph} \quad \Rightarrow \quad \begin{bmatrix} \text{HEAD} & \boxed{1} \\ \text{HD-DTR} & \begin{bmatrix} \text{HEAD} & \boxed{1} \end{bmatrix} \end{bmatrix}$$

This constraint simply says the HEAD value of a headed phrase is identified with that of its head-daughter. This constraint, basically restricting the percolation of the head value, is to guarantee that headed phrases are 'projections' of their head daughters. This ensures that grammatical properties such as part of speech, case, and verb-inflection-form value (VFORM) are systematically projected onto headed phrases from head lexical items.

There is another constraint that plays an important role in the grammar. The traditional X′ theory within the P&P framework is formulated in terms of hierarchical bar levels. But HPSG's X′ theory replaces this component with combinatoric saturation, governed by the Valence Principle:[4]

(8) Valence Principle:

$$\textit{hd-ph} \quad \Rightarrow \quad \begin{bmatrix} \text{SUBJ} & /\,\boxed{1} \\ \text{SPR} & /\,\boxed{2} \\ \text{COMPS} & /\boxed{3} \\ \text{HD-DTR} & \begin{bmatrix} \text{SUBJ} & /\boxed{1} \\ \text{SPR} & /\boxed{2} \\ \text{COMPS} & /\boxed{3} \end{bmatrix} \end{bmatrix}$$

This constraint, applied to the *headed-phrase*, guarantees that a phrase's value for a valence feature (such as SUBJ (SUBJECT) and COMPS (COMPLEMENTS), and SPR(SPECIFIER) is identical to that of the phrase's head daughter as default. However, the default specification allows the constraint to be overridden if its subtype says otherwise. For example, its subtype *hd-comp-ph* has its own specific constraint about the valence feature:

[4] / indicates the default value.

(9) Head-Complement Schema:

$$
\textit{hd-comp-ph} \quad \Rightarrow \quad \begin{bmatrix} \text{COMPS} & \langle \quad \rangle \\ \text{HEAD-DTR} & \begin{bmatrix} \text{COMPS} \; \langle \, \boxed{1}, \ldots, \, \boxed{n} \, \rangle \end{bmatrix} \\ \text{NON-HD-DTRS} & \langle \boxed{1}, \ldots, \boxed{n} \, \rangle \end{bmatrix}
$$

A *head-complement phrase* is the one that consists of a lexical head-daughter and any number of non-head complement daughters ($\boxed{1}$ from $\boxed{n}$). When this head combines with these complement daughters, the mother phrase's COMPS value is empty. Since this constraint is on the specific subtype of the head-phrase, it overrides the default valence constraint. In other words, the constraint on the subtype *head-comp-ph* sanctions the override of the valence constraint imposed on its supertype *hd-phrase*.[5]

Together with such constraints on the well-formed phrases, the Valence Principle 'checks off' the subcategorization requirements of a lexical head that carries feature specifications (valence features) that determine what elements it should combine with syntactically.

The hierarchy works as follows: in the hierarchy each phrase inherits constraints from its supertypes except the case that a default value is in conflict with its own non-default specification. For example, the Valence Principle can be overridden by a certain constraint such as the Head-Complement Schema. But there is no constraint that can override the Head-Feature Principle. In other words, the constraint on the *hd-ph* is inherited all its subtypes without any override. In this way, such a inheritance hierarchy allows us to capture generalizations about phrases. We will see that such an inheritance hierarchy also plays a role in the Korean grammar.

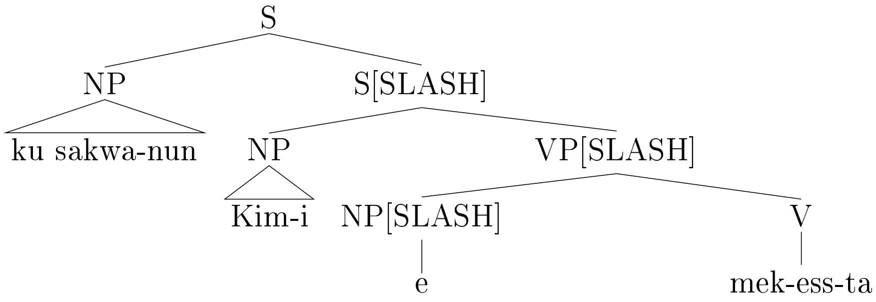
3 Basics of a Head-Driven, Traceless Theory

3.1 Trace-Based vs. Traceless-Based Analyses

In the tradition of earlier GPSG and HPSG, there are two main mechanisms in the analysis of extraction phenomena; the introduction of the empty element (eg., trace) in the lexicon and the feature SLASH projected upward in a syntactic structure. The following is a tree structure represented within this traditional view.

[5] There are also schemata for *head-subj-ph*, *head-spr-ph*, and *head-adj-ph*.

(10)

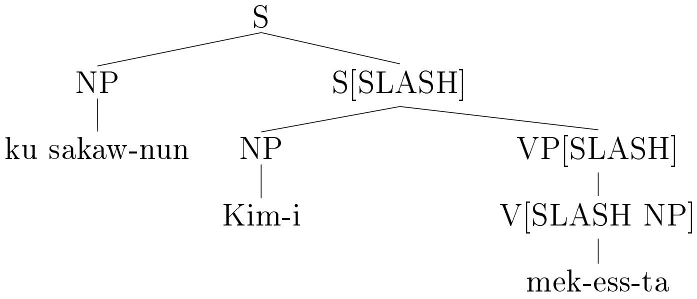


The verb *mek-ess-ta* 'eat-PST-DECL' combines with the trace NP that has no phonology value but bears SLASH feature. This SLASH feature, indicating there is an unbounded trace, is propagated up the tree until it is bound off or discharged by the filler NP, *ku sakwa-nun* 'the apple-TOP'. In such an analysis, the trace exists as an concrete linguistic object and is included in the lexicon together with other visible linguistic elements.

However, there is an issue of positing such an abstract element that we can neither see, nor hear, nor feel. As shown by Sag and Fodor (1994), the phenomena (auxiliary contraction, *wanna* contraction, and position of floated quantifiers) that have strongly motivated for the supposition of trace could be recast without recourse to the introduction of trace. As for Korean and Japanese, phenomena such as floating quantifiers and weak crossover effect have been also assumed to provide evidence for trace. Considering that there could exist analyses for these phenomena without resorting to trace (See Chung 1998 for an alternative analysis), the empirical and theoretical motivation for trace in the Korean grammar loses its power.

Needless to say, it would be more economic if we could account for the same phenomena without resorting to the invisible abstract element. This eventually led to the development of a traceless theory of extraction set forth by Sag (1997). In a traceless theory, the tree structure involves no empty element whatsoever as shown in (11).

(11)



The difference between the trace-based tree structure (10) and the one in (11) comes from the lexical information of the verb *mek-ess-ta*. The verb in (10) combines with a trace as its object NP complement within its local domain whereas the one in (11) does not. This verb, lexically encoded as lacking of one complement, is not required to combine with its complement. Further it is this very verb, not the trace NP, that bears the feature SLASH passing up to the target node. This lexical specification on the verb itself in turn enables the verb to combine with its NP complement beyond its local domain (see what follows).

3.2 General Constraints for Extraction

Let us see in detail what constraints make it possible for such a system to be worked out.

The trace-based account assumes that the empty element itself has the information that it is phonetically unrealized. But in a traceless account, the lexical head itself has the information on which element of its arguments is phonetically unrealized. The information of a lexical head or word, thus, plays a crucial role in the analysis of extraction. As noted earlier, words in HPSG are represented by feature structures which contain their appropriate phonological, morphological, syntactic and semantic information. A shorthanded lexical entry will look like the following:

(12) mek-ta 'eat-DECL'

$$\begin{bmatrix} \text{HEAD} & \textit{verb} \\ \text{VAL} & \begin{bmatrix} \text{SUBJ} & \langle \boxed{1}\text{NP}[\textit{nom}]_{\boxed{3}} \rangle \\ \text{COMPS} & \langle \boxed{2}\text{NP}[\textit{acc}]_{\boxed{4}} \rangle \end{bmatrix} \end{bmatrix}$$

Each lexical entry will project its own particular kind of phrase due to its specifications for HEAD and VALENCE features (SUBJ and COMPS), and their interaction with a set of universal principles (e.g., HFP and VALP). The list concatenation of VALENCE whose value is cancelled in syntax is the value of ARG-ST (argument structure).[6] This can be formalized by the Argument Conservation Constraint in (13) (cf. Bouma et al. 1998).

(13) Argument Conservation Constraint:

$$\textit{word} \Rightarrow \begin{bmatrix} \text{VAL} \begin{bmatrix} \text{SUBJ} & \boxed{1} \\ \text{COMPS} & \boxed{2} \end{bmatrix} \\ \text{ARG-ST} \quad \boxed{1} \oplus \boxed{2} \end{bmatrix}$$

The constraint defines the relationship between valence and argument structure (for all words): argument structure corresponds to the append of the two valence features SUBJ and COMPS (the function $\oplus$ denotes list append.)

Another thing we need to notice is that the type *synsem* (the type of the syntactico-semantic complexes that occur on all valence and ARG-ST lists in HPSG) has two basic subtypes: *canonical-synsem (cannon-ss)* and *gap-synsem(gap-ss)*:

[6] There exists a certain redundancy between VALENCE and ARG-ST. However, this level plays a crucial role in accounting for binding theory and pro-drop phenomena. See Manning and Sag 1995

(14)

$$\begin{array}{ccc} & \textit{synsem} & \\ \swarrow & & \searrow \\ \textit{canon-ss}\begin{bmatrix}\text{LOCAL } \boxed{1}\end{bmatrix} & & \textit{gap-ss}\begin{bmatrix}\text{LOCAL } \boxed{1} \\ \text{NONLOC} \mid \text{SLASH } \boxed{1}\end{bmatrix}\end{array}$$

The type *canon-ss* is the type associated with all overt elements that combine syntactically with heads, whereas *gap-ss* is the type that is not realized as an overt expression.

Armed with this classification, we can now revise the Argument Conservation Constraint as the following realization constraint (cf. Bouma et al. 1998):

(15) Argument Realization Constraint:

$$\textit{word} \Rightarrow \begin{bmatrix}\text{SUBJ} & \boxed{1} \\ \text{COMPS} & \boxed{2} - \textit{list(gap-ss)} \\ \text{ARG-S} & \boxed{1} \oplus \boxed{2}\end{bmatrix}$$

The constraint in (15) basically allows a non-subject argument of a lexical head to be realized either as a complement or a gap. In other words, the non-first element in the argument structure (which is the non-subject element) can be realized as a local element in COMPS or as a nonlocal element as a gap.[7]

An illustration with one example will make it clear how this constraint works. The lexical entry for the verb *mek-ess-ta* ‘eat-PAST-DECL will be look like the following:

(16) mek–ess-ta:

$$\begin{bmatrix}\text{HEAD} & \textit{verb} \\ \text{SUBJ} & \langle\boxed{1}\rangle \\ \text{ARG-S} & \langle\boxed{1}\text{NP[nom]}\ ,\ \boxed{2}\text{NP[acc]}\rangle\end{bmatrix}$$

The above feature structure can satisfy the Argument Realization Constraint either as shown in (17)a or (17)b.

(17) a. mek-ess-ta b. mek-ess-ta

$$\begin{bmatrix}\text{HEAD} & \textit{verb} \\ \text{SUBJ} & \langle\boxed{1}\text{NP}[\textit{nom}]\rangle \\ \text{COMPS} & \langle\boxed{2}\text{NP}[\textit{acc}]\rangle \\ \text{ARG-S} & \langle\boxed{1}\ ,\ \boxed{2}\textit{canon-ss}\rangle\end{bmatrix} \quad \begin{bmatrix}\text{HEAD} & \textit{verb} \\ \text{SUBJ} & \langle\boxed{1}\text{NP}[\textit{nom}]\rangle \\ \text{COMPS} & \langle\ \rangle \\ \text{ARG-S} & \left\langle\boxed{1}\ ,\ \boxed{2}\begin{bmatrix}\textit{gap-ss} \\ \text{LOC } \boxed{3} \\ \text{SLASH } \left\{\boxed{3}\right\}\end{bmatrix}\right\rangle\end{bmatrix}$$

[7]As noted in Bouma et al. 1998, we need a further constraint ensuring that none of the *gap-ss*'s on ARG-S appears on COMPS.

In the feature structure (17)a, the second argument NP is realized on COMPS as a canonical synsem element. We observe this kind of feature structure in sentences with no extraction as in (18)a. The plain verb *mek-ess-ta* combines with its overt NP complement and a subject here. But the one in (17)b where the object is realized as a gap is the kind of feature structure that occurs in sentences with extraction as in (18)b. This verb *mek-ess-ta* is different from the one in (18)a, mainly in that its NP complement is unrealized but only reflected in the argument structure (ARG-S) as a *gap-synsem*. In other words, this verb need not combine with its NP complement in a local domain.

(18) a. John-i ku sakwa-lul mek-ess-ta
John-NOM the apple-ACC eat-PAST-DECL

b. Ku sakwa-nun John-i __ mek-ess-ta
that apple-TOP John-NOM __ eat-PAST-DECL

A further point we need to consider here is that the Argument Conservation and Realization Constraints we have observed so far are applicable only to the word level. Thus the remaining issue here is how to pass up the information of the lexical head to the phrasal or clausal level. To do this the lexical head at first needs to encode the information that whether its complement(s) has SLASHed (phonetically unrealized) or not. The SLASH amalgamation constraint on word satisfies this purpose.

(19) SLASH Amalgamation Constraint:

$$word \Rightarrow \begin{bmatrix} \text{LOC} \left[\text{ARG-ST} \left\langle [\text{SLASH } \boxed{1}], ..., [\text{SLASH } \boxed{n}] \right\rangle \right] \\ \text{NONLOC } [\text{SLASH } \boxed{1} \uplus, ... \uplus \boxed{n}] \end{bmatrix}$$

This constraint ensures that if an argument is 'slashed', the head which selects the argument will also be slashed. Thus, the constraint will allow (18)a and (18)b to have the following feature specifications, respectively.

(20) a. mek-ess-ta

$$\begin{bmatrix} \text{HEAD} & verb \\ \text{SUBJ} & \langle \boxed{1}\text{NP}[nom] \rangle \\ \text{COMPS} & \langle \boxed{2}\text{NP}[acc] \rangle \\ \text{ARG-S} & \langle \boxed{1}, \boxed{2} \rangle \\ \text{NONLOC} \,|\, \text{SLASH} & \{ \ \} \end{bmatrix}$$

b. mek-ess-ta

$$\begin{bmatrix} \text{HEAD} & verb \\ \text{SUBJ} & \langle \boxed{1}\text{NP}[nom] \rangle \\ \text{COMPS} & \langle \ \rangle \\ \text{ARG-S} & \left\langle \boxed{1}, \boxed{2} \begin{bmatrix} gap\text{-}ss \\ \text{LOC } \boxed{3} \\ \text{SLASH } \{ \boxed{3} \} \end{bmatrix} \right\rangle \\ \text{NONLOC} \,|\, \text{SLASH} \{ \boxed{3} \} \end{bmatrix}$$

The next step we need to do is to pass up this amalgamated SLASH value the higher node, say, VP and then S. This job is assigned to the SLASH inheritance constraint on the type of *head-nexus-ph*:

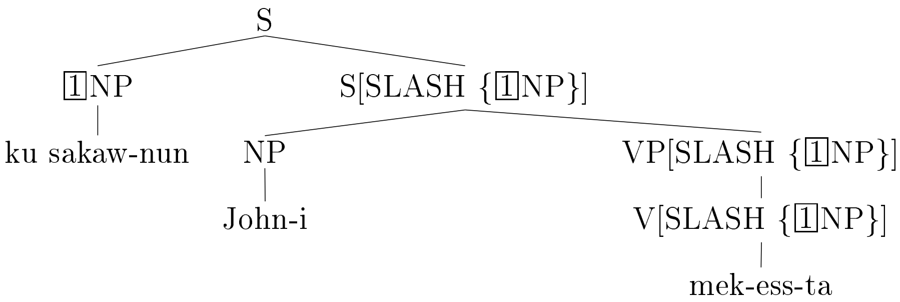
(21) SLASH Inheritance Principle (SLIP):

$$\textit{hd-nexus-ph} \Rightarrow \begin{bmatrix} \text{NONLOC} \begin{bmatrix} \text{SLASH } \boxed{1} \end{bmatrix} \\ \text{HD-DTR} \begin{bmatrix} \text{SLASH } \boxed{1} \end{bmatrix} \end{bmatrix}$$

This constraint basically guarantees the feature's configurational percolation. That is, it makes sure that the SLASH value of a phrase is the SLASH value of its head-daughter.[8]

When all these constraints in hand, we will have the following structure for (18)b.

(22)



The traceless extraction works with the tight interaction among the given constraints: The Argument Realization constraint allows the verb *mek-ess-ta* to have one of its complement to be realized as a nonlocal element (or gapped). This nonlocal element encoded as a SLASH value is lexically amalgamated. The amalgamated element will in a sense pass up to the higher structure by the SLASH Inheritance Constraint. When the SLASH value in the highest structure will be bound off when the SLASH-ed value meets its filler in a head-filler structure (see the constraint on the *head-filler structure* in the footnote.).

[8]This constraint can be overridden by the constraint on the *hd-filler-ph*:

(i)

$$\textit{hd-filler-ph} \Rightarrow \begin{bmatrix} \text{NONLOC} & \begin{bmatrix} \text{SLASH } \phi \end{bmatrix} \\ \text{HD-DTR} & \begin{bmatrix} \text{SLASH} \left\{ \boxed{1} \right\} \\ \text{NON-HD-DTRS} \quad \langle \text{ LOC } \boxed{1} \ \rangle \end{bmatrix} \end{bmatrix}$$

The constraint says that the SLASH value of a *hd-filler-ph* is not that of its head daughter itself but the one minus this discharged value.

3.3 General Constraints on Prenominal Suffixed Word

We have observed that the predicate of the relative clause preceding the head noun the clause modifies is marked with a morphological marker depending on the type of tense information. In HPSG, each lexical entry is fully inflected, and thus no 'dangling affixes' or 'disembodied features' are allowed. Prenominal (PN) suffixed words are defined to be free-stems and also members of the sort *v-mod-word*. This sort can be classified into four subsorts according to tense information that each suffix carries, as in (23).

(23)
$$\begin{array}{ccc} & \textit{v-mod-word} & \\ \textit{rel-present} & \textit{rel-past} & \textit{rel-fut} \end{array}$$

Each subtype of this *v-mod-word* thus will be realized as V-*nun*, V-*(u)n*, and V-*(u)l*, depending on its tense value. However, each will all at least have the following constraint in (24) inherited from this supertype *v-mod-word*.[9]

(24)
$$\textit{v-mod-word} \Rightarrow \begin{bmatrix}\text{HEAD} \quad \textit{verb}\begin{bmatrix}\text{MOD } \textit{nominal}\end{bmatrix}\end{bmatrix}$$

Thus, the function of the prenominal suffix is simply to add the modification information to its stem. The lexical entry in (25) is an example of a *v-mod-word*.[10]

(25)
$$\begin{bmatrix} \textit{mod-verb} & \\ \text{I-FORM} & \textit{mek-un} \\ \text{HEAD} & \textit{verb}\begin{bmatrix}\text{MOD } \textit{nominal}\end{bmatrix} \\ \text{SUBJ} & \langle \boxed{1}\text{NP}[\textit{nom}] \rangle \\ \text{COMPS} & \langle \boxed{2}\text{NP}[\textit{acc}] \rangle \\ \text{ARG-S} & \langle \boxed{1}, \boxed{2} \rangle \\ \text{STEM} & \textit{mek-} \end{bmatrix}$$

4 Korean Relative Clauses

4.1 Locally Gapped Relative Clauses

Given this theoretical background, we can now provide a comprehensive analysis of Korean relative clauses, starting from canonical types.

[9] In addition to this static constraint on the word formation, there could be a lexical rule approach. Cf. Kim (1998).

[10] I-FORM here stands for inflectional form.

4.1.1 Relativization of an Argument

4.1.1.1 Non-subject Relatives

Korean relative clauses, one of whose distinctive properties is the absence of any relative pronoun, all belong to the type *relative-clause* which is in turn an instance of the type *adnominal-clause*.[11] From this type, the *rel-clause* inherits the constraint that its verb from should have a modifier value. In addition, this type is subject to the constraint in (26).

(26)
$$
\textit{rel-cl} \Rightarrow \begin{bmatrix} \text{HEAD} & \textit{verb}\begin{bmatrix}\text{MOD } \textit{nominal}_{\boxed{1}}\end{bmatrix} \\ \text{SLASH} & \{\ \ \} \\ \text{HD-DTR} & \begin{bmatrix}\text{SLASH } \{\text{XP}_{\boxed{1}}\}\end{bmatrix} \end{bmatrix}
$$

The constraint in (27) requires that a relative clause modify a nominal element coindexed with the referential parameter of the SLASH value in the head-daughter (cf. Sag 1997 for English relatives). Korean relative clauses are thus treated in terms of coindexation between the referential parameter of the modified head noun and that of the slashed element. This analysis has several immediate effects.

First, by requiring the MOD value to be a nominal element, a relative clause can combine with N, N′, or NP:

(27)	John-i	ilk-un	chayk/say chayk/ku say chayk
	John-NOM	read-PN	book/new book/the new book
	‘book/new book/the new book that John read’		

The constraint in (26), ensuring that its SLASH value should be empty, further guarantees that all mod clause must ‘bind off’ the SLASH value of the head daughter, whose only member is an XP coindexed with the phrase’s MOD value. This constraint thus ensures that the slashed element be coindexed with the clausal head that the relative clause modifies, eventually blocking cases like the following:

(28)	*[[John-i	$\_\_{}_i$ ilk-ko	iss-nun]	haksayng-i_j]
	John-NOM	read-COMP	is-PN	student-NOM

Since the clausal head *haksayng* ‘student’ isn’t coindexed with the slashed element in the relative clause, this violates the constraint in (26).

The constraint also tells that the head daughter of a relative clause bears a nonempty SLASH value. This will ensure that the grammar does not generate completely saturated modifying clauses.

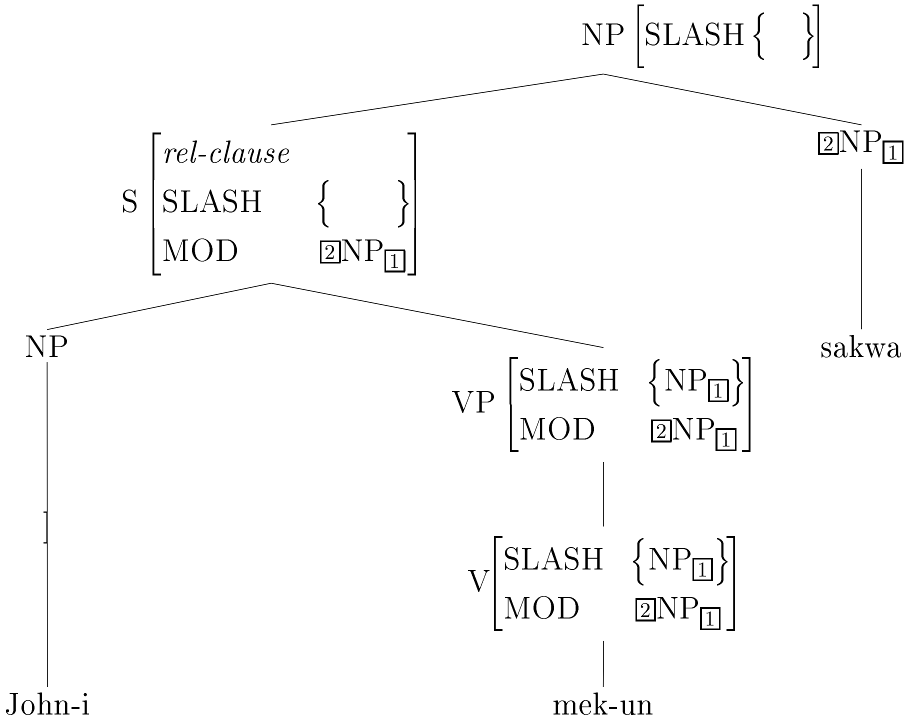
[11] There are two types of modifier or adnominal clause constructions, as argued in Kim (1998): head-relative-clause construction and head-sentential-complement construction.

(29) a. *haksayng-tul-i kapang-ey chayk-ul neh-un sangca
student-PL-NOM bag-LOC book-ACC put-PN box
'(intended) the box where the student put the book'

b. *haksayng-tul-i kapang-ey chayk-ul neh-un kongchayk
student-PL-NOM bag-LOC book-ACC put-PN notebook
'(intended) the notebook that the student put in the bag'

Let us consider an exemplar structure that satisfies all the relevant constraints:

(30)



The verb *mek-un* 'eat-PN' whose lexical entry is given in (31) bears the MOD specification. This head feature value is percolated up to the top node, S, by the Head Feature Principle.

(31) $$\begin{bmatrix} \textit{mod-verb} \\ \text{HEAD } \textit{verb}\begin{bmatrix}\text{MOD} & \boxed{2}\ \text{NP}_{\boxed{1}}\end{bmatrix} \\ \text{SUBJ} \quad \langle \boxed{1}\text{NP}[\textit{nom}] \rangle \\ \text{COMPS} \quad \langle\ \rangle \\ \text{ARG-S} \quad \left\langle \boxed{1}, \boxed{2}\begin{bmatrix} \textit{gap-ss} \\ \text{LOC } \boxed{3} \\ \text{SLASH } \left\{\boxed{3}\right\} \end{bmatrix} \right\rangle \\ \text{NONLOC} \mid \text{SLASH} \left\{\boxed{3}\right\} \end{bmatrix}$$

The verb also carries the SLASH feature amalgamated from one of its arguments according to the SLASH Amalgamation Constraint. This amalgamated SLASH value will pass up to the node, S, via the SLASH inheritance constraint. But this SLASH value whose index value is identical with that of the clausal head bound off at the S node by the constraint on the *rel-cl*. Each sub-structure of the tree in (30) satisfies all the constraints that the grammar requires for a well-formed structure to observe.

4.1.1.2 Subject Relatives

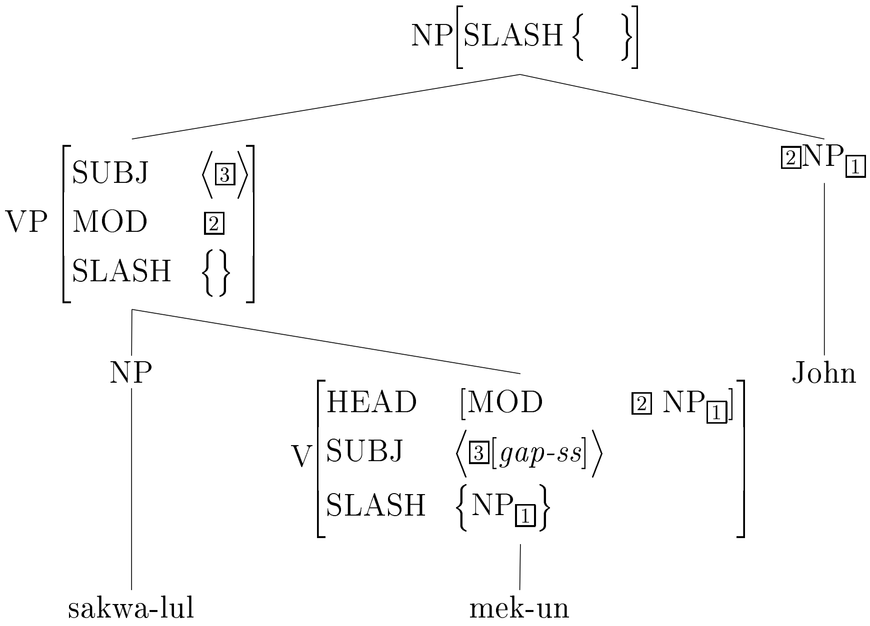
Note here that the analysis presented here covers subject extraction naturally too. We have noticed that verbs always have one element on their SUBJ list and that the SLASH values of a verb's arguments are amalgamated into its own SLASH value by the Amalgamation Constraint. Thus, the first member of a verb's ARG-ST is the same as the single member of its SUBJ. But there is no constraint blocking this SUBJ element from being of type *gap-ss*. For example, the lexemic information in (32)a could be realized as the *v-mod word* in (32)b.

(32) a. $$\begin{bmatrix} \textit{verb} \\ \text{ROOT} \quad \textit{mek-} \\ \text{HEAD} \quad \textit{verb} \\ \text{SUBJ} \quad \langle \boxed{1}\ \rangle \\ \text{COMPS} \quad \langle \boxed{2}\text{NP} \rangle \\ \text{ARG-S} \quad \left\langle \boxed{1}, \boxed{2} \right\rangle \end{bmatrix}$$

b. $$\begin{bmatrix} \textit{v-mod-word} \\ \text{I-FORM} \quad \textit{mek-un} \\ \text{HEAD} \quad \textit{verb}\begin{bmatrix}\text{MOD } \textit{nominal}\end{bmatrix} \\ \text{SUBJ} \quad \left\langle \boxed{1}\begin{bmatrix} \textit{gap-ss} \\ \text{LOC } \boxed{4} \\ \text{SLASH } \left\{\boxed{4}\right\} \end{bmatrix} \right\rangle \\ \text{COMPS} \quad \langle \boxed{2}\text{NP} \rangle \\ \text{ARG-S} \quad \left\langle \boxed{1}, \boxed{2} \right\rangle \\ \text{SLASH} \left\{\boxed{4}\right\} \end{bmatrix}$$

This lexical information in (32)b may project the structure like the following:

(33)



The only constraint we need to have is that the subject relative in Korean allows its subject not to be empty.[12]

(34)

$$\textit{subject-rel} \Rightarrow \begin{bmatrix} \text{HEAD } \textit{verb}\begin{bmatrix}\text{MOD } \begin{bmatrix}\text{INDEX } \boxed{1}\end{bmatrix}\end{bmatrix} \\ \text{SUBJ } \left\langle \begin{bmatrix}\text{INDEX } \boxed{1}\end{bmatrix} \right\rangle \end{bmatrix}$$

The constraint in (34) ensures that there is a coindexation relation between the unexpressed subject of the relative clause and its MOD value and hence is coindexed with the nominal phrase that the relative clause modifies. This tight relation will block sentences like (35)a where there could exist no coindexation relation between the putative gap in the relative clause and the clausal head. Further, since the subject needs to be unsaturated, the grammar would not generate sentences like (35)b.

(35) a. *[[__ $_i$ ku chayk-ul ilk-un] kulim$_j$]
that book-ACC read-PN picture

b. *[[emeni-ka ku chayk-ul ilk-un] haksayng]
mother-NOM the book-ACC read-PN student

[12]This constraint is similar to the one on the reduced relative clause in English. See Sag 1997.

Also, like canonical relative clauses, the constraint has no restriction on the type of the nominal that the subject relative clause modifies. This predicts that the subject relative can also modify an N, an N′, or an NP. When combined with canonical relatives, this also predicts that there is no word order restriction when the types of relatives co-occur.

(36) a. [John-i ilk-un [acwu pissa-n [(ku) chayk]]]
John-NOM read-PN very expensive-PN (that) book
'the book which is very expensive that John read'

b. [acwu pissa-n [[John-i ilk-un] chayk]]

4.1.2 Relativization of an Adjunct Element

One interesting property Korean has is that Korean rather freely allows an adjunct element to be relativized. In addition to arguments such as source or instrument as in (37), adverbial such as time, place, manner, degree, process, and reason can be relativized.

(37) a. John-i ton-ul kkenay-n cikap
John-NOM money-ACC pull.out-PN pocket
the pocket from which John pulled out money

b. John-i ppang-ul calu-n khal
John-NOM bread-ACC cut-PN knife
the knife with which John cut the cake

(38) a. ku haksayng-i yeki-eyse nolaylul pwulu-n sikan
'the time when the student sang a sang here'

b. ku haksayng-i ocen-ey nolaylul pwulu-n cangso
'the place where the student sang a song here'

To capture this flexibility of relativizing an adjunct element, we introduce the feature DEPENDENTS whose list value includes adjunct elements as well as the head's arguments. This treatment starts from the fact that like the behavior of case marking in Korean, certain adverbials are needed to be selected by means of the same mechanism which accounts for the selection of complements.[13]

[13] As an anonymous reviewer pointed out, this does not mean that all adverbials can be in the DEPS list. I leave this issue open for future research.

(39)
$$verb \Rightarrow \begin{bmatrix} \text{HEAD} & \boxed{3} \\ \text{ARG-ST} & \boxed{1} \\ \text{DEPS} & \boxed{1} \oplus \text{list}\left(\begin{bmatrix} \textit{adverbial} & \\ \text{MOD} & \begin{bmatrix} \text{HEAD } \boxed{3} \\ \text{CONT } \boxed{2} \end{bmatrix} \end{bmatrix}\right) \\ \text{CONT } \boxed{2} & \end{bmatrix}$$

The constraint tells two things. First, the verb itself can have any number of adverbials[14] in addition to its arguments in the DEPS list. Second, the semantics of this adverbial element is identified with that of the verb. This ensures that we get the semantics right. For example, the lexical entry *pwule-n* 'sing' can be extended to the verb containing an adverbial element in its DEPS list.

(40) Dependent Realization:
$$\begin{bmatrix} \textit{v-mod-word} & \\ \text{I-FORM} & \text{pwule-n} \\ \text{HEAD} & \textit{verb}\begin{bmatrix}\text{MOD } \textit{nominal}\end{bmatrix} \\ \text{SUBJ} & \langle \boxed{1}\text{NP}[\textit{nom}] \rangle \\ \text{COMPS} & \langle \boxed{2}\text{NP}, \boxed{4} \rangle \\ \text{DEPS} & \left\langle \boxed{1}, \boxed{2}, \boxed{4}\begin{bmatrix} \text{HEAD} & \textit{adv} \\ \text{CONT} & \boxed{3} \end{bmatrix} \right\rangle \\ \text{CONT} & \boxed{3} \end{bmatrix}$$

Once we posit this DEPS level with relevant constraints, the only thing we need to account for adjunct extraction is to refer to the DEPS level for the information of extracted elements, and to revise the Argument Realization Constraint into the Dependent Realization Constraint as in (41):

(41) Dependent Realization Constraint:
$$word \Rightarrow \begin{bmatrix} \text{SUBJ} & \boxed{1} \\ \text{COMPS} & \boxed{2} - \textit{list(gap-ss)} \\ \text{DEPS} & \boxed{1} \oplus \boxed{2} \end{bmatrix}$$

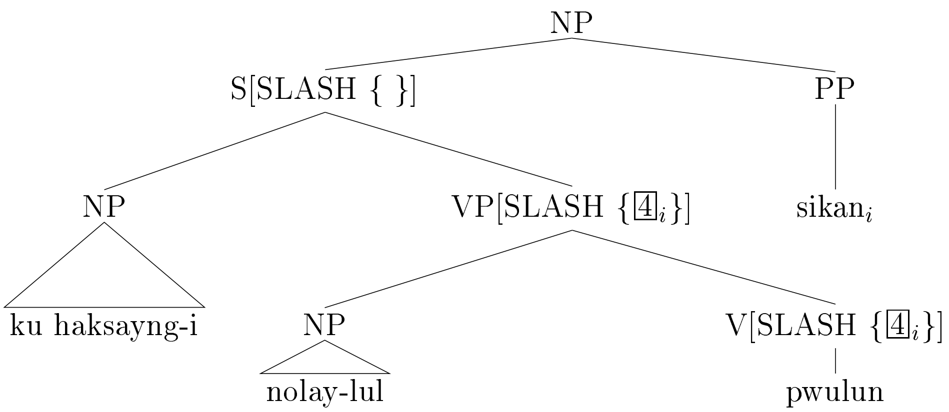
[14]Though the adverbial elements include adverbs and PPs, not all adverbials might be added. The possible class is subject to certain further constraints.

The only difference from the Argument Realization Constraint is that the level we need for extraction is the DEPS. The constraint thus now allows any element in DEPS to be realized as a *gap-ss*. For example, the following lexical entry for *pwule-n* 'sing' satisfies all these revised constraints:

(42)
$$\left[\begin{array}{l} \textit{mod-verb} \\ \text{I-FORM} \quad \textit{pwule-n} \\ \text{HEAD } \textit{verb}\begin{bmatrix}\text{MOD } \textit{nominal}\end{bmatrix} \\ \text{SUBJ} \quad \langle \boxed{1}\text{NP}[\textit{nom}]\rangle \\ \text{COMPS} \quad \langle\boxed{2}\text{NP}\rangle \\ \text{DEPS} \quad \left\langle \boxed{1}, \boxed{2}, \left[\begin{array}{l}\textit{gap-ss}\\ \text{LOC} \quad \boxed{4} \\ \text{SLASH} \left\{\boxed{4}\right\}\end{array}\right]\right\rangle \\ \text{SLASH} \left\{\boxed{4}\right\} \end{array}\right]$$

We obtain this lexical structure by assuming that (a) an adverbial is instantiated as a singleton list, (b) the Dependent Realization constraint has instantiated this element further as a gap, and (c) the SLASH value of the gap is incorporated into the SLASH value of the verb because of the SLASH amalgamation constraint. This lexical structure eventually generates the following structure for the phrase *ku haksayng-i nolay-lul pwulu-n sikan* 'the time when the student sang a song':

(43)



The system we have seen provides a uniform account for both complement and adjunct extraction. Such a treatment can be supported by the fact that a) adjuncts also allow unbounded dependencies b) dislocated adjuncts involve true extraction (cf. Hukari and Levine 1995).

4.1.3 Interface with Semantics of RCs

A traditional idea of interpreting a canonical relative clauses is that the relative clause characterizes the head noun. For example, the relative clause in (44)a is interpreted as in (44)b.

(44) a. Mary-lul salangha-nun namca
Mary-ACC love-PN man
'man that loves Mary'

b. $\lambda x[\ \text{men}'(x)\ \&\ \text{love}'(x,\text{m})]$

The interpretation in (44) means that the denotation of the phrase with the relative clause and the head noun it modifies is the interaction of the set of properties possessed by the head noun *man* and the property of the relative clause, that is, the property of loving Mary. Such an analysis amounts to the one assuming the canonical relative clause restricts the properties of the head noun. When we represent this in terms of the constraint in the type of *head-adjunct-ph* with a relative clause and the head noun that the clause modifies, it will look like the following:

(45)

$$\textit{head-rel-ph} \quad \Rightarrow \quad \begin{bmatrix} \text{HEAD} & \textit{noun} \\ \text{CONT} & \begin{bmatrix} \text{INDEX} & \boxed{3} \\ \text{RESTR} & \boxed{4} \uplus \boxed{5} \end{bmatrix} \\ \text{HD-DTR} & \begin{bmatrix} \text{INDEX} & \boxed{3} \\ \text{RESTR} & \boxed{5} \end{bmatrix} \\ \text{NON-HD-DTRS} & \langle\ \text{CONT} \quad \boxed{4}\textit{proposition} \rangle \end{bmatrix}$$

The constraint requires that the CONTENT value of a *hd-rel-ph* is a restricted index whose restriction set is constructed by adding the relative clauses' propositional content into the restriction set of the head daughter. With this constraint in hand, the CONTENT of the relative clause like *John-i ilk-un chayk* 'the book that John read' will have the following feature structure.

(46)

$$\text{NP}\begin{bmatrix} \textit{head-rel-ph} \\ \text{INDEX} & \boxed{3} \\ \text{RESTR} & \left\{\boxed{4}, \boxed{5}\right\} \end{bmatrix}$$

$$\text{S}\begin{bmatrix} \text{CONT}\ \boxed{4}\begin{bmatrix} \text{RELN} & \textit{read} \\ \text{AGENT} & \boxed{1} \\ \text{PATIENT} & \boxed{2} \end{bmatrix} \end{bmatrix} \qquad \text{NP}\begin{bmatrix} \text{INDEX} & \boxed{3} \\ \text{RESTR} & \boxed{5}\left\{\begin{bmatrix} \text{RELN} & \textit{book} \\ \text{INSTANCE} & \boxed{3} \end{bmatrix}\right\} \end{bmatrix}$$

John-i ilk-un　　　　　　　　chayk

Here $\boxed{3}$ indicates the index associated with *book* and $\boxed{1}$ with the person(i.e., John) who read this $\boxed{2}$. Informally this feature structure tells that there is a book, x, such that John reads. If there isn't any book that John read, it will be semantically odd. This entails that the grammar includes the following simple index constraint:[15]

(47) Restrictiveness Constraint:
The index value of the clausal head should be identifiable.

This in turn means that the two elements in the restriction set of the clausal NP should have a common member at least that satisfies both of the elements. Thus if the set elements denote 'John read x' and 'there is a book, y', then this does not satisfy the constraint.

This semantically formalized constraint explains why examples like (48) are unacceptable in a normal context (data from Na and Huck 1993):

(48) a. # [John-i manna-n] yenphil
John-NOM meet-PN pencil
'(lit.) the pencil that John met'

b. # [nol-i yeyppun] yenphil
dawn pretty pencil
'(lit.) pencil whose dawn is pretty'

In a usual world, there cannot be a pencil such that John could meet. But in a fairly tale in which the pencil is humanized, it isn't strange for the little John to meet the pencil. If a

[15]This constraint is similar to Kuno's aboutness condition or Na and Huck's (1993) Characterization Condition stating that "A restrictive relative clause distinguishes a proper subset of the set denoted by the clause head."

clause violates this, we will have an anomalous sentence. Our grammar thus generates cases whose acceptability is context dependent (cf. Na and Huck 1993)[16]

Our constraint-based system where syntax and semantics are interwoven together thus can account for the acceptability of various relative clauses without recourse to unformalized constraints such as the 'aboutness' or the 'characterization' condition.

4.1.4 One Additional Type of Local Relative: Genitive Relatives

As in other topic prominent languages such as Japanese and Turkish, Korean allows relative clause constructions whose subject is genitive case marked.

(49) a. ku sinsa-uy ip-un os
the gentleman-GEN wear-PN clothes
'the clothes that the gentleman wears'

b. John-uy pwuleci-n son
John-GEN broken-PN hand
(lit.)'John's broken hand'

There exist several restrictions to such genitive relatives. As noted in Yoon (1991), the head nouns of the relative clauses cannot have specifiers:

(50) a. *ku sinsa-uy ip-un sensayngnim-uy/ku/ce os
the gentleman-GEN wear-PN teacher-GEN/the/that clothes

b. *John-uy pwuleci-n *sensayngnim-uy/ku/ce son
John-GEN broken-PN teacher-GEN/the/that hand

Further, the genitive case marked NP should be either generic or definite.

(51) a. *nwukwu-uy ip-un os
who-GEN wear-PN clothes

b. *han salam-uy ip-un os
one man-GEN wear-PN clothes

Common relative clauses observe no such restrictions.

(52) a. John-i ilk-un sensayngnim-uy chayk
John-NOM read-PN teacher-GEN book
'the teacher's book that John read'

[16] According to Na and Huck (1993), the oddness of (48)b is due to the fact that *nol* 'dawn' cannot be used to refer to an entity *thematically subordinate* to the entity referred to by *yenphil*. See the next section.

b. han salam-i ip-un yangpok
one man-NOM wear-PN suit
'the suit that one man wears'

These properties imply that the so-called genitive relative clause has the constraint such as (53).

(53)

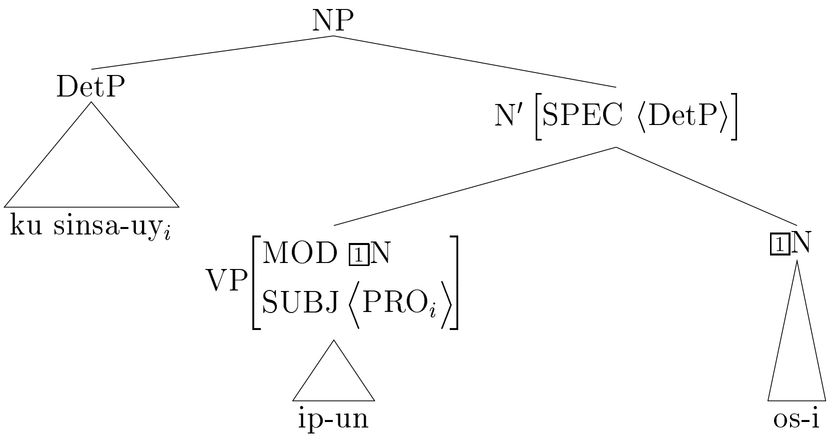
$$genitive\text{-}rel\text{-}clause \Rightarrow \begin{bmatrix} \text{HEAD} & verb\begin{bmatrix}\text{MOD} & \begin{bmatrix}\text{N}' \begin{bmatrix}\text{SPEC } \langle \text{DetP}_i \rangle\end{bmatrix}\end{bmatrix}\end{bmatrix} \\ \text{SUBJ} \left\langle \text{X}_i \right\rangle & \\ \text{HD-DTR} \,|\, \text{SLASH} & \{ \quad \} \end{bmatrix}$$

The constraint says that a genitive relative clause will modify a nominal phrase (N′) whose specifier is unsaturated. This will prevent us from generating sentences like (50). The constraint in (53) further requires that the relative clause still seeks its subject, making it a VP phrase. Thus we will not allow a completely saturated genitive relative clause.[17]

(54) *ku sinsa-uy [Mary-ka ip-un] os
the gentleman-GEN Mary-NOM ear-PN clothes
'(lit) the gentleman's clothes that Mary wears.'

Given this constraint, we may have the structure of a genitive clauses as follow:[18]

(55)



[17]One additional constraint we need is that this unsaturated DP has such a semantic constraint that it should be generic or definite. This will block us from generating cases like (51).

[18]The object *PRO* here is a subtype of *synsem*, distinct from *canonical* and *gap*. This element isn't thus an empty element. See Sag (1997).

The constraint in (54) further prevents us from generating sentences like (51) where the nominal phrase that the relative clause modifies is fully saturated. They are unacceptable simply because they violate the requirement that the head noun of genitive relative clauses be an unsaturated noun phrase, unlike normal relative clauses whose head can be either saturated or unsaturated.

One desirable consequence this analysis brings us is a word order pattern between a canonical relative and a genitive relative.

(56) a. [[Mary-ka po-n] [[John-uy ip-un] os]]
Mary-NOM see-PN John-GEN wear-PN cloth
'the clothes that John wears that Mary saw'

b. *[[John-uy ip-un] [[Mary-ka pon] os]]
John-GEN wear-PN Mary-NOM see-PN cloth

The system I have proposed so far makes sure that a canonical relative can combine with any nominal element to modify it, whereas a genitive relative needs to combine with an N or N′ first. This explains the contrast in (56).

Here let us discuss the relationship between the types of head noun and of predicates. Na and Huck (1993) claim that the acceptability of relative clauses depends on the relationship between the head and a nominal in the relative clause. The following is the condition that they assume to be crucial in generating Korean relatives:

(57) The Argument Condition (Na and Huck 1993:200)
A relative clause must contain an element E that the clause predicates something of, where E is either

A. a gap coindexed with the clause head; or
B. a nominal whose denotation is thematically subordinate to that of the clause head

According to this constraint, the relationship between a nominal within the relative clause and the clause head plays a crucial role in allowing Korean relatives.[19]

If we try out to incorporate their analysis into genitive RC's, we encounter an immediate problem: the acceptability of genitive relative clauses depends on the relationship between the properties of the head noun and those of the clausal verb, not between the head noun and a nominal element in the relative clause:

[19](X is *thematically subordinate* to an entity Y iff Y's having the properties it does entails that X has the properties it does). Na and Huck (1993) classify this thematical subordination relation into five: *part-whole* (cover vs. book, voice vs. man, tail vs. dog), *quality-to-entity* (use vs. tool, color vs. eyes, taste vs. food), *conventional* (car vs. man, dog vs. girl, hat vs. boy, nest vs. bird), *hierarchical* (parent vs. child, doctor vs. patient), and *taxonomic* (apple vs. fruit, chair vs. furniture, shirt vs. clothes, soccer vs. game) relation. These classifications are the central part of their analysis.

(58) a. *John-uy po-n os
John-GEN see-PN cloth
'(intended) the clothes that John saw'

b. John-uy ip-un os
John-GEN wear-PN cloth
'(intended) the clothes that John wears'

(59) a. *John-uy manna-n chinkwu
John-GEN meet-PN friend
'(intended) the friend that John met'

b. John-uy salangha-nun chinkwu
John-GEN love-PN friend
'the friend that John loves'

If the relationship between a nominal within the relative clause and the clausal head it modifies determines the grammaticality of relative clauses, there shouldn't be any grammatical difference between (58)a and (58)b.[20]

The contrast in (58) and (59) comes from the types of the predicate in the relative clause. Further matters become more complicated by the fact that the presence of adverbial elements or present aspect elements can improve their grammaticality:

(60) a. John-uy paykhwacem-eyse po-n os
John-GEN department-LOC see-PN clothes
'the clothes that John saw in the department store'

b. John-uy hyonchay manna-ko iss-nun chinkwu
John-GEN present meet-COMP is-PN friend
'the friend that John is meeting now'

The examples in (60) again show that it is not the relation between a nominal element and the clause but the relation between the predicate of the relative clause and its head noun that determines the grammaticality of a genitive relative clause. As argued by Yoon (1993) and others, the constraint in work in genitive RC's would be such that the clause modifying head noun should be in a conceptual or physical close relationship, that is, they need to be 'inalienable' to each other.

Adopting this observation, we could add the following restriction on the genitive relative clause constructions[21]

[20] Na and Huck's Characterization Condition will not do since it is possible for the relative clause *John's seeing x* to distinguish a proper subset of the set denoted by the clausal head *clothes*.

[21] More clearly, we could take the constraint on 'inalienable' to be pragmatics. If we follow this track, we many need to place this constraint in CONTEXT value in feature structures. See Chung 1993.

(61)

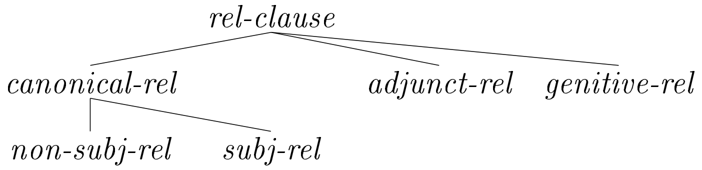
$$
\textit{genitive-rel-cx} \quad \Rightarrow \quad \left[\begin{array}{l}
\text{CONT} \left[\text{RESTR } \boxed{3} \uplus \boxed{4} \uplus \boxed{5} \left[\begin{array}{l} \text{RELN } \textit{inalienable} \\ \text{ARG1 } \boxed{3} \\ \text{ARG2 } \boxed{4} \end{array}\right] \right] \\
\text{HD-DTR} \mid \text{RESTR } \boxed{3} \\
\text{NON-HD-DTR} \mid \text{RESTR } \boxed{4}
\end{array}\right]
$$

The 'inalienable' constraint isn't the relationship between a nominal within a relative clause and the clausal head it modifies. It is the relationship between the semantic restriction of the clausal head and that of the genitive relative clause.

4.1.5 Summary

The types of Korean relative clause discussed in this section are summarized in (62).

(62)



Each type inherits constraints from its supertypes and further has its own constraints. Though the types of Korean relative appear to be complex, their properties can be cross-classified thru this simple multiple hierarchy. We will see in what follows that all the cases of relativization that seem to violate the syntactic constraint all belong to this hierarchy.

4.2 Non-Local Relativization

In general, Korean also appears to be subject to the island constraint or (CNPC: Complex Noun Phrase Constraint):

(63) a. *[[e_j pangchi-ka] i sathay-lul cholayha-n] $pyeng_j$
negligence-NOM this state caused illness
'(intended) illness such that negligence caused this condition'

b. *[[e_j e_i ilk-ko iss-nun] ai_j-ka pappu-n] $chayk_i$
read-COMP is-PN child-NOM busy-PN book
'(lit.) the book which the child who is reading is busy

The ungrmmaticality of these follows from the constraint that all noun words, unlike verbs, do not allow nonempty SLASH value. Thus, the constraint in (64) will make sure that an NP will not have a SLASH value.

(64) $\begin{bmatrix} \textit{noun-word} \\ \text{SLASH}\{\quad\} \end{bmatrix}$

But there are cases that appear to violate the CNPC. There are three main types of relative clause that include the putative gap not subjacent to its antecedent. In what follows, I show all these cases are not really violations of the syntactic island constraints. Instead, they are all local relativization cases obeying the island constraints such as the CNPC.

4.2.1 Relativization from an embedded sentential complement clause

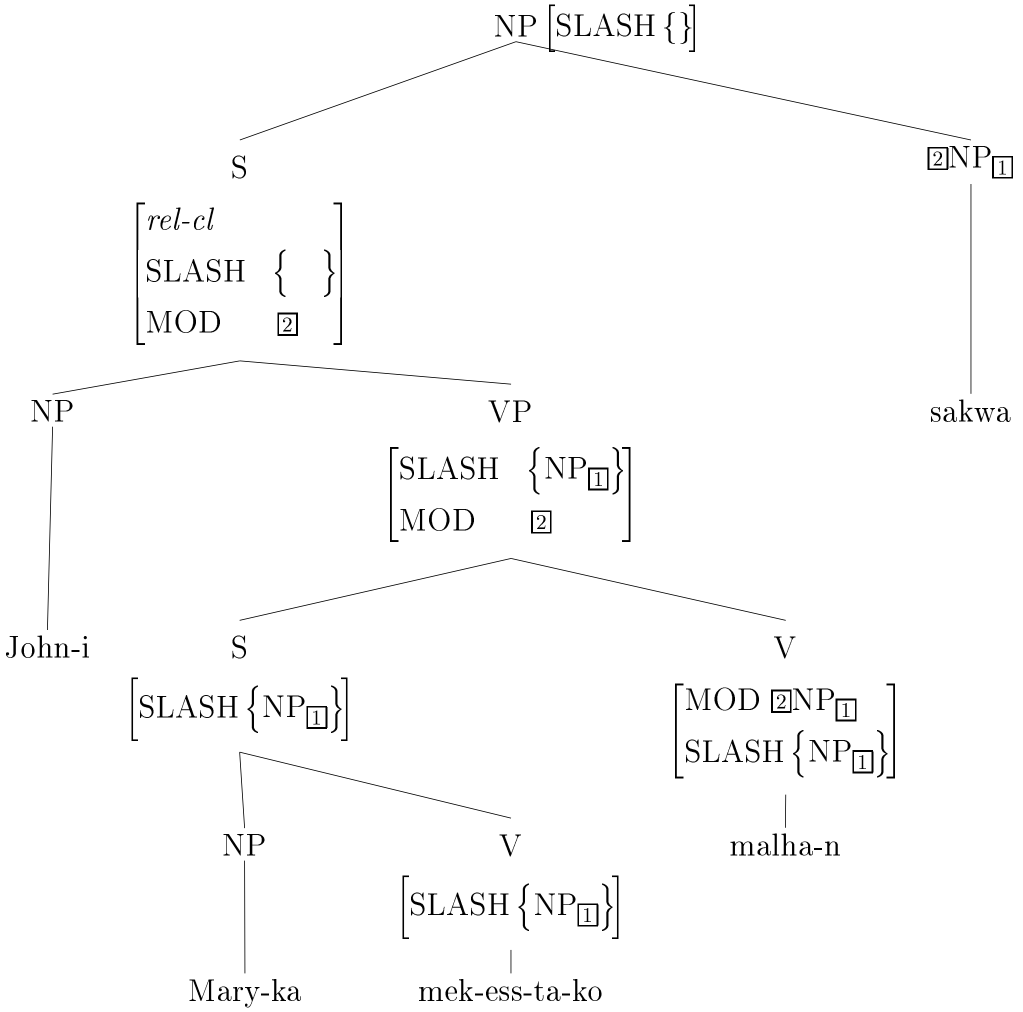
The first seemingly nonlocal type we can observe is cases where an element from the embedded sentential complement is relativized.

(65) a. John-i [Mary-ka $\_\__i$ mekessta-ko] malha-n sakwa$_i$
John-NOM Mary-NOM ate-COMP say-PN apple
'the apple that John said Mary ate yesterday'

b. John-i [Mary-ka $\_\__i$ ilkessta-ko] mit-nun chayk$_i$
John-NOM Mary-NOM read-COMP believe-PN book
'the book that John believes Mary read'

The analysis presented so far provides a direct account for such cases. For example, (65)a will roughly have the following structure in our system.

(66)



The words *mek-ess-ta-ko* 'eat-PAST-DECL-COMP' can have the feature structure in which their COMPS value is empty thus the second element of their ARG-ST is realized as a gap. This verb amalgamates its nonempty SLASH value, which is passed up to the embedded clause S. The highest verb that selects this S as its complement again amalgamate this SLASH value into its own SLASH value in accordance with the SLASH Amalgamation Constraint. The SLASH Inheritance Constraint will make sure that the VP inherits this SLASH value.

Let us now compare our analysis with Na and Huck's (1993): In their analysis, the gap should be an argument of the main predicate to satisfy the A condition of the AC (Argument Condition). To do so, Na and Huck (1993: 214-217) provides an analysis in which assertive predicates are taken to be sentential modifiers, thus not counted as 'clause predicates'. One argument they provide for the modifier treatment is based on the assumption that "the more material that is carried by the upper clause in the relative, the more difficult it becomes to interpret that clause as an adverbial modifer." They claim this explains the unacceptability of sentences like (67) (Data from Na and Huck (1993)):

(67) a. *??[[Seyho-ka [e] ilkun] kes-ulo sip-nyen-cen-ey chwucengtoyn] capci
'the magazine which that Seyho read [it] was surmized 10 years ago.'

b. ??[Seyho-ka e ilk-nun] kes-ulo Marie-uy tongsayng-ey uyhayse chwucengtoyn capci
'the magazine which that Seyho read [it] was surmized by Mary's sister'

They claim that this 'modifier' (those parts including the assertive predicate) should be simple enough for a semantic reason. However, notice that the amount of the upper clause does not determine the grammaticality but is context-sensitive:

(68) a. [Pwukhan-i [e] kaypalhan] kes-ulo mikwuk-i cwucangha-n haykmwuki
'the nuclear weapon that America claimed North Korean have developed'

b. [ku-ka [e] patun] kes-ulo kyongchal-i chwucengha-nun noymwul
'the bribe that the police claimed he has received

As far as we can see, there is no difference between (67) and (68) in the amount of the material in the upper clause in their sense. The ungrammaticality of (67) seems to rely on the type of the elements intervening between the sentential complement and the clausal head. When we have the active form of verbs instead of the passive forms, their grammaticality increases:

(69) a. [Seyho-ka [e] ilkun] kes-ulo salamtul-i chwucengha-nun] capci
'the magazine such that people assume that Seyho read it'

b. [Seyho-ka [e] ilk-nun] kes-ulo Marie-uy tongsayng-i chwucengha-nun capci
'the magazine such that Marie's sister surmises Seyho read [it].'

Without claiming that assertive predicates act like modifiers, our analysis, different from Na and Huck's, allows the relativization of an argument from an embedded sentential complement unless otherwise blocked.

4.2.2 Relativization from a relative clause

A more complicated type is cases where the gap with which the clausal head is coindexed is within a relative clause (Data from Na and Huck 1993):

(70) a. [[$\_\__i$ $\_\__j$ ipko iss-nun] os$_j$-i] mesci-n sinsa$_i$
wearing is-PN clothes-NOM stylish-PN gentleman
' (lit.) man$_i$ who the clothes that [e$_i$] is wearing are stylish'

b. [[__ $_i$ __ $_j$ ssu-n] sosel-i inki-ka iss-nun] cakka]
write-PN novel-NOM fame-ACC attract-PN writer
'writer$_i$ who the novel that e$_i$ wrote was popular

Na and Huck's account for such cases follows from their condition B of the AC: The denotation of *os* 'clothes' is thematically subordinate to the denotation of *namca* 'man'. In the same spirit, *sosel* denotes an entity thematically subordinate to that denoted by *cakka* 'writer'. Their explanation hinges on whether the head nominal of the uppermost relative is in the 'thematic subordination', in particular, 'conventional relation' with the head nominal of the lower relative. But one immediate question follows from cases like the following:

(71) a. [[__ $_i$ __ $_j$ ticainha-n] phyoci-ka$_j$] tangsentoy-n haksayng$_i$
design-PN cover-NOM selected-PN student
'(lit.) the student$_i$ who the cover that e$_i$ designed was selected'

b. *John-i [[__ $_i$ __ $_j$ ssu-n] sosel-ul Mary-eykey cwu-n] cakka]
John-NOM write-PAST-DECL-PN novel-ACC Mary-DAT gave-PN writer
'writer$_i$ who the novel that e$_i$ wrote John gave to Mary '

There seems to exist no 'conventional relation' between cover and student (unlike between cover and book as Na and Huck's part-whole relation), but (71)a is acceptable. In contrast, there is a thematic subordination between *sosel* and *cakka*, but it is ungrammatical. This clearly indicates it is not just the relationship between the two nominals (the head noun of the relative clause and a nominal within it) that determines the grammaticality of such cases but we need to look the whole clause together.

The analysis I adopt here is the one where such cases are all 'closely' related to double nominative constructions, as shown by Na and Huck (1993). But my analysis is basically different from theirs, in that unlike their thematic subordination analysis, I claim that such cases are not the relativization of the subject of the embedded relative clause, but the relativization of the subject of a multiple nominative sentence. Let us see what I mean by this.

When we look into the data that allow relativization from a relative clause, we can notice that the highest verb is the one that allows a multiple nominative NP construction. For example, the verbs of the highest relative clause in (70) all allow the following sentences:

(72) a. ku sinsa-ka os-i **mesci-ta**
he man-NOM hand-NOM big-DECL
'The man's hand is big'

b. ku cakka-ka sosel-i **inki-ka iss-ta**]
the dog-NOM tail-NOM long-DECL
'The dog's tail is long'.

In (72)a, the predication involving the second NP and the verb is in turn predicating the first NP. This implies that there should be a certain plausible relation between the two NP's. In Na and Huck's sense, there should be a thematic subordination relation between the two NP's. If not, we would have unacceptable cases like (73):

(73) a. *misul-i os-i mesci-ta
art-NOM clothes-NOM nice

b. *ku kay-ka phyoci-ka kil-ta
the dog-NOM cover-NOM long-DECL

Now let us see more unacceptable 'bicomplex' cases where the clausal head is relativized from the lower relative clause.

(74) a. *[[tulkoiss-nun] ai-ka pappu-n] wusan
holding-PN child-NOM busy-PN umbrella

b. *[[ilkessta-nun] chayk-i pissa-n] yeca
read-PN book-NOM expensive-PN woman

c. *[[ilepeli-n] chayk-i simoha-n] Mary
lost-PN book-NOM delicate-PN Mary

d. *ponaycwu-n salam-i Pwusan-e iss-nun senmwul
sent-PN person-NOM Pwusan-LOC is-PN gift

What is interesting is that every predicate of the top relative clause here does not allow multiple nominative constructions.

(75) a. *ku wusan-i ai-ka pappu-ta

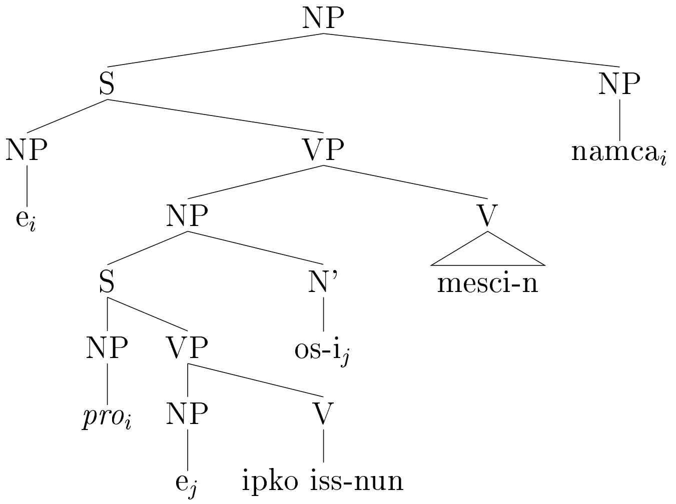
b. *ku yeca-ka chayk-i pissa-ta

c. *Mary-ka chayk-i simoha-ta

d. *senmwul-i salam-i Pwusan-ey iss-ta

As noted by Hasegawa (1981, 1984) for Japanese, the relativized phrase in Korean also needs to be the subject of the lower relative and the head of the complex NP containing it serves as the subject of the higher clause. This is also the starting point of Na and Huck's analysis. But the proposed analysis walks on a different track: it claims that the top relativized phrase is the subject of the highest relative clause, not that of the lower relative clause. This claim will generate the following traditional structure with a gap:

(76)



A major difference from the previous analyses (including Na and Huck's) is that the subject of the lower relative clause is a *pro* element coindexed with the subject of the highest verb which is in turn coindexed with the relative clausal head. One piece of evidence for assuming *pro* here could come from the possibility of having an overt reflexive pronominal-type nominal *caki* 'self' or *ku* 'he' as in (77)a. We further can have a plain declarative sentence where this position is filled with such an overt pronominal.

(77) a. caki-ka/ku-ka ip-ko-iss-nun os-i mesci-n namca

b. ?ku namca-ka [[caki-ka ip-ko-iss-nun] os-i] mescita.

One obvious constraint that exists here is the coindexation relation between this *pro* and the relative clausal head. There could be no context violating this conindexation relation. This constraint is what we expect from semantic constraints on the multiple nominative constructions. As noted earlier, there should be a certain conventional relation between the two NP's in multiple nominative constructions. This relation is so strict that no expression that modifies the second NP can change this 'conventional' or 'thematic subordination' relation. If this changing process happens, we could no longer hold the conventional relation between the two, eventually generating a semantically anomalous sentence.

My analysis presented here naturally predicts subject and object asymmetry:

(78) a. ip-un yangpok-i tele-wun sinsa
wear-PN suit-NOM dirty-PN gentleman

b. cohaha-nun kay-ka cwuk-un ai
like-PN dog-NOM die-PN child

(79) a. *[__ $_i$ __ $_j$ip-un] yangpok-ul$_j$ nay-ka po-n sinsa$_i$
wear-PN suit-ACC I-NOM see-PN gentleman

b. *[__ $_i$ __ $_j$ cohaha-nun] kay-lul$_j$ John-i kacyeka-n ai$_i$
like-PN dog-ACC John-NOM take.away-PN child

Examples (79) are all simply unacceptable because they violate the CNPC constraint. This in turn means the highest predicate does not take multiple nominative NP's.

Further tests with more acceptable bicomplex constructions (data are from Na and Huck with slight revisions) support our claim that these types are the relativization of the first nominative NP of the multiple nominative constructions. As the data in the below proves, all the bicomplex constructions cases have counterpart multiple nominative constructions:

(80) a. sal-ko-iss-nun aphatu-ka acwu khu-n chinkwu
live-COMP-is-PN apartment-NOM very big-PN friend
'the friend whose apartment he is living is very big'

b. chinkwu-ka aphatu-ka acwu khuta

(81) a. pom-hakki-ey kaluchi-l salam-i kyelcengtoy-n kwamok
spring-term-in teach-PN person determiend-PN course
'the course such that the person who will teach [it] in spring term has been decided'

b. ku kwamok-i salam-i kyelchengtoy-ess-ta

(82) a. tochakha-n kos-i tosi kunche-i-n yehangkayk
arrive-PN place-NOM city near-COP-PN traveller
'the traveller such that the place [s/he] will arrive is near a city'

b. yehangkayk-i tochakhan-kos-i tosi-i ta

(83) a. ilha-nun cikwon-i motwu sikol cwulsin-in hoysa
work-PN employee-NOM all country origin-PN company
'the company such that the employee who work [for it] are all from the country'

b. ku hoysa-ka cikwon-i motu sikol cwulsin-i-ta

(84) a. chinha-n chinkwu-ka manh-un sonye
close-PN friend many girl
'girl who has many close friends'

b. ku sonye-ka chinkwu-ka manhta

(85) a. pangmwunha-l kacok-i iss-nun salam
visit-PN family-NOM exist-PN person
'person who has a family to visit'

b. ku salam-i kacok-i iss-ta

The advantages of our analysis are clearer when compared with Na and Huck's analysis. For example, their analysis requires an undesirable morphological derivation to account for data like (81) and (82). We see that there is no subordinate (or transparent) relation between *salam* 'person' and *kwamok* 'course' or between *cangso* 'place' and *yehayngkayk* 'traveller'. Their wayout is to claim that there exists a noun compound such as 'pomhakki-kangsa' which allows a relativization like the following (Na and Huck 1993:210):

(86) pom-hakki-kangsa-ka kyelcengtoy-n kwamok
spring-term-instructor-NOM determined-PN course

What they claim is that a productive morphological process turns this compound *pomhakki-kangsa* into *pomhakki-ey kaluchi-l salam*. It is doubtful how a morphological process can turn a compound into such a sentential level element.

A further ad hoc mechanism they accept is to account for data like (84). Here again there is no subordinate relation between *chinkwu* 'friend' and *sonye* 'boy'. Their escape hatch is to adopt the level of FI with the following representation:

(87) $[_S$ e$_i$ $[_{NP}$ $[_S$ e$_i$ e$_j$ a-nun] salam$_j$-i] manh-un] sonye$_i$

In their analysis, the head noun in the embedded clause is first topicalized first and became the argument of the relative clause predicate *manh-* 'many' (no longer the argument of *a-nun* 'know'. Thus this satisfies the A-clause of their Argument Condition. But the question remains on the applicable domain of this syntactic process. We cannot apply this rule to every case.

Note that our analysis requires neither a powerful morphological process that can look into syntax nor an escape hatch that allows an additional syntactic process to avoid the subjacency violation. Ours is simply that the highest subject of the multiple nominative constructions is relativized.

4.2.3 Relativization from an adverbial clause:

A next type that seems to violate the CNPC condition is a relativization from a modifier clause.[22]

[22]But not all modifier clauses allow the relativization. This type is also subject to further constraints.

(88) a. [sensayngnim-i __ $_i$ ilkessul ttay] motwun haksayng-tul-i wuless-ten pyonci$_i$

sensayngnim-i __ $_i$	ilkessul	ttay	motwun	haksayng-tul-i	wuless-ten	pyonci$_i$
teacher-NOM	read	when	all	student-PL-NOM	cry-PN	letter

‘the letter$_i$ which all students cried when the teacher read __ $_i$’

b. [__ $_i$ cwuke-se] motwu-ka selphuha-nun salam$_i$

__ $_i$ cwuke-se	motwu-ka	selphuha-nun	salam$_i$
dead-since	all-NOM	sad-PN	person

‘(lit.) the person$_i$ who everyone cried because __ $_i$ died’

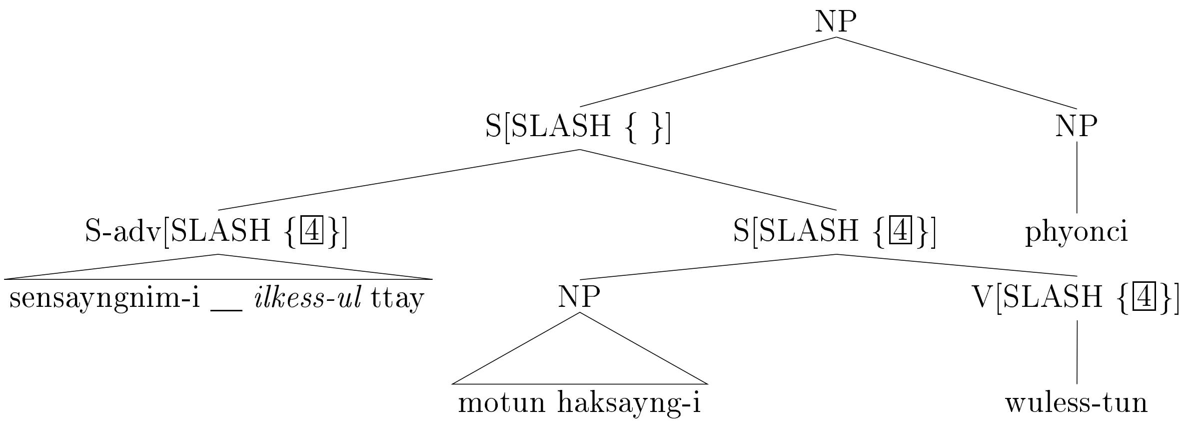
An answer for this phenomenon comes easily, once we accept the present analysis where COMPS may contain an adverbial *synsem*. For example, in the present analysis, the word *wuless-ten* can have the following lexical entry where an adverbial clause is realized as its complement in the DEPS list:

(89)
$$\begin{bmatrix} \textit{v-mod-word} & \\ \text{I-FORM} & \textit{wuless-ten} \\ \text{HEAD verb}\begin{bmatrix}\text{MOD } \textit{nominal}\end{bmatrix} & \\ \text{SUBJ} & \langle \boxed{1}\text{NP}[\textit{nom}]\rangle \\ \text{COMPS} & \langle \boxed{2} \rangle \\ \text{DEPS} & \left\langle \boxed{1}\text{NP}, \boxed{2}\begin{bmatrix}\text{HEAD} & \textit{adv} \\ \text{CONT} & \boxed{3}\end{bmatrix}\right\rangle \\ \text{CONT} & \boxed{3} \end{bmatrix}$$

Once we allow a sentential adverbial clause to serve as the complement of a certain verb as in (89), we will have a structure similar to the one with an assertive predicate selecting a sentential complement. This in turn means that the relativization from an adverbial clause is not different from that from a sentential complement clause. There is no difference in that the relativized element is in the sentential complement selected by the highest verb.

Given this, (88)a will have the following syntactic structure:

(90)



The verb *ilkessul* allows its object complement to be realized as a gap as shown in (91):

(91)
$$\begin{bmatrix} \textit{v-mod-word} & \\ \text{I-FORM} & \textit{ilkessul} \\ \text{SUBJ} & \langle \boxed{1}\text{NP}[\textit{nom}] \rangle \\ \text{COMPS} & \langle \quad \rangle \\ \text{DEPS} & \left\langle \text{c}, \boxed{2}\begin{bmatrix} \textit{gap-ss} \\ \text{LOC } \boxed{4} \\ \text{SLASH } \left\{ \boxed{4} \right\} \end{bmatrix} \right\rangle \\ \text{SLASH } \left\{ \boxed{4} \right\} & \end{bmatrix}$$

This slash value will be be amalgamated to its lexical head and percolated up to the adverbial sentence. The key point here is that this sentential adverbial is now selected by the highest mod predicate *wuless-tun*, thus allowing the verb to amalgamate the SLASH value as its lexical information. Further this SLASH value's index value is identical with that of the clausal head *phyonci*, satisfying the general constraint on the relative clause. No constraint is thus violated.[23]

4.2.4 Summary

When we look back on the three main types that seem to be the relativization of an element from long distance are not really nonlocal relativization but are local relativization. This tells that we need to posit no further subconstructions for Korean relative clauses, eventually making the grammar simple.

5 Conclusions

Korean relative clauses have given us many puzzles with their highly flexible behavior. But once we pin down cross-classifying generalizations on each sub-type of relative clauses and its idiosyncrasies, the directions of the puzzles could be found. In doing so, the analysis, adopting the theory of Sag (1997) for English relatives has provided a traceless analysis

[23] Another analysis is also possible where the relative head is the modifier of the main relative clause. Thus the source sentence would be something like the following:

(i) [sensayngnim-i *pro* ilkessul ttay] motwun haksayng-tul-i ku phyonci-ttaymwu-ey wuless-ta
teacher-NOM read when all student-PL-NOM that-letter-because cried
'When the teacher read (something other than the letter), all the studies cried because of the letter'

For such an analysis, see Park and Kim (1998).

that make the best use of 'head' and 'constraints'. In the analysis, it is the very lexical head that bears information about extracted constituents and further that makes this information propagate up until it is terminated. Further the constraints defined on relevant grammatical constructions further provide cross-classifying generalizations on Korean relatives and further idiosyncratic properties of their sub-relative constructions.

At a glance, we seem to have two types of Korean relatives; island constraint-conserving and island violating relatives. But once we made a clean analysis for canonical relatives and extend this to incorporate all the allegedly non-local relativization, we see that they all belong to regular local relatives. This unified system has eventually led us to the conclusion that Korean flexible relative clauses also observe the basic syntactic constraints such as the subjacency or island constraints.

References

Abeillé, Anne and Danièle Godard and Ivan Sag. 1997. French Relative Clauses. Ms. IUF & Paris 7, CNRS & Lille 3, and Stanford University.

Bach, Emmon and Robin Cooper. 1978. The NP-S analysis of relative clauses and compositional semantics. *LP* 2: 145-150.

Bouma, Gosse, Rob Malouf, and Ivan Sag. 1998. Satisfying Constraints on Extraction and Adjunction. Ms. Stanford Univ.

Cha, Jong-Yul. 1998. Relative Clause or Noun Complement Clause: The Diagnoses. In *Proceedings of the 11th International Conference on Korean Linguistics*, 73-82.

Chung, Chan. 1998. Argument Composition and long-distance scrambling in Korean: An extension of the complex predicate analysis. In Hinrich, Kathol, and Nakazawa (eds.), *Syntax and Semantics*, 30: 159–220. New York: Academic Press.

Chung, Chan. 1993. A lexical approach to inalienable possession construction in Korean. In Kathol and Pollard (eds), *Papers in Syntax: OSU Working Papers in Linguistics*, 44–87.

Chierchia, Gennaro and Sally McConnell-Ginnet. 1990. *Meaning and Grammar: An Introducition to Semantics*. Cambridge: MIT Press.

Copestake, Ann, Dan Flickinger, and Ivan A. Sag. 1997. Minimal recursion semantics: An introduction. Ms, Stanford Univ.

Davis, Tony. 1996. *Lexical Semantics and Linking in the Hierarchical Lexicon*. Ph.D. thesis, Stanford Univ.

Han, Jong-Im. 1991. *Movement and Empty Categories in Korean Syntax*. Doctoral Dissertation.

Han, Jong-Im. 1992. Syntactic Movement Analysis of Korean Relativization. *Language*

Research 28:2, 335-357

Hasegawa, Nobuko. 1984. On the So-called "Zero-pronouns" in Japanese. *The Linguistic Review* 4, 289-341

Hukari, Thomas E. and Robert D. Levine. 1995. Adjunct Extraction. *Journal of Linguistics*, 31(2): 195-226.

Kameshima, Nanako. 1990. On 'Aboutness Conditions'. In Hoji Hajime (ed.), *Japanese/Korean Linguistics* I: 255-67. Stanford: CSLI Publications.

Kang, Myong-Yoon. 1988. Syntactic Movement in Korean Relativization. *Linguistics in the Morning Calm* 2. Seoul: Hanshin Publishing.

Kaplan, Tamar I. et al. 1995. The Category of Relative Clauses in Japanese, with Reference to Korean. *Journal of East Asian Linguistics* 4.

Kitagawa, Chisato. 1982 Topic Constructions in Japanese. *Lingua* 57. 175-214.

Kim, Jong-Bok. 1995. *The Grammar of Negation: A Constraint-Based, Lexicalist Perspective.* Ph.D. Dissertation. Stanford University.

Kim, Jong-Bok. 1998. On the Mixed Properties of Pseudo Relative Clause Constructions. In B.-S. Park and James Yoon (eds.), *Proceedings of the 11th International Conference on Korean Linguistics*, 83-93.

Kim, Jong-Bok and Ivan, A. Sag. 1996. French and English Negation: A lexicalist alternative to head movement. Ms. Kyung Hee Univ. and Stanford University.

Kuno, Susumu. 1973. *The Structure of the Japanese Language.* Cambridge: MIT Press.

Matsumoto, Yoshiko. 1990. *The Role of Pragmatics in Japanese Relative Clause Constructions.*, *Lingua* 82: 111-129.

Manning, Christopher and Ivan A. Sag. 1995. Dissociations between argument structure and grammatical relations. Ms. Stanford Univ.

Na, Younghee and Geoffrey Huck. 1993. On the state of certain island violations in Korean. *Linguistics and Philosophy* 16: 181-229.

Nakamura, Akira. 1994. On the Tense System of Japanese. In Akatsuka, Noriko (ed.) *Japanese/Korean Linguistics*, IV: 363-77. Stanford: CSLI Publications.

Park, Byung-Soo. 1994. Modification vs. Complementation: The So-called Internally-Headed Relative Clauses Reconsidered. In A. Ishikawa and Y. Nitta (eds), *Proceedings of the 1994 Kyoto Conference: A Festschrift for Professor Akira Ikeya.*

Park, Byung-Soo and Jong-Bok Kim. 1998. Korean Relativization and an HPSG Analysis. Paper Presented at the Seminar of Korean Society of Language and Information.

Pollard, Carl and Ivan Sag. 1994. *Head-Driven Phrase Structure Grammar.* Chicago: The University of Chicago Press.

Sag, Ivan. 1997. English Relative Clause Constructions. *Journal of Linguistics*, 33: 431-484.

Sag, Ivan. and Janet D. Fodor. 1994. Extraction without traces. In WCCFL 13, Stanford: CSLI Publicatons.

Salleh, Ramli Md. 1983. Korean Relativization. *Language Research*, 19: 113-117.

Sirai, Hidetosi and Takao Gunji. 1998. Relative Clauses and Adnominal Clauses. *Topics in Constraint-based Grammar of Japanese*. Kluwer Academic Publishers.

Shin, Hyo-Phil. 1996. *The Syntax and Semantics of Korean Relative Clause Constructions.* (in Korean) Ph.D. Dissertation. Seoul National University.

Tagashira, Yoshiko. 1972. Relative Clauses in Korean.s In *The Chicago Which Hunt: Papers from the Relative Clause Festival*. CLS.

Uda, Chiharu. 1998. A Multiple Inheritance Analysis of the Internally Headed Relative Clause in Japanese. In *Language, Information, and Computation (PACLIC 12).*

Yoon, Jae-Hak. 1994. Different Semantics for Different Syntax: Relative Clauses in Korean. *Japanese and Korean Linguistics 4*,413-428. CSLI Publications.

Yoon, Jong-Ryul. 1991. On Genitive Relative Constructions in Korean. In Susumu Kuno et al eds. *Harvard Studies in Korean Linguistics IV.*