ARGUMENT COMPOSITION AND LINEARIZATION: KOREAN COMPLEX PREDICATES AND SCRAMBLING

Sun-Hee Lee

Abstract

This paper deals with the formation of complex predicates and some interesting scrambling facts in Korean. First, we extend the notion of complex predicates to include various noun-verb combinations by providing syntactic and semantic evidence. Within the HPSG framework, we then propose a general schema based on argument composition, which can be used for different types of complex predicates. Furthermore, in opposition to Chung (1998)'s approach using argument composition for scrambling phenomena, we argue that linearization constraint is better to account for various permutation possibilities in Korean.[1]

1 Introduction

Within the framework of Head-driven Phrase Structure Grammar, there have been various proposals on complex predicate (or CP) constructions in Korean; Chung (1998),

---

[1] I would like to thank Carl Pollard, Bob Kasper, and Bob Levine for their valuable comments and help. All errors and shortcomings are, of course, mine.

Bratt (1996), and Ryu (1993) analyzed each different kinds of CP construction. Chung (1998) proposed that an auxiliary verb and its preceding verb form a CP. Bratt (1996) extended the notion of a CP to combinations of a verb and the causative *hata*. Instead of verbal complexes, Ryu (1993) analyzed the combination of a noun and the light verb *hata*, so-called verbal noun construction as a CP. While maintaining different points of view in classifying CPs, all three researches utilized argument composition as the licensing mechanism of CPs.[2]

In this paper, we will focus on the formation of noun-verb CPs by extending Ryu's (1993) notion of verbal noun constructions. In requiring syntactic arguments, a verbal noun[3] functions as the main verbal or adjectival predicate of a sentence in Korean. A verbal noun combines with a small group of verbs, which lack the semantic properties normally associated with main predicates. In particular, those verbs have traditionally been called light verbs or function verbs. We refer to various combinations of a verbal noun and a verb in terms of noun-verb CPs as in (1)

(1) John-i   ku saken-ul   cosa-lul   ha-yess-ta
    John-Nom that accident-Acc investigation-Acc do-Past-Ending
    'John did an investigation of that accident.'

In example (1), *cosa-lul* (investigation-Acc) and *hata* form a single unit at the level of syntax even though they do not morphologically form a word. This combination exhibits some distinctive properties as one syntactic unit, so the notion of CPs can be applied to include these noun-verb complexes in Korean. This issue will be discussed in section 2.

In this study, we will provide an analysis of Korean CPs by presenting a revised version of Chung's (1998) Gov-Head schema. The schema will utilize argument composition mechanism as in Chung (1998), who extends its notion to license various word order facts. We, however, oppose to Chung's flat structure approach based on argument composition. Instead we will argue that a linearization model provides a more systematic explanation for scrambling facts in Korean. We will specify how the domain union of linearization theory based on Reape (1996) can be used for various scrambling phenomena not only within simplex clauses but also within complex clauses with an embedded clause.

The organization of this paper is as follows. In section 2, we briefly compare the previous analysis of Korean CPs and discuss various characteristics of noun-verb CPs. In section 3, we will explain the formation of CPs by providing a revised Gov-Head schema, which percolates the VALENCE feature of a noun into a higher phrasal category. This schema includes verbal CPs as well as noun-verb CPs. Section 4 deals with scrambling phenomena in Korean within a linearization model. A linearization approach provides a more succinct answer for both sentence internal and long-distance scrambling than Chung's (1998) argument composition approach.

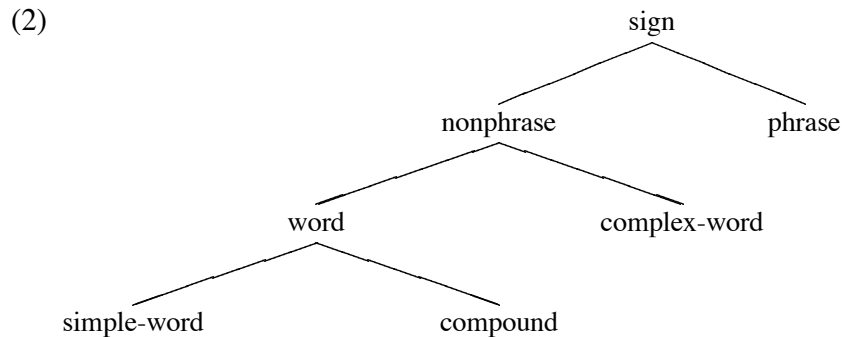[2]Argument composition was proposed by Hinrichs & Nakayama (1994).

[3]A great amount of verbal nouns in Korean originally come from Chinese or some foreign languages. For example, English verb "study" is adopted in Korean by taking the format of "study-Acc + do"

2 Complex Predicate Constructions

2.1 Formation of CPs

In general, the term CP has been used in reference to the broad range of predicates including both syntactic combinations of words and morphological combinations of a stem with various affixes. In this paper, however, we restrict the use of the term , CP to the former. A CP is considered to have a single argument structure and to work as a single unit at the syntactic level, even though its components do not morphologically form a single word.
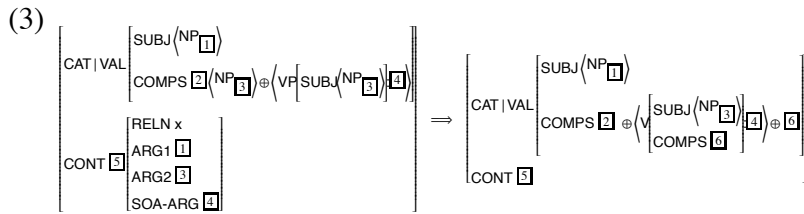
Focusing on the lexical compositional properties of CPs, Chung (1998) and Bratt (1996) discuss the formation of the Korean verbal complex within the HPSG framework. Chung (1998) analyzes certain auxiliary verb constructions as CPs using argument composition, as proposed by Hinrichs & Nakayama (1994). He introduces a new sort, *non-phrase*, with two subsorts *word* and *complex-word* into the sort hierarchy as in (2), which subsumes various kinds of CPs.

(2)
```
                        sign
                       /    \
                 nonphrase   phrase
                 /      \
              word    complex-word
             /    \
      simple-word  compound
```

Bratt (1996) argues that a combination of a verb and the causative verb *hata* form a CP like an auxiliary verb construction. Even though she uses argument composition, her analysis of CPs is different from Chung (1998) as follows: First, Chung does not include the causative *hata* construction[4] among the verbal complexes. Instead he analyzes the dative causative *hata* constructions as VP-complement structures and argues that they have flat structures derived by a lexical rule as follows.[5]

---

[4]There are two types of the causative *hata* in Korean; the first takes an NP with the accusative case {-lul} while the latter takes an NP with the dative case {-eykey}. Besides the causative verb *hata* constructions, the same form *hata* works as a light verb, which combines with a verbal noun. We will see these examples in section 2.2. The verb *hata* works as a proform for general verbs like the verb *do* in English.

[5]We slightly modify here some of the notations in the lexical rule that Chung (1998) provides. Note that Chung considers *hata* to be a control verb but not a component of a CP.

(3)
$$\begin{bmatrix} \text{CAT}\,|\,\text{VAL} \begin{bmatrix} \text{SUBJ}\,\langle\text{NP}_{\boxed{1}}\rangle \\ \text{COMPS}\,\boxed{2}\langle\text{NP}_{\boxed{3}}\rangle \oplus \langle\text{VP}[\text{SUBJ}\,\langle\text{NP}_{\boxed{3}}\rangle]_{\boxed{4}}\rangle \end{bmatrix} \\ \text{CONT}\,\boxed{5}\begin{bmatrix} \text{RELN x} \\ \text{ARG1}\,\boxed{1} \\ \text{ARG2}\,\boxed{3} \\ \text{SOA-ARG}\,\boxed{4} \end{bmatrix} \end{bmatrix} \Longrightarrow \begin{bmatrix} \text{CAT}\,|\,\text{VAL} \begin{bmatrix} \text{SUBJ}\,\langle\text{NP}_{\boxed{1}}\rangle \\ \text{COMPS}\,\boxed{2} \oplus \langle\text{V}\begin{bmatrix}\text{SUBJ}\,\langle\text{NP}_{\boxed{3}}\rangle \\ \text{COMPS}\,\boxed{6}\end{bmatrix}_{\boxed{4}}\rangle \oplus \boxed{6} \end{bmatrix} \\ \text{CONT}\,\boxed{5} \end{bmatrix}$$

The input to the above lexical rule is a lexical entry with a controller NP and a VP complement in the COMPS list of a governing verb. Argument Composition as introduced by Hinrichs & Nakayama (1994) allows syntactic composition of two predicates in the input and structure sharing of their arguments via the operation append(⊕).[6] Through argument composition, the unsaturated arguments of the argument predicate are introduced into the argument structure of the selecting predicate. Based on this, the clause headed by *hata* causative verb has the canonical structure allowing free word order variation as in (4).

(4)
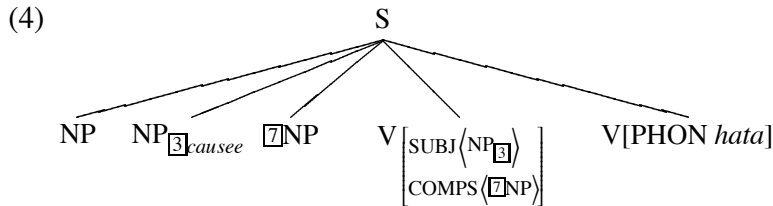
By contrast, Bratt claims that the causative *hata* forms a verbal cluster with its preceding verb without using a lexical rule. According to her, the canonical structure of the causative constructions can be presented as in (5).

(5)
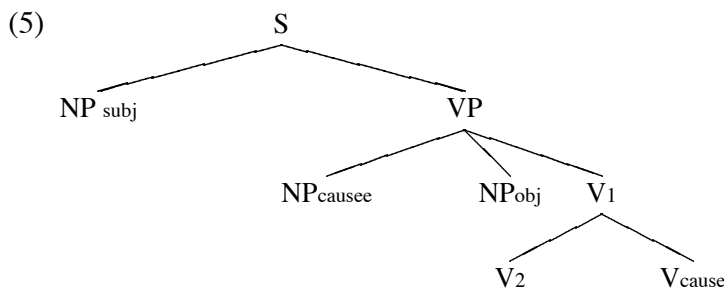
    Second, while Bratt concludes that causatives with dative and accusative case share the same structures, Chung distinguishes two different causative constructions: a control verb construction and a raising construction.[7] .

---

[6]A list satistifes the description $D_1 \oplus D_2$ if it is the concatenation of two lists satisfying the description D_1 and D_2 respectively.

[7]Chung claims that the accusative *hata* causatives are more restricted than the dative causatives with respect to scrambling.

Third, with respect to scrambling, Chung argues that clause internal scrambling and long-distance scrambling are explained by the same mechanism of argument composition in Korean. Bratt, however, proposes that clause-bounded scrambling is fundamentally different from long distant scrambling.

When we consider adjunct scope in the causative *hata*-construction, it is hard to support Chung's argument that the causative verb *hata* takes a VP complement. In the following examples, an adverb modifies only the immediately following verb in an embedded S- or VP-complement construction. However, the two different interpretations of (6c) show that the adverb *kakkum* (sometimes) takes scope over not only the immediately following verb but also the whole causative verbal complex.

(6) a. John-i   [s Mary-ka   chayk-ul kakkum   ilke-yahan-tako] malhayssta
         John-Nom   Mary-Nom book-Acc sometimes read-must-Comp said
         'John said that Mary should read a book sometimes.'

     b. John-i   Mary-eykey [vp chayk-ul kakkum   ilk-ulako]   seltukhayssta
         John-Nom Mary-to   book-Acc sometimes read-Ending persuaded
         'John persuaded Mary to sometimes read a book.'

     c. John-i   Mary-eykey chayk-ul kakkum   [ilk-key   hayessta]
         John-Nom Mary-Dat   book-Acc sometimes   read-Ending caused
         1. 'Sometimes John caused Mary to read a book.'
         2. 'John caused Mary to sometimes read a book.'

Further evidence that the adverb modifies not only the immediately following predicate but also the whole cluster is that the occurrence of an adverb is semantically restricted by the whole verbal cluster. Consider the example (7).

(7) John-i   Mary-lul   han sikan-maney kippu-key   hayessta
     John-Nom Mary-Acc one hour-in   be happy-Ending caused
     'John caused Mary to be happy in an hour.'

In Korean, the adverbial phrase *han sikan man-ey*, the correspondent of the time adverbial *in an hour*, modifies only telic predicates which specify the end point of the

---

1. Mary-ka   ku chayk-ul ilk-key   John-eykey hayessta
    Mary-Nom that book-Acc read-Ending John-to   caused
    'Mary caused John to read the book.'

2. *Mary-ka ku chayk-ul ilk-key   John-ul   hayessta
    Mary-Nom that book-Acc read-Ending John-Acc caused
    'Mary caused John to read the book.'

There seems to be a difference between an accusative NP and others in Korean. We are not sure whether we must distinguish two causatives according to the case marker of an NP or not. Since this is not one of main concerns of this paper, we will not discuss it further.

event. Although the adjective *kipputa* (be happy) is stative, and therefore is not a telic predicate, the adverbial *han sikan man-ey* appears in (7). This suggests that it modifies the event of causing Mary to be happy as a whole. Thus, the adverbials in the causative *hata* constructions can modify either the causative relation or the lower verb's semantic relation. This is hard to explain without accepting the verbal complex analysis of the lower verb and the causative verb *hata*. In addition, the sentence adverb scope undermines the claim that the causative *hata* takes a VP as its argument. In general, a sentential adverb of a matrix predicate does not occur among the elements of the embedded S or VP as in (8b) and (9b), but it can intervene between the embedded verb and its argument as in (10b).

(8) a. tahaynghi, John-i   [s Mary-ka   chayk-ul ilk-key]   hayessta
     fortunately John-Nom   Mary-Nom book-Acc read-Ending caused
     'Fortunately, John caused Mary to read a book.'

   b. *John-i   [s Mary-ka,   tahaynghi, chayk-ul ilk-key]   hayessta
     John-Nom   Mary-Nom fortunately book-Acc read-Ending caused
     'Fortunately, John caused Mary to read a book.'

   c. *John-i   [s Mary-ka   chayk-ul, tahaynghi, ilk-key]   hayessta
     John-Nom   Mary-Nom a book   fortunately read-Ending caused
     'Fortunately, John caused Mary to read a book.'

(9) a. tahaynghi, John-i   Mary-ul [vp chay-ul   ilk-key]   seltukhayessta
     fortunately John-Nom Mary-Acc   book-Acc read-Ending persuaded
     'Fortunately, John persuaded Mary to read a book.'

   b. *John-i   Mary-ul [vp chay-ul, tahaynghi, ilk-key]   seltukhayessta
     John-Nom Mary-Acc   book-Acc fortunately read-Ending persuaded
     'Fortunately, John persuaded Mary to read a book.'

(10) a. tahaynghi, John-i   Mary-eykey chayk-ul   ilk-key hayessta
     fortunately John-Nom Mary-Dat   book-Acc read   caused
     'Fortunately, John caused Mary to read a book.'

   b. John-i   Mary-eykey chayk-ul, tahaynghi, ilk-key   hayessta
     John-Nom Mary-Dat   book-Acc fortunately read-Ending caused
     'Fortunately, John caused Mary to read a book.'

2.2   Verbal Noun Constructions as CPs

In addition to auxiliary verb constructions and the causative *hata* constructions, there are some combinations of a noun and a verb which have been classified as CPs in Korean.

(11) a. John-i   <u>ku saken-ul</u>   cosa-ul   ha-yess-ta
        John-Nom that accident-Acc investigation-Acc do-Past-Ending
        '*John did an investigation of that accident.*'

    b. John-i   <u>ku saken-uy</u>   cosa-lul   ha-yess-ta
        John-Nom that accident-Gen investigation-Acc do-Past-Ending
        '*John did an investigation of that accident.*'

(12) a. John-i   <u>kutul-kwa</u> hyepsang-ul   ha-yess-ta
        John-Nom them-with negotiation-Acc do-Past-Ending
        '*John made a negotiation with them.*'

    b. John-i   <u>kutul-kwa-uy</u> hyepsang-ul   ha-yess-ta
        John-Nom them-with-Gen negotiation-Acc do-Past-Ending
        '*John made a negotiation with them.*'

In the given examples, the underlined elements are required by *cosa* (investigation) and *hyepsang* (negotiation), and not by *hata*. This kind of argument-predicate relationship is supported by the examples of (11b) and (12b); the elements can be realized under the NP by taking a genitive case marker. A notable point is that the underlined elements are realized directly under the VP in (11a) and (12a). If the arguments were located in the sister position of the verbal noun, we would expect topicalization, or pseudocleft formation to be prohibited like normal elements under NPs as follows.

      [topicalization]

(13) a. ku saken-un   John-i   cosa-lul   ha-yess-ta
        that accident-Top John- Nom investigation-Acc do-Past-Ending
        '*As for that accident, I did an investigation.*'

    b. kutul-kwa-nun John-i   hyepsang-ul   ha-yess-ta
        them-with-Top John-Nom negotiation-Acc do-Past-Ending
        '*As for with them, John made a negotiation.*'

[pseudocleft]

(14) a. John-i   cosa-lul   ha-n   kes-un   ku saken-ita
John-Nom investigation-Acc do-Rel what-Top that accident-Copular
'What John did an investigation was that accident'

b. John-i   hyepsang-ul   ha-n   kes-un   kutul-kwa-ita
John-Nom negotiation-Acc do-Rel what-Top them-with-Copular
'Who John made a negotiation with was them.'

Morphologically, nominal argument takes genitive case only under an NP in Korean as in the following examples.

(15) a. Yenghuy-ka   chingwu-uy oppa-lul   salanghanta
Yenghuy-Nom friend-Gen brother-Acc loves
'Yenghuy loves her friend's brother.'

b. *chingwu-nun Yenghuy-ka   oppa-lul   salanghanta
friend-Top   Yenghuy-Nom brother-Acc loves
'As for a friend, Yenghuy loves her brother.'

c. *Yenghuy-ka oppa-lul   salangha-nun kes-un   chingwu-ita
Yenghui-Nom brother-Acc loves-REL   who-Top friend-copula
'It is her friend whose brother Yenghuy loves.(lit)'

The accusative case 'ul/lul' and the postposition *wa/kwa* (with) in (11a) and (12a) show that the underlined arguments come directly under the VP node of the sentence. In the given examples, the argument structure of the CP is mainly inherited from the nominal component, the combining noun has been called a verbal noun. Besides the verb *hata* has been considered to take a functional role by accompanying a tense or aspect marker and completing a sentence while it does not semantically restrict the arguments of a sentence as other predicates. In this respect, the verb *hata* is similar to auxiliary verbs, so has been called a light verb in contrast with other verbs (heavy verbs).[8]

The verbal noun constructions have been paid much attention in the literature, including Grimshaw & Mester's (1988) proposal of argument transfer, which percolates arguments of the nominal to the light verb, Ahn's (1989) analysis based on a heavy and light verb distinction, and Ryu's (1993) approach within the HPSG framework. Among the various mechanisms for explaining the formation of noun-verb complexes, Ryu (1993) uses argument composition, following the idea of Hinrichs & Nakayama (1994).[9] Similarly, Lee

---

[8]Especially in generative grammar including Grimshaw & Mester (1988) and Ahn (1989).

[9]Instead of argument composition, he actually uses the term 'argument transfer' but there is not much difference.

(1993) uses theta-role raising to V-bar within the GB framework.[10] Even though it has not been noticed in many previous approaches on CPs, there are many other verbs which can be combined with verbal nouns besides the light verb *hata*. Let us consider the following examples.

(16) a. John-i   ku saken-ul   cosa-lul   machi-ess-ta
     John-Nom that accident-Acc investigation-Acc finish-Past-Ending
     'John finished the investigation of that accident.'

   b. John-i   ku saken-uy   cosa-lul   machi-ess-ta
     John-Nom that accident-Gen investigation-Acc finish-Past-Ending
     'John finished the investigation of that accident.'

(17) a. John-i   kutul-kwa hyepsang-ul   kkuthnay-ess-ta
     John-Nom them-with negotiation-Acc end-Past-Ending
     'John ended the negotiation with them.'

   b. John-i   kutul-kwa-uy hyepsang-ul   kkuthnay-ess-ta
     John-Nom them-with-Gen negotiation-Acc end-Past-Ending
     'John ended the negotiation with them.'

Moreover, there are some combinations of a verbal noun and a verb in which the verb cannot be substituted for by the verb *hata*.

(18) a. Na-nun nay salm-ey hoyuy-lul   nukki-ess-ta
     I-Top   my life-in   skepticism-Acc feel-Past-Ending
     'I felt a skepticism in my life.(lit)'

   b. Na-nun sulpum-lul nukki-ess-ta
     I-Top   sorrow-Acc feel-Past-Ending
     'I felt sorrow.'

(19) a. Chelswu-ka   John-eykey kocangnan sikye-lul   swuli-lul   mathki-ess-ta
     Chelswu-Nom John-to   broken   watch-Acc repair-Acc entrust-Past-Ending
     'Chelswu entrusted the repair of a broken watch to John.'

   b. Na-nun John-eykey caysan-ul   mathki-ess-ta
     I-Top   John-to   property-Acc entrust-Past-Ending
     'I entrusted my property to John.'

---

[10]Grimshaw & Mester (1988) also proposes an operation of 'argument transfer' to deal with the syntax of light verb constructions. However, their account is dependent on the notion of 'partial argument transfer', which does not apply to Korean. For this, refer to Lee (1993) and Ryu (1993).

The underlined arguments *nay salm-ey* (my life-in) and *kocangnan sikye-lul* (broken watch-Acc) are not related to the argument structure of *nukkita* and *mathkita*. Considering this, the combinations of a noun and a verb of (18) and (19) are similar to the light verb *hata* constructions. The arguments of a noun cannot form pseudocleft sentences or be topicalized, while the arguments of a verbal noun can. Pointing out these properties, Lee (1993) suggested that a verbal noun licenses its arguments in VP by constituting a CP construction with a specific verb as in the light verb *hata* constructions.

Adverb scope supports that a verbal noun and its following verb form a single syntactic unit. In general, adverbs of manner and degree tend to immediately precede their modifying verbal categories. In the above sentences, they precede the verbal nouns[11]

(20) a. Na-nun ku saken-ul   chelcehi   cosa-lul   ha-yess-ta
         I-Top   that accident-ul thoroughly investigation-Acc do-Past-Ending
         'I did an investigation of that accident thoroughly.'

     b. Na-nun ku saken-ul   cosa-lul   chelcehi   ha-yess-ta
         I-Top   that accident-ul investigation-Acc thoroughly do-Past-Ending
         'I did an investigation of that accident thoroughly.'

(21) a. Na-un nay salm-ey khukey hoyuy-lul   nukki-ess-ta
         I-Top my life-in   greatly skepticism-Acc feel-Past-Ending
         'I greatly felt a skepticism in my life.'(lit)

     b. Na-nun nay salm-ey hoyuy-lul   khukey nukki-ess-ta
         I-Top   my life-in   skepticism-Acc greatly feel-Past-Ending
         'I greatly felt a skepticism in my life' (lit)

There are some adverbs that are morphologically related to the adjectives modifying verbal nouns as we see in (20) and (21).

(22) Na-nun ku saken-ul   chelcehan cosa-lul   ha-yess-ta
      I-Top   that accident-ul thorough   investigation-Acc do-Past-Ending
      'I did a thorough investigation of that accident.'

(23) Na-nun salm-ey khun hoyuy-ul   nukki-ess-ta
      I-Top   life-in   great skepticism feel-Past-Ending
      'I felt a great skepticism in my life.'(lit.)

The adverbs like *chelcehakey* and *khukey* do modify nouns in Korean. The morphological correspondence between an adverb and an adjective suggests that these modifiers are semantically related to the verbal noun rather than to the verbs.

---

[11]This, however, is not a strong evidence since those adverbs commonly precede objective NPs in Korean.

3   Argument Composition

In this section, we will discuss the formation of CPs. Following Chung (1998) and Bratt (1996), we basically assume argument composition for the noun-verb CP constructions. Argument Composition refers to the mechanism that *a*ttracts the arguments of the complement to the valence list of the head.

To deal with verbal noun CPs, Ryu (1993) adopted the structure sharing mechanism but he did not propose a new schema capturing the formation of a CP. Instead, he uses the head-complement schema for the general combinations of a head and its complements. With this schema, CPs cannot be differentiated from general object and verb combinations.[12] Furthermore, his Head-Comp schema allows partial structure sharing of arguments similar to Grimshaw & Mester's argument transfer, so it incorrectly licenses the following ungrammatical examples.

(24) a. *John-i   tosekwan-ey [NP chayk-uy pannap-ul] ha-n-ta
           John-Nom library-to   book-Gen return-Acc do-Pres-Ending
           'John returns the book to the library.'

      b. *John-i   Mary-eykey [NP kkoch-uy   senmwul-ul] ha-n-ta
           John-Nom Mary-to   flower-Gen present-Acc do-Pres-Ending
           'John presents flowers to Mary.'

Chung (1998) also proposed the Gov-Head schema licensing verbal CPs.[13] According to Chung (1998),however, only nonphrasal categories are allowed to appear as a governed element, so we cannot explain the fact that a governed element can be modified by an adverb or an adjective as follows.

---

[12]In addition, Ryu includes *sikhita* (to cause), *toyta* (to become) in the same category with *hata*. According to him, these verbs derive causative or passive CPs from verbal nouns and cause a change in grammatical function at the level of the syntax without depending on a lexical rule. The notion of grammatical function change here is, however, not clear to me. Even though Ryu categorized some verbs causing grammatical function change as function verbs, empirically many verbs form a CP both verbal nouns. The arguments of the noun can appear directly under the VPs as we have already seen in the previous section.
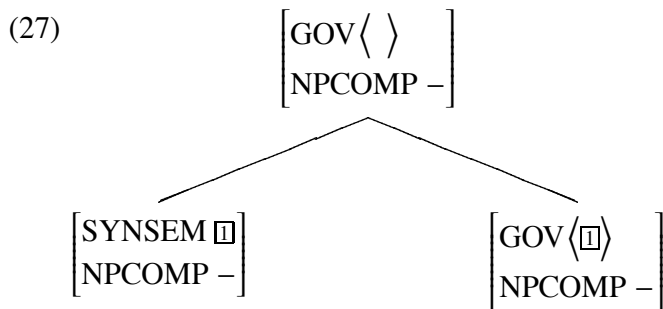
[13]Chung (1998) proposes the Gov-Head schema and demonstrates how it works for auxiliary verb complex predicates in Korean. With this schema, however, we cannot fully explain the formation of CPs including the causative verb *hata* or verbal nouns.

complex-word[GOV⟨ ⟩]

nonphrase[SYNSEM ①]   simple-word[GOV⟨①⟩]
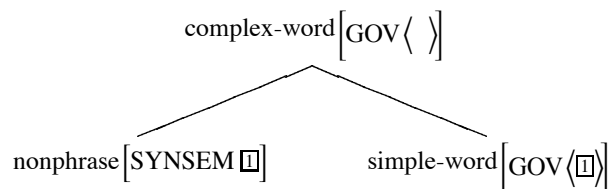
(25) John-i   Mary-eykey [[ppalli ka-key]   hayessta]
     John-Nom Mary-to   fast   go-Ending made
     'John made Mary go fast.'

(26) John-i   ku saken-ul   [[chelcehan cosa-lul]   hayessta]
     John-Nom that accident-Acc   thorough investigation-Acc did
     'John did thorough investigation of that accident.'

In order to correctly capture the formation of a verbal noun construction, we propose to revise the Gov-Head schema proposed by Chung (1998) to license a new type of syntactic structure working as a single unit at the level of syntax as in (27).

(27)
$$\begin{bmatrix} \text{GOV} \langle \ \rangle \\ \text{NPCOMP} - \end{bmatrix}$$

$$\begin{bmatrix} \text{SYNSEM} \ \boxed{1} \\ \text{NPCOMP} - \end{bmatrix} \qquad \begin{bmatrix} \text{GOV} \langle \boxed{1} \rangle \\ \text{NPCOMP} - \end{bmatrix}$$
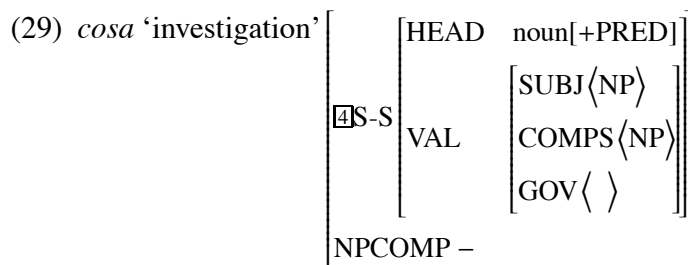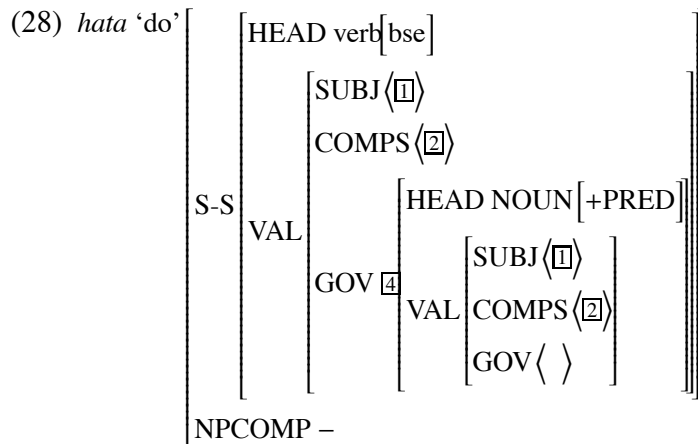

For the revised schema, we assume two features, GOV(ERNMENT) and NPCOMP. GOV feature takes either an empty list or a singleton list containing a governee's SYNSEM value. This captures the syntactic relationshipt between a governee, a verbal noun and a head, the following verb. We can use the NPCOMP feature in order to capture adjunct modification of a governed element. NPCOMP is the feature which Hinrichs and Nakazawa (1994) use for recording whether a verbal projection (or, in the present setting a verbal noun projection) has yet discharged any nominal arguments. In case an argument of a verbal noun is realized within the verbal noun phrase by taking the genitive case, a verbal noun and the following verb are a syntactic combination which is formed by the Head-Comp/Head-Subject schema. Thus, a verbal noun in this case takes an [NPCOMP +] and its combination with the following predicate does not form a CP.

The ungrammatical examples like(24) can be excluded from CPs because the Gov-Head schema does not apply for noun-verb combinations. The Gov-Head schema works as a syntactic schema not only for noun-verb CPs but for other CPs as well, including auxiliary verbs and causative constructions.[14] In verbal noun constructions, the combining
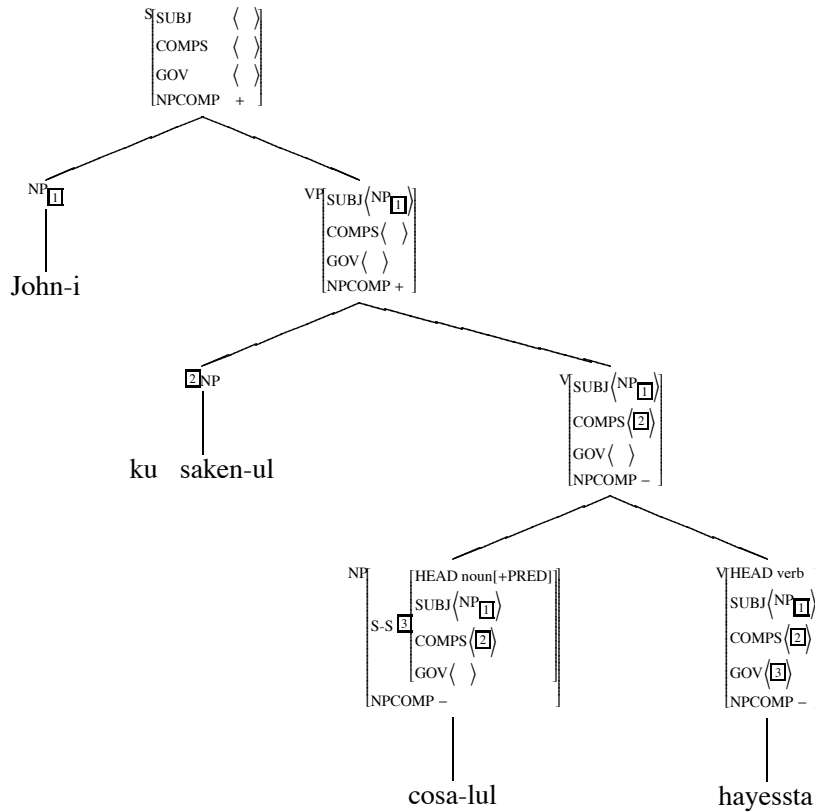
---

[14]With respect to scrambling, there is some difference among the three types of CPs since auxiliary verb constructions do not allow intervention of adjuncts between a verb and the following auxiliary verb. This can be treated in terms of morphological properties of auxiliary verbs. In Korean, all the auxiliary verbs immediately follow main predicates, so they have been assumed to form morphosyntactic constructions according to traditional grammar. Here, we attribute the prohibition of adjuncts in auxiliary verb constructions to the property of AUX in Korean, as explained in section 4.

verb syntactically subcategorizes for the preceding verbal noun via the GOV feature just as an auxiliary verb or the causative verb *hata* does. When we consider the head final linear ordering and the fact that case marking of a verbal noun depends on the combining verb in Korean, we can conclude that the final verb functions as the head. The lexical entries of the light verb *hata* and a verbal noun *cosa* can be provided as in the following examples.

(28) *hata* 'do'
$$
\begin{bmatrix}
\text{S-S} & \begin{bmatrix} \text{HEAD verb}[\text{bse}] \\ \text{VAL} \begin{bmatrix} \text{SUBJ}\langle\boxed{1}\rangle \\ \text{COMPS}\langle\boxed{2}\rangle \\ \text{GOV}\ \boxed{4}\begin{bmatrix} \text{HEAD NOUN}[+\text{PRED}] \\ \text{VAL}\begin{bmatrix} \text{SUBJ}\langle\boxed{1}\rangle \\ \text{COMPS}\langle\boxed{2}\rangle \\ \text{GOV}\langle\ \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix} \\
\text{NPCOMP} -
\end{bmatrix}
$$

(29) *cosa* 'investigation'
$$
\begin{bmatrix}
\boxed{4}\text{S-S} & \begin{bmatrix} \text{HEAD}\quad \text{noun}[+\text{PRED}] \\ \text{VAL} \quad \begin{bmatrix} \text{SUBJ}\langle\text{NP}\rangle \\ \text{COMPS}\langle\text{NP}\rangle \\ \text{GOV}\langle\ \rangle \end{bmatrix} \end{bmatrix} \\
\text{NPCOMP} -
\end{bmatrix}
$$

Based on this schema, argument composition allows arguments of the verbal noun to become arguments of the CP. These provide the following structure for the verbal noun CP constructions.

(30)

S
[SUBJ ⟨ ⟩
COMPS ⟨ ⟩
GOV ⟨ ⟩
NPCOMP +]

NP₁

John-i

VP
[SUBJ ⟨NP₁⟩
COMPS ⟨ ⟩
GOV ⟨ ⟩
NPCOMP +]

₂NP

ku saken-ul

V
[SUBJ ⟨NP₁⟩
COMPS ⟨₂⟩
GOV ⟨ ⟩
NPCOMP −]

NP
[HEAD noun[+PRED]
S-S ₃[SUBJ ⟨NP₁⟩
COMPS ⟨₂⟩
GOV ⟨ ⟩]
NPCOMP −]

cosa-lul

V
[HEAD verb
SUBJ ⟨NP₁⟩
COMPS ⟨₃⟩
GOV ⟨₃⟩
NPCOMP −]

hayessta

The lexical entry of *hata* shows that it subcategorizes for the verbal noun *cosa* (investigation)and allows the inheritance of arguments through argument composition. Lexical specification of a verbal noun and the light verb *hata* brings two separate lexical items together at the syntactic level through the Gov-Head schema. This mechanism explains how two independent categories function as a single syntactic unit.

4 Linearization with respect to Scrambling

Even though Korean is generally considered to be a free word order language, some specific restrictions exist. As is well-known, an argument cannot appear in the position where it follows its head. This phenomenon appears in noun-verb complex constructions, too.

(31) a. John-i   secem-eyse ku chayk-ul kwuip-ul   ha-yess-ta
       John-Nom bookstore-at that book-Acc purchase-Acc do-Past-Ending
       '*John purchased that book at the bookstore.*'

    b. John-i   ku chayk-ul secem-eyse kwuip-ul   ha-yess-ta
       John-Nom that book-Acc bookstore-at purchase-Acc do-Past-Ending
       '*John purchased that book at the bookstore.*'

c. *John-i   secem-eyse kwuip-ul   ku chayk-ul ha-yess-ta
   John-Nom bookstore-at purchase-Acc that book-Acc do-Past-Ending
   'John purchased that book at the bookstore.'

As in (31), the complement NP *ku chayk-ul* (that book) cannot follow its head *kwuip* (purchase). This fact can be explained by the following LP constraint, which is needed to explain the head-final property of Korean.

(32) a. X < [COMPS $\alpha \oplus \langle X \rangle \oplus \beta$]

     b. X < [GOV $\langle X \rangle$]

The property of free word order in Korean can be found not only among the elements in a simple sentence but also in a complex sentence containing an embedded VP or S complement.

(33) a. John-i   Mary-eykey ku chayk-ul   ilk-ulako   seltukhayssta
          John-Nom Mary-to   that book-Acc read-Comp persuaded
          'John persuaded Mary to read that book .'

     b. John-i   ku chayk-ul   Mary-eykey ilk-ulako   seltukhayssta
          John-Nom that book-Acc Mary-to   read-Comp persuaded

     c. ku chayk-ul,   John-i   Mary-eykey ilk-ulako   seltukhayssta
          that book-Acc John-Nom Mary-to   read-Comp persuaded

(34) a. John-i   Mary-ka   hakyo-eyse nolko iss-tako   sayngkakhayssta
          John-Nom Mary-Nom school-at   be playing-Comp thought
          'John thought Mary is playing at the school.'

     b. hakkyo-eyse John-i   Mary-ka   nolko iss-tako sayngkakhayssta
          school-at   John-Nom Mary-Nom playing-Comp thought

     c. John-i   hakkyo-eyse Mary-ka   nolko iss-tako   sayngkakhayssta
          John-Nom school-at   Mary-Nom be playing-Comp thought

Considering that the subject of the embedded clause changes its position and the matrix subject does not appear in the embedded clause, we can identify that it is the element of the embedded phrase or clause which changes its canonical position.[15] In order to capture this property, Chung (1998) provides a flat structure analysis. According to him, the elements of the embedded VP or S are freely ordered unless a specific LP constraint applies.

---

[15]In case of (34b), it is hard to tell what is the element that changes it canonical position. In general, a focused or topicalized element occupies the sentence initial position out of its canonical position in Korean.

He, furthermore, proposes a lexical rule using argument composition for a verb forming a complex sentence. As an output of the lexical rule, flat structures are licensed. The flat structure analysis, however, requires less realistic VP or S as an input of the lexical rule, which does not exist any more in the output structure. With the application of the lexical rule, all the elements inside of the VP or S-complement appear among the elements of the matrix predicate, so we cannot find the embedded VP or S in the outputs. The elements of the embedded VP or S, however, form a constituent in the output structure since they can be replaced by an anaphoric verb phrase *kulehkey hata* (do so) or *kulayssta*(did so).

(35) a. John-i   Mary-eykey ku chayk-ul   ilk-ulako   seltukhayss- ta
        John-Nom Mary-to   that book-Acc read-Comp persuaded-Ending
        'John persuaded Mary to read that book.'

     b. John-un   Tom-eykey-to kulehkey ha-lako seltukhayss-ta
        John-Top Tom-to-also   do so-Comp   persuaded-Ending
        'John also persuaded Tom to do so.'

(36) a. John-i Tom-eykey Mary-ka   ku chayk-ul   ilkess-tako   malhayss-ta
        John-i Tom-to   Mary-Nom that book-Acc read-Ending told-Ending
        'John told Tom that Mary read that book.'

     b. John-i   Jim-eykey-to kulayss-tako   malhayss-ta
        John-Nom Jim-to-also   (she) did so-Comp told-Ending
        'John also told to Jim that (she) did so '

In (35) and (36), *kulehkey ha-lako* (do so-Comp) replaces the VP *ku chayk-ul ilk-ulako* (read that book) and *kulayss-tako* ((she) did so-Comp), the whole S. The flat structure approach is hard to capture this kind of phrasal constituency. Chung's lexical rule takes a phantom S or VP only in the input structure, but by going through the application of the rule, it does not exist in the output structure. Thus, it is hard to explain why there is some evidence of syntactic combinations of a noun and a verb. Another defect of the argument composition approach is that it does not explain the asymmetric distribution of adjuncts in S- and VP-complement structures, as Chung (1998) himself admits.[16]

(37) a. Mary-ka <u>ilcwuil ceney</u> [s John-i ku proceyhthu-lul kkuthnay-yahan-tako] malhayssta
        M-Nom one week ago   J-Nom the project-Acc   finish-must-Comp   told
        'One week ago, Mary said that John had to finish the project'

     b. Mary-ka [s John-i ku proceykthu-lul kkuthnay-yahan-tako] <u>ilcwuil ceney</u> malhayssta
        M-Nom   J-Nom that project-Acc   finish-must-Comp   one week ago told

---

[16]According to Chung, argument composition gives a flat structure for a sentence containing an S-complement. By this mechanism, he argues that scrambling out an S-complement can be accounted for. He also argues that an adjunct of the matrix head verb may occur any place in a sentence once the argument composition rule is applied. He argues that an adjunct of a complement verb is attracted to the ADJT list of a matrix verb instead of COMPS list unless something else is said.

    c. *Mary-ka [s John-i <u>ilcwuil ceney</u> ku proceykthu-lul kkuthnay- yahan-tako] malhayssta
        M-Nom   J-Nom one week ago that project-Acc   finish-must-Comp   told

    d. *Mary-ka [s John-i ku proceykthu-lul <u>ilcwuil ceney</u> kkuthnay- yahan-tako] malhayssta
        M-Nom   J-Nom that project-Acc   one week ago finish-must-Comp   told

The adjunct modifying the matrix predicate in (37a) cannot intervene among the elements of the embedded sentence as in (37c) and (37d). However, it still modifies the martrix predicate when it follows the embedded clause as in (37b). In contrast, an adjunct modifying the embedded predicate scrambles out of the embedded sentence as we have already seen in (34).[17] In order to explain this asymmetry, Chung proposes the following Interpretive Principle which requires that the adjunct be semantically dependent on the embedded predicate in a certain structure.[18]

(38) *Interpretive Principle* : Suppose (i) that Y is an NP[nom], (ii) that X is the first verb following Y, and (iii) that Z is any constituent occurs between Y and X. Then Z cannot be a semantic dependent (semantic argument or functor) of a verb superordinate to X.

This restriction excludes the ungrammatical examples of (37c) and (37d). However, this assumption is rather ad hoc since it requires a configurational restriction to block ungrammatical examples. Moreover, this kind of configurational restriction is not enough to cover the fact that the same phenomenon exists in VP-complement constructions, even though Chung argues that it does not.

(39) a. John-i   Mary-eykey [vp ku chayk-ul   nayil   ilk-ulako] seltukayssta
       John-Nom Mary-to   that book-Acc tomorrow read-Comp persuaded
       'John persuaded Mary to read the book tomorrow'

    b. John-i   nayil   Mary-eykey [vp ku chayk-ul   ilk-ulako] malhaysstta
       John-Nom tomorrow Mary-to   that book-Acc read-Comp persuaded
       'John persuaded Mary to read the book tomorrow.

(40) a. tahaynghi John-i   Mary-ekey [vp chong-ul patak-ey noh-ulako] seltukhayssta
       fortunately John-Nom Mary-to   gun-Acc floor-on put-Comp   persuaded
       'Fortunatly, John persuaded Mary to put the gun on the floor.'

    b. *John-i Mary-eykey [vp chong-ul patak-ey tahanghi   noh-ulako] seltukhayssta
       John-i Mary-to   gun-Acc floor-on fortunately put-Comp persuaded
       'Fortunately, John persuaded Mary to read the book loudly.'

Since Chung's interpretive principle does not include the configuration of the VP, it does not explain the contrast in (39) and (40).[19] In addition, the same asymmetry can be

---

[17]The sentences (34a) and (34b) are ambiguous, so the adverb can be interpreted to modify a matrix verb as well as the embedded verb.

[18]Refer to p.203 in Chung (1998).

[19]Even though topicalization and preposing are common phenomena in Korean, they are not applicable to two more elements. Thus, it is hard to claim that two elements are simultaneously scrambled in (40b).

found not only in adjuncts but also in arguments in the embedded S or VP constructions as follows.

(41) a. Mary-ka Tom-eykey [S John-i ku proceykthu-lul kkuthnay-yahanta-ko] malhayssta
M-Nom T-to J-Nom that project-Acc finish-Must-Comp told
'Mary told Tom that John must finish the project.'

b. ku proceykthu-lul, Mary-ka Tom-eykey [S John-i kkuthnayya-hanta-ko] malhayssta
that probject-Acc M-Nom T-to J-Nom finish-must-Comp told

c. Mary-ka, ku proceykthu-lul, Tom-eykey [S John-i kkuthnay-yahanta-ko] malhayssta
M-Nom that probject-Acc T-to J-Nom finish-must-Comp told

d. *Mary-ka [S John-i, Tom-eykey , ku proceykthu-lul kkuthnay-yahanta-ko] malhayssta
M-Nom J-Nom T-to that project-Acc finish-must-Comp told

e. *Mary-ka [S John-i ku proceykthu-lul, Tom-eykey, kkuthnay-yahanta-ko] malhayssta
M-Nom J-Nom that project-Acc Tom-to finish-must-Comp told

As we see in (41b)and (41c), the argument of the embedded S *ku proceykthu-lul* (that project-Acc) appears among the elements of the matrix predicate *malhata* (told). However, the argument of the matrix predicate *Tom-eykey* (Tom-to) cannot intersperse among the elements of the embedded clause as in (41d) and (41e). It can be argued that an element(or elements) of the embedded predicate move out of the embedded clause. However, this claim can be reputed by the fact that the subject of the embedded clause precedes it; the subject of an embedded predicate has been known not to scramble out of the embedded clause in Korean. The fact that the embedded subject *John-i* precedes *Tom-eykey* shows that the element of the matrix predicate appears in noncanonical position.[20]

We, thus, argue that it is the sentencial adverb which goes through scrambling. However, it is not easy to determine which element appears in noncanonical position in the following example.

i. John-i Mary-ekey chong-ul tahanghi patak-ey noh-ulako seltukhayssta
John-Nom Mary-to gun-Acc fortunately floor-on put-Comp persuaded
'Fortunately, John persuaded Mary to put the gun on the floor.'

We can provide two kind of structures for the sentence as follows.

ii. John-i Mary-eykey chong-ul tahaynghi [VP t patak-ey noh-ulako] seltukhayssta
John-i Mary-to gun-Acc fortunately floor-on put-Comp persuaded

iii. John-i Mary-eykey t [VP chong-ul tahaynghi patak-ey noh-ulako] seltukhayssta
John-i Mary-to t gun-Acc fortunately floor-on put-Comp persuaded

In the given example, the adverb *tahaynghi* (fortunately) modifies the matrix sentence. If it is analyzed to have the structure of (ii), it is not compatible with the asymmetric facts in scrambling into an S or VP argument. In (i), we can observe that pause or pitch accent frequently appears with *chong-ul* (gun-Acc) but not with *tahaynghi* (fortunately). Putting pause or pitch accent is a common phenomenon among the elements which occur in noncanonical position. In other words, it suggests that it is the element of the embedded VP which undergoes the scrambling.

[20]Even though most elements can be topicalized by taking topic marker *un/nun* occurring in the sentence initial position in Korean, the embedded subject is hard to topicalize. It also cannot be used as a head noun of a relative clause. This supports that the embedded subject does not intersperse among the elements of the matrix predicate in (i).

In summary, Chung's interpretive rule only deals with the scrambling of the modifiers of the embedded predicate, so it is not enough to explain the scrambling asymmetry between an embedded VP or S and a matrix clause. By depending on argument composition, we need to assume several interpretive rules to deal with the same kind of scrambling asymmetry, which is not a desirable situation.

In order to handle the scrambling phenomena systematically, we propose that Reape-style linearization theory is more naturally applicable than the analysis based on argument composition. By accepting a fundamental dissociation between syntactic structure and linear order, a systematic explanation can be provided for various constituent orders and moreover, the asymmetric behavior of adjuncts in long distance scrambling can be handled without introducing the hypothesis of intermediate flat structures. While the formation of CPs is accounted for by argument composition, word order variation can be effectively handled by using the linearization model (Dowty (1996), Reape (1996), Pollard Carl & Kasper (1993), Kathol (1995)).

The linearization approach makes a basic distinction between tectogrammatical and phenogrammatical structure. Tectogrammatical structure involves grammatical-function based, compositional structure of a sentence, while phenogrammatical structure involves the actual form of the words in a string with a particular ordering. Dowty proposes that discontinuous syntactic phenomena can be correctly described by LP principles but not by hierarchical structures based on phrase structure trees.

Reape (1996) introduces the phenogrammatical notion of word order domains, which involves the actual ordering of words in sentences. Tectogrammatic combinations can appear as discontinuous or non-adjacent elements. Reape restricts word order through domain union. Domain union is a sequence union relation of two DOM values, which represent linear order information, $\cup <> (A, B, C)$ where C is the result of sequence unioning A and B and contains all and only the elements of them. Thus, the relative order of elements of any daughter domain must be the same as that of its mother domain. Adapting Reape's idea for representing information about linear order, Pollard Carl & Kasper (1993) propose that DOM features do not take signs as their values but rather a grouping of PHON and SYNSEM attributes. In Kathol (1995) this type of grouping is referred as to DOM(AIN)-OBJ(ECT), rather than NODE as in Pollard Carl & Kasper (1993). We also follow Calcagno (1993) in assuming that words are specified for a word order domain, so that every sign (phrasal and lexical) bears a DOM feature.[21]

---

i. *John-un Mary-ka   Tom-eykey [ku proceykth-lul kkuthnay-yahan-tako] malhayssta.
John-Top Mary-Nom Tom-to   that project-Acc   finish-must-Comp   told
'*Mary told Tom that John must finish the project.*'

ii. *Mary-ka   Tom-eykey [ku proceykth-lul kkuthnay- yahan-tako] malha-n John
Mary-Nom Tom-to   that project-Acc   finish-must-Comp   told-Rel John
'*John who Mary told Tom that must finish the project.*'

[21]Reape assumes that a DOM is appropriate only for phrasal signs. Extending Pollard, Levine & Kasper's (1993) idea, Calcagno points out that once DOM is defined on all signs, we can constrain the order of elements in a DOM value by more general constraints on signs. The ID schemata mediate between tectogrammatical

Through the feature DOM, phenogrammatical information is encoded. Kathol (1995), furthermore, argues that a domain object, which contains linear order information projected from a sign, is associated with that sign by the compaction relation.

(42)

$$\text{compaction}\left\langle\begin{bmatrix}\text{sign}\\\text{SYNSEM }\boxed{1}\\\text{DOM}\left\langle[\text{PHON}\boxed{2}], ..[\text{PHON }\boxed{n}]\right\rangle\end{bmatrix}, \begin{bmatrix}\text{dom-obj}\\\text{SYNSEM }\boxed{1}\\\text{PHON }\boxed{2}\circ,...\circ\boxed{n}\end{bmatrix}\right\rangle$$

According to Kathol, instead of having a separate DOM-OBJ attribute containing SYNSEM and PHON values, we can map a sign's SYNSEM value directly on the corresponding domain object. The PHON value of the domain objects corresponds to the concatenation of the PHON values of all the elements in the sign's domain. With the notion of compaction, we can easily explain the reason why the element of the matrix predicate does not intervene among the elements of the embedded VP or S as we observed (41d) and (41e). Since the embedded S or VP is compacted by combining with its head verb, the element of the matrix predicate cannot be inserted into it. Compaction, however, is too restrictive to fully license scrambling possibilities in Korean. This kind of element insertion into a higher domain while other elements are compacted together can be explained by replacing the notion of compaction with partial compaction as proposed in Kathol (1995). Intuitively, partial compaction allows designated domain objects to be liberated into a higher domain, while the remaining elements of the source domain are compacted. The definition of partial compaction is provided as follows.

(43) (p-compaction $\boxed{1}$, $\boxed{2}$, $\boxed{3}$) $\equiv$

$$\boxed{1}:\begin{bmatrix}\text{sign}\\\text{SYNSEM }\boxed{4}\\\text{DOM }\boxed{6}\end{bmatrix} \wedge \boxed{2}:\begin{bmatrix}\text{dom-obj}\\\text{SYNSEM }\boxed{4}\\\text{PHON }\boxed{7}\end{bmatrix} \wedge \text{shuffle}(\boxed{5}, \boxed{3}, \boxed{6}) \wedge \text{ join}_{\text{PHON}}(\boxed{5},\boxed{7})$$

In long-distance scrambling constructions as in (41b) - (41c), the designated element of the embedded clause becomes liberated into the higher domain, while the remaining elements are compacted into a single domain object through partial compaction. In general, the liberated element receives focus interpretation by accompanying pause or pitch accent. This mechanism licenses scrambling of an element out of an embedded S or VP. In contrast, an element of the matrix predicate does not scramble into the embedded S or VP, which is already compacted together as in (41d) and (41e).

Now let us consider how this kind of phenogrammatical information can be encoded. Instead of using distinct Head-Subject and Head-Complement Schema, Kathol
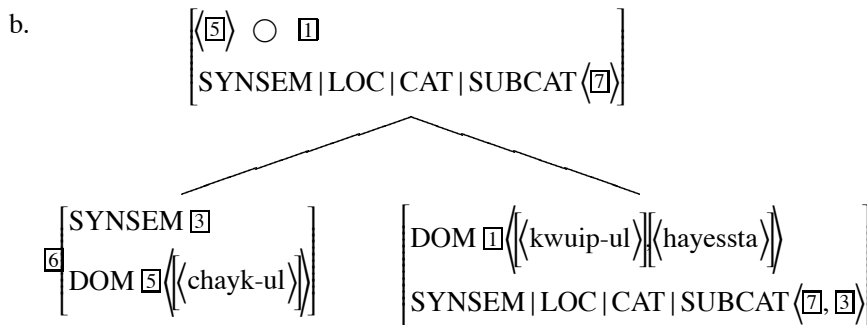
---

notion and phenogrammatical information by way of the DOM attribute.

uses a binary Head-Argument Schema for licensing particular combinations of signs.[22] Moreover, he proposes a Head-Argument Composition Relation dispensing with phrase structure-based analysis using the DTRS attribute in favor of relation based syntactic combination.

(44) The ternary relation HEAD-ARGUMENT COMPOSITION holds of three signs M, H, and A if and only if:

1. M's SYNSEM | LOCAL | CAT | COMPS is token-identical to H's SYNSEM |LOCAL | CAT | COMPS value minus A's SYNSEM value.

2. M's DOM value is a sequence union of H's DOM value and < CA> , where CA is the p-compaction of A.

Adopting the above Head-Argument Composition Relation for syntactic combination of a head and its complements including subjects in Korean, we drop the TOPO feature from the constraint, which is introduced for languages like German. According to this rule, the domain of the mother is the sequence union of the domain of the head daughter with the singleton list containing the compaction of the argument. Through compaction and sequence union, essentially a shuffle operator, arbitrary permutations of a domain can be licensed unless LP constraints are provided. The combination of a CP and its complement can be licensed by Head-Argument Composition as follows.

(45) a. John-i   chayk-ul kwuip-ul   ha-yess-ta
       John-Nom book-Acc purchase-Acc do-Past-Ending
       'John purchased a book.'

b.

$$
\begin{bmatrix}
\langle 5 \rangle \ \bigcirc \ 1 \\
\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT}\,|\,\text{SUBCAT}\,\langle 7 \rangle
\end{bmatrix}
$$

$$
6\begin{bmatrix}
\text{SYNSEM}\ 3 \\
\text{DOM}\ 5\,\langle\!\langle\text{chayk-ul}\rangle\!\rangle
\end{bmatrix}
\qquad
\begin{bmatrix}
\text{DOM}\ 1\,\langle\!\langle\text{kwuip-ul}\rangle\!\langle\text{hayessta}\rangle\!\rangle \\
\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT}\,|\,\text{SUBCAT}\,\langle 7, 3 \rangle
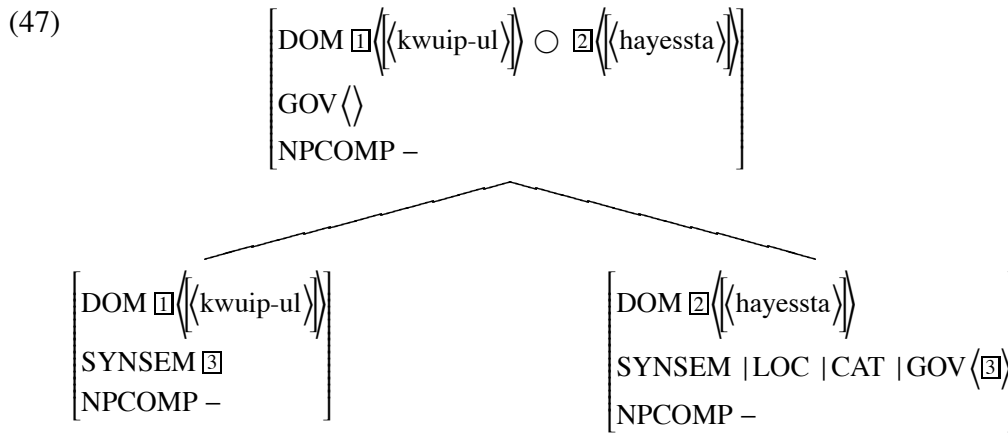\end{bmatrix}
$$

For licensing the combination of a verbal noun and a head verb in the above structure, we need another Composition Relation. On the basis of the Gov-Head schema, which has been presented in the previous chapter, the Gov-Head Composition Relation can be given as follows.

---

[22]Kathol (1995) argues for this general combinatorial system in order to avoid the differences in the argument structures of finite and nonfinite verbs posited by Kiss and others, and to avoid positing different representations of subjects of fronting constructions in German. For this, refer to Kathol (1995) ch.5 and ch.7. This is not directly relevant to this paper, however.

(46) A sign M is licensed in a Gov-Head Composition Relation, provided there exist two signs G(overnee) and H(ead), such that:

1. M's SYNSEM | LOCAL | CAT | GOV value is token-identical to H's SYNSEM | LOCAL | CAT | GOV value minus G's SYNSEM value

2. M, G, H's NPCOMP values are −.

3. M's DOM value is the append of H's DOM value with G's DOM value.

    This relation licenses the following local composition of a verbal noun and a head in (47).

(47)

$$
\begin{bmatrix}
\text{DOM } \boxed{1}\langle\!\langle\langle\text{kwuip-ul}\rangle\rangle\!\rangle \; \bigcirc \; \boxed{2}\langle\!\langle\langle\text{hayessta}\rangle\rangle\!\rangle \\
\text{GOV} \langle\rangle \\
\text{NPCOMP} -
\end{bmatrix}
$$

$$
\begin{bmatrix}
\text{DOM } \boxed{1}\langle\!\langle\langle\text{kwuip-ul}\rangle\rangle\!\rangle \\
\text{SYNSEM } \boxed{3} \\
\text{NPCOMP} -
\end{bmatrix}
\qquad
\begin{bmatrix}
\text{DOM } \boxed{2}\langle\!\langle\langle\text{hayessta}\rangle\rangle\!\rangle \\
\text{SYNSEM} \,|\,\text{LOC}\,|\,\text{CAT}\,|\,\text{GOV} \langle\boxed{3}\rangle \\
\text{NPCOMP} -
\end{bmatrix}
$$

Depending on the above relational constraints, the following sentences are licensed.

(48) a. DOM $< [kuchayk - ul], [John - i], [kwuip - ul], [hayessta] >$

      b. DOM $< [kuchayk - ul], [John - i], [kwuip - ul], [hayessta] >$

      c. *?DOM $< [John - i], [kuchayk - ul], [hayessta], [kwuip - ul] >$

      d. *DOM $< [John - i], [kwuip - ul], [kuchayk - ul], [hayessta] >...$

As we see in the above examples, there are some restrictions on the permutations. Following Chung (1998) and Calcagno (1993), we can exclude the ungrammatical examples of (48c) and (48d) by the Head Final Constraint. This holds for the governed elements of CPs such as verbal nouns or other verbs as well as arguments. We need the following constraint for the immediate precedence between a verb and an auxiliary verb in Korean.[23]

---

[23]In auxiliary verb construction, delimiters can intervene between a predicate and the following auxiliary verb. This kind of insertion is commonly found in complex or compound word constructions. It is attributed to the morpho-syntactic property of delimiters in Korean. Thus, it does no harm for the LP constraint.

(49) $X \ll {}_V \begin{bmatrix} \text{AUX} & + \\ \text{COMPS} & \langle X \rangle \end{bmatrix}$

Now let us consider adjuncts interspersed among complements. For the syntactic combination of a head and an adjunct, we need another relational constraint of Head-Adjunct Composition Relation similar to the Head-Argument Composition Relation.

(50) The ternary relation Head-Adjunct Composition holds of three signs, M, H and A if and only if:

   1 H's SYNSEM value is token identical to A's SYNSEM | LOCAL | CAT | MOD value.

   2 M's DOM value is a sequence union of H's DOM value and < C_A >, where C_A is the compaction of A.
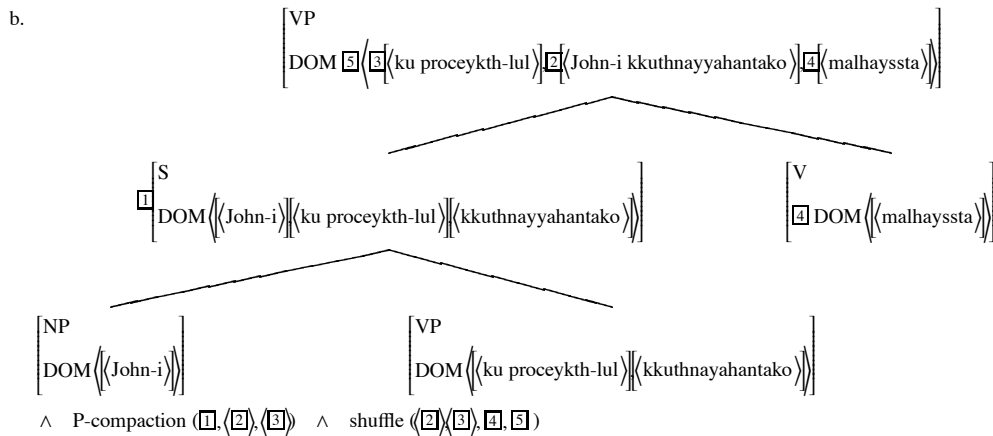
Based on the Head-Adjunct Composition Relation, the following DOM value of the phrase containing an adjunct phrase and its head is licensed.

(51) a. secem-eyse chay-ul   kwuip-ul   ha-yess-ta
      bookstore-at book-Acc purchase-Acc do-Past-Ending
      '(I) purchased a book at the book store.'

   b. $\left\langle \begin{bmatrix} \text{PHON secem-eyse} \\ \text{SYNSEM } \alpha \end{bmatrix}, \begin{bmatrix} \text{PHON chayk-ul} \\ \text{SYNSEM } \beta \end{bmatrix}, \begin{bmatrix} \text{PHON kwuip-ul} \\ \text{SYNSEM } \gamma \end{bmatrix}, \begin{bmatrix} \text{PHON hayessta} \\ \text{SYNSEM } \delta \end{bmatrix} \right\rangle$

Within a linearization model, we can provide the following structure for the example containing an element, which scrambles out of the embedded S argument. We repeat the example (41c) in (52).

(52) a. Mary-ka   ku proceykth-lul Tom-eykey [s John-i   kkuthnay-yahan-tako] malhayssta
      Mary-Nom that project-Acc Tom-to   John-Nom finish-must-Comp   told
      'Mary told Tom that John must finish that project.'

   b.

$\wedge$ P-compaction ($\boxed{1}, \langle \boxed{2} \rangle, \langle \boxed{3} \rangle$) $\wedge$ shuffle ($\langle \boxed{2} \rangle \langle \boxed{3} \rangle, \boxed{4}, \boxed{5}$)

As shown in (52), the embedded sentence becomes compacted when it combines with the verbal head while the focused element *ku proceykth-lul* (that project-Acc) is scrambled out of it. In other words, the focused element is inserted into the domain of the matrix VP. The rest of the embedded clause *John-i kkuthnayyahantako* (John-Nom finish-must-Comp) is compacted together forming a single list when it combines with the verb *malhyassta*(told).

In case the list of liberated domain objects is empty, however, the domain object of the sign is totally compacted to a single list. In that case no element of the matrix verb intervene among the compacted elements. This correctly captures the asymmetry in long distance scrambling between the elements of the matrix and the embedded clauses. Partial compaction involves Focus or Topic interpretations. Therefore, the exact mechanism introducing this sort of compaction relation should be more carefully investigated by considering various pragmatic sort of information; however, we leave this subject for future study.

5   Conclusion

In this paper, we examined various kinds of CPs in Korean and tried to draw some generalizations based on the similarities among them. The combination of a verbal noun and a verb shows various properties of CPs. Especially, adverb scope can be used as one of the identifying tools for a CP in Korean both verbal and noun-verb complex. A CP is formed by an argument composition mechanism, as proposed by Hinrichs & Nakayama (1994). We have shown that the syntactic coherence of a CP can be captured by Gov-Head schema licensed by the lexical properties of a verbal noun and the following verb. We argue that while argument composition captures the properties of CPs, it is not quite appropriate to explain various scrambling facts as Chung (1998) proposes. His flat structure analysis based on argument composition does not fully explain long-distance scrambling without rather arbitrary interpretive rules. By using the linearization model, we claim that scrambling facts can be more systematically explained. This approach enhances the explanatory power of the theory by providing proper empirical generalizations for distinct syntactic phenomena. Long-distance scrambling phenomena, however, are entangled with complicated pragmatic factors such as focus or topic interpretations, which remains as an important subject for future study.

References

Aʜɴ, Hᴇᴇ-Dᴏɴ. 1989. *Ling Verb, VP-Movement, Negation and Clausal Architecture*. Madison, WI: Univ. of Wisconsin-Madison dissertation.

Bʀᴀᴛᴛ, Eʟɪᴢᴀʙᴇᴛʜ. 1996. *Argument Composition and the Lexicon; Lexical and Periphrastic Causatives in Korean*. Stanford, CA: Stanford Univ. dissertation.

Cᴀʟᴄᴀɢɴᴏ, Mɪᴋᴇ. 1993. Toward a linearization approach to word order variation in japanese. *OSU Working Papers in Linguistics* 42.24–45.

CHUNG, CHAN. 1998. Argument composition and long-distance scrambling in korean. In *Complex Predicates in Nonderivational Syntax*, ed. by Andreas Kathol & Michael Bernstein, 159–220. San Diego, CA: Academic Press.

DOWTY, DAVID. 1996. Towards a minimalist theory of syntactic structure. In *Discontinuous Constituency, Natural language processing, number 6.*, ed. by Harry Bunt & Arthur van Horck, 11–62. Berlin: Mouton, Germany: Mouton-De Gruyter.

GRIMSHAW, JANE, & ARMIN MESTER. 1988. Light verbs and θ-marking. *Linguistic Inquiry* 19.205–232.

HAN, HAK SUNG. 1988. Light verbs and θ-marking. *Language Research* 4.4.

HINRICHS, ERHARD, & TSUNEKO NAKAYAMA. 1994. Linearizing auxs in german verbal complexes. In *German in Head-Driven Phrase Structure Grammar, CSLI Lecture Notes 46*, ed. by John Nerbonne, Klaus Netter, & Carl J. Pollard, 11–37. Stanford, CA: CSLI Publishcation.

JAYASEELAN, K.A. 1988. Complex predicates and θ-theory. In *Thematic Relations, Syntax and Semantics 21*, ed. by W.Wilkins, –. Academic Press.

JEONG, TAEGOO. 1992. *Argument Structure and Serial Verbs in Korean*. Austin, TX: Univ. of Texas dissertation.

KASPER, BOB, & CARL POLLARD. 1993. A relational interpretation of linear precedence constraints. Ms., Ohio State University.

KATHOL, ANDREAS. 1995. *Linearization-based German Syntax*. Columbus, OH: The Ohio State University dissertation.

LEE, SUN HEE. 1993. Complex precdicate constructions in korean. *Mal* 18.

POLLARD, CARL, & IVAN SAG. 1994. *Head-Driven Phrase Structure Grammar*. Chicago, IL: Univ. of Chicago Press.

POLLARD CARL, BOB LEVINE, & BOB KASPER. 1993. Studies in constituent ordering:toward a theory of linearization in head-driven phrase structure. Grand Proposal to the NSF.

REAPE, MIKE. 1996. Getting thigs in order. In *Discontinuous Constinuecy,. Natural language processing, number 6*, ed. by Harry Bunt & Arthur van Horck, 209–253. Berlin, New York: Mouton de Gruyter.

RYU, BYONG-RAE. 1993. Structure sharing and argument transfer-an hpsg approach to verbal noun construction. Seminar für Sprachwissenschaft Universität Tübingen.

SELLS, PETER. 1991. Complex predicates and argument structure in korean. *Harvard Studies in Korean Linguistics* 4.

YOO, EUN JUNG. 1993. Subcategorization and case marking in korean. *OSU Working Papers in Linguistics* 42.178–198.