A Lexical Approach to Word Order Variation in Korean

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1995

A LEXICAL APPROACH

TO WORD ORDER VARIATION IN KOREAN

DISSERTATION

Presented in Partial Fulfillment of the Requirements for

the Degree Doctor of Philosophy in the Graduate

School of The Ohio State University.

By

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* * * * *

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1995

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To my family and
to the memory of my father

ii

ACKNOWLEDGEMENTS

I would like to express my sincere thanks to my advisor, Carl Pollard, for his precise and insightful comments, endless encouragement, and careful personal attention throughout whole years of my graduate study at the Ohio State University. Especially at the time of finishing the dissertation, I cannot avoid the feeling of privilege to have had such a great advisor. Needless to say, the desire of exploring Head-Driven Phrase Structure Grammar (HPSG) has arisen from frequent interactions with him. I am very grateful to him for having allowed me to participate in the NSF project (studies in constituent ordering in HPSG) as an RA. Many basic ideas of this dissertation have been inspired from group discussion on the project.

My thanks also extend to other dissertation committee members, Peter Culicover, Craige Roberts, and Robert Levine for their helpful and insightful comments. Peter Culicover guided me to broaden my views and to consider the same phenomena from different angles, especially from the GB point of view. Without him, I might have missed incorporating many important previous researches into my dissertation. Craige Roberts, comments was very helpful, especially for the organization of the dissertation and for filling up some logical gaps. Without her, this dissertation might have been just a

iii

collection of separate pieces of papers. I am also thankful to Robert Levine for his comments.

I also appreciate Robert Kasper, Adreas Kathol and Eun Jung Yoo, who were the members of the NSF project discussion group, for their comments and discussion, especially on the earlier version of chapters 4 and 5. Their comments made me reconsider the earlier analyses which now I believe was too complicated. I also thank Mineharu Nakayama in the East Asian department for having provided me with relevant Japanese literature and references. His comments helped me to escape from falsely overgeneralizing some of my claims into Japanese data.

My thanks also go to Korean colleagues in our department -- Gwang Yoon Go, Hyunseok Kang, Woo Soon Kang, Heyri Kim, No Ju Kim, Ki-Suk Lee, Eun Jung Yoo and Jae Hak Yoon -- for their generosity on time whenever I bothered them with Korean data. Discussion with them often helped me to clarify vague ideas. I also appreciate the teachers back in Korea -- my former advisor Prof. Byung Soo Park, Prof. Yong Il Kong, and Prof. Sang Cheol Ahn -- for their support and encouragement.

As for outside of linguistic society, I express my deepest thanks to the ones who are most important in my life, my wife Kyung Hee and my son Wook. I thank them for their patient waiting, understanding, and helps in every aspect. I could not imagine how my graduate study could be done without them. I wish I could put their names on my diploma instead of mine. I am also grateful to our parents in Korea for their special support and patience, especially, to my father, who had missed us so much but passed away last winter without seeing us again.

iv

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FIELDS OF STUDY

Major Field: Linguistics

· Studies in Syntax and Semantics

TABLE OF CONTENTS

CHAPTER I

INTRODUCTION

Debates on configurationality have arisen from observations that languages such as Warlpiri differ from languages like English in that the former have the following properties that lack in the latter. (Hale (1982)):

(1)   a.   great freedom of surface word order

        b.   frequent uses of discontinuous constituents

        c.   complex verb word system (verbal complexes)

        d.   use of a rich case system

        e.   frequent "pronoun drop"

        f.   lack of pleonastic NPs (e.g., *it* and *there* in English)

        g.   lack of NP movement

Languages like English, called configurational languages, tend to lack the properties in (1), while languages like Warlpiri, called nonconfigurational languages, tend to have properties in (1). According to these criteria, Korean must be considered a

nonconfigurational language, since it has all of the properties in (1) except (1g).[1]

The goals of this thesis are not to investigate all of the properties in (1). Rather, we will mainly focus on the first three properties and explore a theory that can account for these properties in Korean. More concretely, we will focus on investigating answers to the following questions about Korean:

(2)   a.   How can great freedom of linear order among constituents (scrambling hereafter) be accounted for, e.g., is scrambling an instance of move-α or base-generated in a flat structure? (chapter 2)

       b.   What are the effects of scrambling on binding principles A, B and C, and weak crossover? (chapters 2 and 5)

       c.   How can the verbal complex system (the auxiliary verb construction) be accounted for? (chapter 3)

       d.   Does so-called long-distance scrambling (clause-external scrambling) syntactically differ from clause-internal scrambling, i.e., what syntactic mechanism is involved in long-distance scrambling? (chapter 5)

From the perspective of theoretical frameworks, we are concerned with the following:

---

[1]As to the property of (1g), Korean has constructions derived by NP-movement such as passivization and raising.

(3)   a.   What kind of syntactic theory is preferred to account for the issues described in (2)? (chapters 1, 2 and 7)

       b.   How can an information- and lexicon-based theory like Head-Driven Phrase Structure Grammar account for the issues in (2)?

The organization of this introductory chapter is as follows. In section 1.1, we will sketch four different types of previous analyses, which are directly relevant to accounts of scrambling in Korean or Japanese, pointing out their problems. In section 1.2, we introduce the current HPSG framework (Pollard and Sag (1987, 1994)), which will be the theoretical framework of this thesis. In section 1.3, we will briefly outline our own analyses, which may be considered as a descendant of two of the analyses introduced in sections 1.1 (the analyses in subsections 1.1.1 and 1.1.4), in spite of fundamental differences. Overall organization of this thesis is also displayed in this section.

1.1. Debates on Word Order Variation: Previous Analyses and Their Problems

1.1.1. Dual Representations: Lexical Structure and Constituent Structure

It has long been taken for granted that English clause structure is hierarchical in the sense that it has a VP node as in (4):

(4)
```
              S
           /     \
         NP       VP
          |      /   \
          |     V     NP
          |     |      |
        Mary  likes  John
```
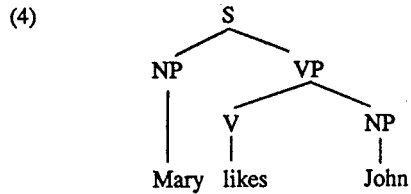
The VP node in (4) passes some constituency tests such as the proform test and the coordination test, and thus the existence of the hierarchical structure (existence of the VP node in (4)) is supported by theory-independent evidence. However, such constituency tests cannot be validly carried over to languages such as Korean and Japanese (See chapter 2 and Hinds (1974)), and thus the theory independent motivation for assuming the VP node in these languages is quite weak, compared with that of English. Another striking difference between English and Korean (or Japanese) is that the former has fixed word order, whereas the latter has relatively free word order.

To account for these differences as well as the properties in (1), Chomsky (1981), Williams (1981), Hale (1983), Jelinek (1983), and Mohananan (1983), among others assume that two different level of representations are paired at D-structure and S-structure. For example, Chomsky (1981:132) describes it as follows:

(5)   We may think of D- and S-structure as being pairs (α, ß), where α is a formal syntactic structure [i.e., constituent structure (CS)] and ß is a representation of associated grammatical functions [i.e., lexical structure (LS)]... For English, ß is derived from α by abstraction from order, etc. For Japanese [and Korean], α

is a "flat" structure formed by [(6) below] and ß is essentially the same as the corresponding element in English.

(6)   XP → YP*   X

The rule in (6) states the following: (i) the head is final, (ii) linear order of non-head constituents is free, and (iii) the constituent structure is flat since there is no intermediate constituent between the head and its maximal projection.

According to (5), the Korean sentences shown in (7) are licensed by the pair in (8):

(7)   a.   Mary$_i$-ka   caki$_i$-lul   pinanhayssta.
           M-Nom   self-Acc   criticized

          'Mary$_i$ criticized herself$_i$.'

      b.   Caki$_i$-lul   Mary$_i$-ka   pinanhayssta.
           self-Acc   M-Nom   criticized

(8)   a. CS: S
```
               /‾‾‾‾|‾‾‾‾\
             NP     NP      V
              |      |      |
          Mary-ka  caki-lul  pinanhayssta
```

b. LS:

```
                    S
        ┌───────────┘└──────────┐
       NP                       VP
        │              ┌─────────┘└──────┐
        │             NP                 V
        │              │                 │
     Mary-ka        caki-lul        pinanhayssta
```
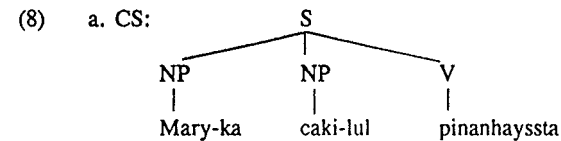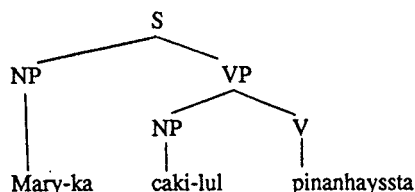
On this approach, the scrambling shown in (7) is accounted for by the flat CS in (8a), whereas the binding facts are accounted for by the hierarchical LS in (8b), i.e., even in (7b), *caki-lul* 'self' is still c-commanded by *Mary-ka* at LS, so that principle A is satisfied. (See Mohanan (1983) for the claim that binding principles apply at LS, and chapters 2 and 5 of this thesis for more detailed discussion on binding principles in Korean.)

As described in (5), the level of LS is a structure of grammatical functions which are associated with the level of CS. More precisely, Hale (1989:294) describes it as follows: [LS is] the "grammatical projection", which defines, for example, the strictly grammatical organization of a verb and its arguments, identifying the grammatical functions borne by the arguments and abstracted away from linear order relations among elements. Positing this level of representation raises many questions. One of the important questions has to do with a formal property of the LS. That is, why must LS be represented by a hierarchical structure, instead of a certain set of information indicating which argument is a subject and which argument is an object? If LS is a hierarchical structure, how is it licensed in nonconfigurational languages? Do we need two sets of PS rules that apply at LS and CS, separately? If LS turns out to be just a set of information

mentioned above, then how do binding principles work there? What is the relationship between LS and CS? Is one derived from the other, or do they exist independently? If the former is the case, what is the direction of the derivation and involved derivational rules? If the latter is the case, what is the general algorithm that associates the elements in LS and CS? To summarize, a crucial problem of this approach seems to be the fact that the formal property of the new level, LS, is far from clear. See Marácz and Muysken (1989) for more questions on the matter of formal properties of LS.

An empirical question about the LS/CS dichotomy is raised when we consider so-called long-distance scrambling (scrambling out of an S- or VP-complement). Let us consider the examples in (9). Here the curly brackets in (9b) indicate that any permutations of the expressions within the brackets are possible.

(9) a.   Na-nun   [s   John-i   ku chayk-ul   Mary-hanthey
          I-Top   J-Nom   the book-Acc   M-to
          pilyecwuesstako]   sayngkakhanta.
          lent   think

          'I think that John lent the book to Mary.'

     b.   {ku chayk-ul,   Mary-hanthey}   Na-nun
          the book-Acc   M-to   I-Top
          [s   John-i ___   ___   pilyecwuesstako]   sayngkakhanta.
                J-Nom   lent   think

On the current approach, the sentence in (9a) has CS in (10):

(10)

```
                              S
        ┌─────────────────────┼──────────────────┐
       NP                     S                   V
        │        ┌────────┬───┼───────┐           │
        │       NP       NP  NP       V           │
        │        │       △    │       │           │
      na-nun   John-i  ku chyak-ul  Mary-hanthey  pilyecwuesstako  sayngkakhanta
```
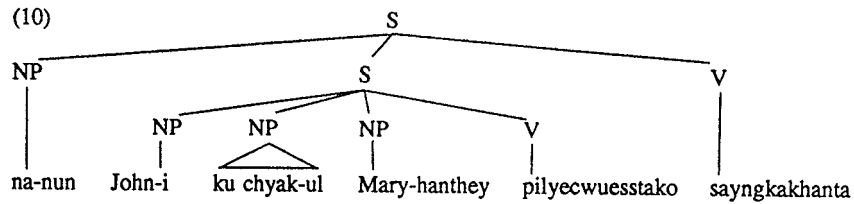
Here, note that the flat CS itself does not allow long-distance scrambling in (9b). To allow (9b), we must assume a different rule such as move-α in GB or the SLASH percolation mechanism in GPSG or HPSG. Then the question arises: does clause-internal scrambling syntactically differ from long-distance scrambling in Korean? As will be discussed in chapters 4 and 5, there seems to be some evidence that the two types of scrambling are indistinguishable, at least at the level of syntax, which entails that they must be considered to be uniformly accounted for by the same syntactic mechanisms. Then a problem with this approach is that it cannot uniformly account for both types of scrambling, i.e., on this approach, clause-internal scrambling is licensed by a flat structure, whereas long-distance scrambling is licensed by a different mechanism such as move-α or SLASH percolation.

1.1.2. Hierarchical Constituent Structure and Move-α

Besides the problems raised above, there is another matter that may cause a crucial problem for the dual representation theory. The problem is concerned with the debate over the existence of a VP node in Japanese or Korean. That is, it is claimed that a VP

node exists in these languages, which intervenes between a head verb and its full projection S (Saito and Hoji (1983), Saito (1985, 1992), Choe (1985, 1989), Y.S. Kang (1985), Gunji (1986), Miyagawa (1989), Sells (1990), and Yatabe (1993), among others).

For example, based on facts about principle C, WCO effects, and floated quantifiers in Japanese, Saito (1985) claims that positing the VP node is neccessary in Japanese, and thus that the CS of Japanese clause must be hierarchical, like that of English clause. (However, see chapter 2 for more detailed discussion of Saito's claims and the problems that arise when Korean data are considered.) Under the assumption that Japanese has hierarchical CS, Saito objects to the dual representation theory for the following reason. If Japanese needs a VP node at CS anyway, the CS is indistinguishable from the hierarchical LS. Thus, the separate LS at D- and S-structures is a redundant level of representation. Therefore, it would be more desirable if we assumed only one level of representation at D- and S-structures, namely hierarchical CS's, totally eliminating the level of LS.

On this approach, scrambling is accounted for by move-α. For example, the scrambling illustrated in (7b) is derived by adjunction of the object NP to the S node, as shown in (11):

(11)

```
                    S
          ┌─────────┴─────────┐
         NP                    S
          │           ┌────────┴────────┐
          │          NP                 VP
          │           │          ┌──────┴──────┐
          │           │         NP             V
          │           │          │             │
       caki-lul    Mary-ka       t        pinanhayssta
```
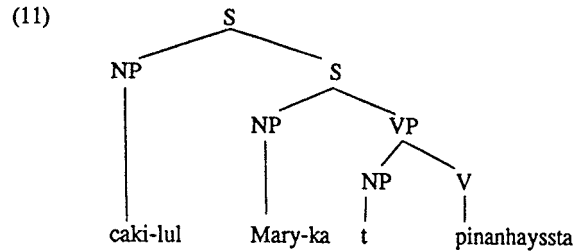
Here the binding facts may be accounted for by optional LF reconstruction (Saito (1992)). In (11), the scrambled anaphor *caki-lul* is optionally reconstructed to the trace position at LF, and then the anaphor is c-commanded by the subject NP, which satisfies principle A. (However, see sections 2.1.6 and 2.1.7 of chapter 2 for problems with the reconstruction approach in Korean.)

Even though this approach seems to be simpler than the dual representation approach, positing the existence of the VP node seems to be undermotivated and is not supported by any theory-independent evidence, especially when Korean data are considered. We will not fully discuss this matter in this section because all detailed arguments concerning this issue are developed in chapter 2.[2] In order to get a rough sense of our arguments against the hierarchical analysis, however, let us consider the simple variable binding examples in (12) and (13). (See Lee (1991) for a similar observation.)

---

[2] In chapter 2, we critically review eight different constructions and phenomena that are claimed to be problematic without positing the VP node, showing how all of them can be accounted for without assuming the VP node. Moreover, we will also show that positing VP node and move-α is neither a necessary nor a sufficient syntactic condition for accounts of scrambling and its effects on various binding facts in Korean.

(12) a. Nwu$_i$-ka   [caki$_i$/pro$_i$ emma]-lul   pinanhayssni?
       who-Nom   self/pro   mother-Acc   criticized

     'Who$_i$ criticized his$_i$ mother?'

   b. [caki$_i$/pro$_i$ emma]-lul   nwu$_i$-ka   ___   pinanhayssni?
       self/pro   mother-Acc   who-Nom   criticized

(13) a. Ne-nun   nwunwu$_i$-hanthey   [caki$_i$/pro$_i$ sensayngnim]-lul
       you-Top   who-to   self/pro   teacher-Acc
       sokayhaycwuessni?
       introduced

     'To whom$_i$ did you introduce his$_i$ teacher?'

   b. */??   [caki$_i$/pro$_i$ sensayngnim]-lul   ne-nun
          self/pro   teacher-Acc   you-Top
          nwunwu$_i$-hanthey   ___   sokayhaycwuessni?
          who -to   introduced

According to Saito's account, the acceptability of (12b) is accounted for via LF reconstruction, i.e., the scrambled NP *caki/pro emma-lul* 'his mother' is reconstructed into the trace position at LF, making the configuration of (12b) the same as that of (12a) at LF. If variable binding is assumed to occur at LF, then both (12a) and (12b) are correctly predicted to be acceptable by satisfying a certain c-command relation. However, a problem arises from (13b). If we reconstruct the scrambled NP *caki/pro sensayngnim-lul* 'his teacher' into the trace position at LF, (13b) is predicted to have the same judgement as (13a) by the same reason as in (12). However, this prediction is not born out since (13b) is much worse than (13a). This observation casts some doubts on the assumption that variable binding in Korean (and perhaps in Japanese too) can be accounted for by move-α and LF reconstruction. See chapter 3 for our own account for

variable binding in Korean.

A similar system is developed by Fukui (1986) and Speas (1990). According to Fukui (1986), Japanese does not have specifier categories that have the property of "closing off" a projection of a lexical category (N or V), and thus a projection is always "open" in the sense that it is always possible to add another category to a phrase from outside, as long as interpretation is possible. On this approach, a subject in Japanese is within a projection of V. Fukui (1986) assumes tree structures to be strictly binary branching, based on how θ-roles are discharged. Thus, following Higginbotham's θ-criterion,[3] he assumes that the discharge of θ-roles takes place sequentially from right to left and one by one. Here, scrambling takes place within a projection of V, substituting a constituent into a base-generated position. For example, scrambling given in (7b) is accounted for by substitution of the NP object into the base-generated position occupied by an empty category, as illustrated in (14):

---

[3]Higginbotham's (1985) θ-criterion is as follows:

(i)   a.   Every thematic position is discharged.
        b.   If X discharges a thematic role in Y, then it discharges only one.

(14)

↓ move-α and substitution
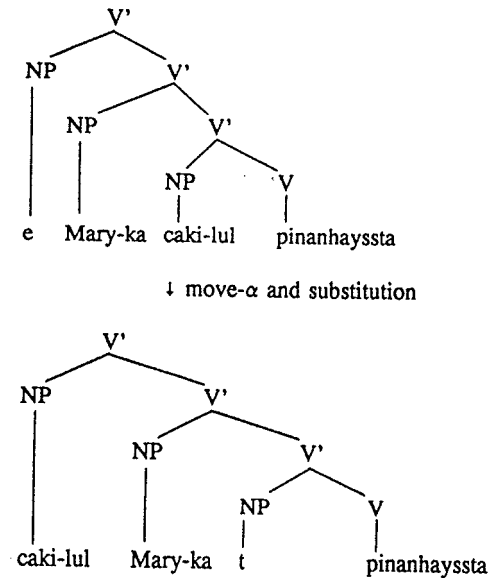
This approach inherits Saito's (1985, 1992) problems pointed out above. For example, positing binary branching and "open" projections of a lexical category themselves do not help improve accounts of variable binding mentioned above, as long as the notions of c-command and LF reconstruction are still assumed to be responsible for binding theories in Korean.

We also do not want to assume the binary branching syntactic structure as in (14) because binary branching structures do not represent traditional constituent structures. That is, each node in a tree like (14) cannot be considered as a real syntactic constituent since the structure does not show how constituents are combined to form another constituent, but basically shows how thematic roles of a verb are discharged. In other

words, the binary branching structure may be considered to be a more "abstract" level of representation (pseudo-semantic level of representation) such as the functor and argument structure in Categorial Grammar, where the dominance relation is not considered as a syntactically relevant relation.

1.1.3. Type Raising

In order to account for the freedom of word order in Korean within the Categorial Grammar framework, Kang (1988) assumes any expression can be type raised.[4] Also he assumes that in Korean, functional composition (FC) does not observe the Principle of Directionality (Steedman 1987) but does observe the Principle of Directional Inheritance (Steedman 1987).[5] According to Kang, some derivations of (15) are as in (16):[6] [7]

---

[4]In Kang (1988), "category lifting" is distinguished from "type lifting", but here we use the more general term, "type raising" since the distinction is unimportant for the purpose of the current discussion.

[5] (i) Principle of Directionality:
   The application of all combinatory rules must be consistent with the directionality of the principal function.

(ii) Principle of Directional Inheritance:
   In case of functional composition of mixing slashes, the direction of the non-principal function is inherited to the composed function.

[6]The examples in (15b,c) are allowed in colloquial style, as instances of so-called afterthought expressions, where arguments of a verb occur after the verb. See section 4.4.3.1 of chapter 4 for discussion of afterthought expressions.

[7]The sentences in (15b,c) are acceptable when they are considered as afterthought expressions. See chapter 4 for more discussion of afterthought expressions.

(15) a. {Mary-ka, John-hanthey,   sakwa-lul} cwuessta.
          M-Nom   J-to   apple-Acc gave
          'Mary gave an apple to John.'

      b. * cwuessta Mary-ka   John-hanthey sakwa-lul.
             gave   M-Nom   J-to   apple-Acc

      c. * Mary-ka John-hanthey cwuessta   sakwa-lul.
             M-Nom   J-to   gave   apple-Acc

(16) a. Mary-ka   John-hanthey   sakwa-lul   cwuessta
          s/vp   vp/tv   tv/ttv   ttv
          -----------------FC
              s/tv
          --------------------------------FC
                        s/ttv
                        --------------------------------FA
                             s

      b. Mary-ka   sakwa-lul   John-hanthey   cwuessta
          s/vp   tv/ttv   vp/tv   ttv
                                    ---------------FC
                                       vp/ttv
                      ---------------------------FC
                             s/ttv
          -----------------------------------FA
                  s

      c. Sakwa-lul   John-hanthey   Mary-ka   cwuessta
          tv/ttv   vp/tv   s/vp   ttv
          -----------------FC
             vp/ttv
          -------------------------------FC
                       s/ttv
                       ---------------------------------FA
                                      s

      d. * cwuessta   Mary-ka   John-hanthey   sakwa-lul
             ttv   s/vp   vp/tv   tv/ttv
                                     ---------------------FC
                                          s/tv
                         ----------------------------FC
                                 s/ttv
             -----------------------------?

      e. * Mary-ka   John-hanthey   cwuessta   sakwa-acc
             s/vp   vp/tv   ttv   tv/ttv
             -----------------FC   -----------------?
                 s/tv
                 --------------------------------?

In (16b), the first FC is legal since on this approach, the argument can come either to the

right or to the left of the functor when they combine by FC. The FC's in (16c) work in the same way. (16d) is ungrammatical since "ttv" and "s/ttv" cannot combine, i.e., functional application (FA) should still observe the Principle of Directionality. The ungrammaticality of (16e) is also predicted for the same reason. From these observations, we may say that type-raising approach correctly predicts all the well-formed and ill-formed simplex sentences.

However, Kang's system seems not to work when slightly more complicated sentences are considered which contain an embedded VP for example. Consider the following sentences:

(17) Mary-ka   John-hanthey [vp   ku chayk-ul   ilkulako]   seltukhayssta.
      M-Nom   J-to   the book-Acc read   persuaded
      'Mary persuaded John to read the book.'

For this sentence, the following word order variations are possible.

(18) a. {Mary-ka,   John-hanthey,   ku chayk-ul} ilkulako seltukhayssta.
         M-Nom   J-to   the book-Acc read   persuaded
         'Mary persuaded John to read the book.'

      b. Ku chayk-ul ilkulako   {Mary-ka,   John-hanthey}   seltukhayssta.
         the book-Acc read   M-Nom   J-to   persuaded

      c. {John-hanthey,   ku chayk-ul} ilkulako Mary-ka   seltukhayssta.
         J-to   the book-Acc read   M-Nom   persuaded

      d. *{Mary-ka,   John-hanthey}   ilkulako ku chayk-ul   seltukhayssta.
         M-Nom   J-to   read   the book-Acc persuaded

---

      e. *Mary-ka   ilkulako   {ku chayk-ul,   John-hanthey}   seltukhayssta.
         M-Nom   read   the book-Acc   J-to   persuaded

Here, the generalization is as follows: any word order is permitted as long as the object (*ku chayk-ul* 'the book') of the embedded verb (*ilkulako* 'read') precedes the embedded verb, and the matrix verb (*seltukhayssta* 'persuaded') comes final. In Kang's system, the sentence which has the canonical word order can be licensed as in (19):

(19)   Mary-ka   John-hanthey   ku chayk-ul   ilkulako   seltukhayssta
        M-Nom   J-to   the book-Acc   read   persuaded
        s/vp   vp/tv   vp/tv   tv   tv\vp
                                    -------------------FA
                                              vp
                                    --------------------------------FA
                                                        tv
                            --FA
                                          vp
                    ------------------------------------FA
                          s

However, there is no way to license some of the scrambled sentences. One example is as follows:

(20) a. John-hanthey   ku chayk-ul   ilkulako   Mary-ka   seltukhayssta.
        J-to   the book-Acc   read   M-Nom   persuaded
        vp/tv   vp/tv   tv   s/vp   tv\vp
                        -------------------FA
                              vp
                        ----TR
                        vp\(vp/tv)
                        ------------------------------FA
                                vp

     b. John-hanthey   ku chayk-ul   ilkulako   Mary-ka   seltukhayssta.
        J-to   the book-Acc   read   M-Nom   persuaded
        vp/tv   vp/tv   tv   s/vp   tv\vp
                                       ------TR
                                       vp\(vp/tv)
                        -------------------------FA
                                vp

```
c.  John-hanthey    ku chayk-ul   ilkulako   Mary-ka   seltukhayssta.
    J-to            the book-Acc  read       M-Nom     persuaded
    vp/tv           vp/tv         tv         s/vp      tv\vp
                                  --------TR            --------TR
                          vp\(vp/tv)                tv\(tv/(tv\vp))
                ------------------------FC
                          vp
```

In (20a), the result of FA, "vp", cannot combine with a nominative NP (which is "s/vp") since FA still needs to observe the Principle of Directionality to eliminate other ill-formed sentences. In (20b,c), even the verb is type-raised, the sentence still cannot be licensed.

Also note that this approach does not seem to have any way to derive both types of scrambling (clause-internal and long-distance scrambling) via the same type-raising mechanism.

From this, we may conclude that the type raising approach to free word order in Korean is untenable since there is no way to license all possible word order of a VP-embedding sentence.

1.1.4. ID/LP Format and Liberation

Another type of approach to word order variations has been developed within the framework of Generalized Phrase Structure Grammar (GPSG; Gazdar, Klein, Pullum and Sag (1985), GKPS (1985) henceforth). A traditional phrase structure rule specifies two distinct relations with one rule, i.e., immediate dominance (ID) relations holding between a mother category and its immediate daughter categories, and linear precedence (LP) relations holding among daughter categories. Following Gazdar and Pullum (1982),

however, GKPS (1985) separate these two relations by adopting the ID/LP format.[8] For example, the scrambling shown in (7) may be accounted for by assuming the following grammar in ID/LP format:

(21) a. S → NP[*nom*], NP[*acc*], H

     b. XP ≺ H

The ID rule in (21a) specifies that an S immediately dominates two NPs with nominative and accusative case, respectively, and a head which is a verb in this case. The LP constraint in (21b) specifies that a head linearly follows any other categories. Note that this LP constraint does not specify linear order between the two NPs. Thus, scrambling between the NPs, shown in (7), results from the lack of such a specification.

We can say that the ID/LP format mentioned above accounts for intra-constituent word order freedom. Another mechanism has been suggested to account for inter-constituent word order freedom, a liberation metarule or liberation principle (Pullum (1982), Zwicky (1986), and Kuh (1988), among others). For example, we may account for long-distance scrambling shown in (18) with a liberation metarule, roughly formulated

---

[8]Dowty (1990) points out that the history of separation of ID relations from LP relations goes back to Curry (1963) who distinguished tecto-grammatical structure from pheno-grammatical structure. The former structure concerns how a sentence is built up from its parts, whereas the latter structure concerns in what surface order, words and phrases are combined, whether word order is free or fixed, etc.

as in (22):[9]

(22)   { S → X, VP[F], H } → { S → X, Y, V[F], H }

(22) says that for a set of ID rules allowing an S to immediately dominate a VP with a certain feature F, there is another set of ID rules that allow an S to dominate a verb with the same feature, V[F], and some category or categories Y. Here Y is supposed to stand for the constituent(s) that is (are) directly governed by V[F]. In other words, the VP node of the VP complement, indicated by VP[F], is eliminated, liberating the argument(s) Y directly governed by the embedded verb V[F] out of the VP node. This entails in turn that in an output ID rule, the argument(s) X governed by the matrix head verb H, the argument(s) Y directly governed by V[F], and the verbs V[F] and H are all sisters to each other, which are immediately dominated by S.

A problem with the liberation mechanism formulated in (22) is that it cannot capture a constraint on scrambling, namely the fact that an argument of the embedded verb must precede the verb. (E.g., (18d) is unacceptable because the object (*ku chayk-ul* 'the book') of the embedded verb (*ilkulako* 'read') linearly follows the verb.) That is, even though we just assume Y to be an argument of V[F] in an output ID rule, nothing

---

[9]The long-distance scrambling shown in (18) may be considered to be licensed by the SLASH percolation mechanism (A-bar movement in GB). As mentioned in section 1.1.1, however, there seem to be some evidence that long-distance scrambling is indistinguishable from clause-internal scrambling. Thus, a problem with the accounts of long-distance scrambling via the SLASH mechanism is again that it cannot uniformly account for both types of scrambling.

guarantees the government relation to hold. One way to capture this relation in this system is to assume that each expression carries an index which represents a governor-governee dependency, and that this index is available in describing an LP constraint, i.e., the governor-governee dependencies are represented by the same index. Under such an assumption, we may have an LP constraint in (23):

(23) $Y_i \prec V_i$

(23) says that Y_i governed by a verb V_i precedes the verb, where the index i is used to represent prior constituency relations among the expressions in a flattened or liberated structure. However, this line of approach cannot avoid the criticism that the usage of the index in (23) is *ad-hoc* because it is used just to specify the government relation without any other independent linguistic motivation.

A more serious problem with this approach is that it cannot account for constraints on scrambling possibilities due to case marking. For example, in the control verb construction, an accusative NP argument of an embedded verb cannot scramble with the controller when they have the same marker, as shown in (24b).

(24)   a. Nay-ka Mary-lul [_VP ku sakwa-lul   mekkey] mantulessta.
          I-Nom M-Acc   the apple-Acc   eat   made

'I made Mary eat the apple.'

   b. * Nay-ka ku sakwa-lul   Mary-lul   mekkey mantulessta.
         I-Nom   the apple-Acc   M-Acc   eat   made

To account for this fact, Kuno (1980) proposes the following constraint on processing that avoids the possibility of ambiguous interpretations.[10]

(25)   In general, the greater the likelihood of ambiguous interpretation, the more difficult it is to switch the word order of two NP's marked with the same grammatical formative.

The constraint in (25) is not available in the current theory in any case simply because there is no mechanism corresponding to the notion of "switching" order, i.e., the sentences in (24b) are licensed in a flat structure, where NPs and verbs in the sentence are all sisters to each other. Thus, the order of the controller NP and the object NP of the embedded verb is basically free, and there is no natural way to impose an LP constraint on them.

Another problem is that this approach has never made serious proposals on binding theories and the effects of scrambling on them.

Before we sketch our own proposals, we will introduce some basic tools of Head-Driven Phrase Structure Grammar (Pollard and Sag (1994)) that will be utilized in this thesis.

---

[10] In section 4.3 of chapter 4, we propose that the ungrammaticality of (24b) results not from a violation of this kind of processing factor but from a violation of a syntactic constraint which has the same effect as (25). See section 4.3 for the motivation. Here, we use Kuno's constraint because the theory in question is problematic anyway, no matter which constraint is used.

1.2. Theoretical Framework: Head-Driven Phrase Structure Grammar

Most of this section is a rough summary of Pollard and Sag (1994), except subsection 1.2.4. In this summary, we try to avoid unnecessary technical details, referring readers to Pollard and Sag (1987, 1994) for philosophical background of the theory and precise formal definitions of feature structures in general. Here we will focus on feature structures of lexical entries, ID schemata, lexical rules, and various principles responsible for information sharing among different feature structures. We will also introduce a revision of the current case assignment system and incorporate the notion of the thematic hierarchy into the current framework.

1.2.1. Sorted Feature Structures and Lexical Entries

In HPSG, a linguistic object is represented by sorted feature structure, and a sort symbol indicates the sort of a sorted feature structure. For example, the basic linguistic object is of sort *sign*. A feature structure of sort *sign* has attributes such as PHON(OLOGY) and SYN(TAX &)SEM(ANTICS):[11]

---

[11] In Pollard and Sag (1994), the structure of *sign* has two more attributes such as QSTORE and RETRIEVED which are used to account for quantifier scopes. We do not include these because quantifier scopes are not our major concern in this thesis. However, see section 2.1.7.2 for a brief discussion of the QSTROE and RETRIVED attributes.

(26)
```
       +-                        -+
       | PHON     list(phonstring) |
       | SYNSEM   synsem           |
  sign +-                        -+
```

The convention is that a sort symbol is written in italics, while an attribute is written in capitals. As shown in (26), each attribute takes a feature structure of a specific sort as its value, i.e., PHON takes *list(phonstring)* and SYNSEM takes *synsem*. Here *list(phonstring)* indicates a list of phonetic strings (sounds), and *synsem* has hte attributes, LOC(AL) and NONLOC(AL):

(27)
```
          +-                      -+
          | LOC      local          |
          | NONLOC   nonlocal        |
  synsem  +-                      -+
```

A structure of sort *local* in turn has the attributes CAT(EGORY), CONTENT and CONTEXT:

(28)
```
          +-                        -+
          | CAT       category        |
          | CONTENT   content         |
          | CONTEXT   context         |
   local  +-                        -+
```

A structure of sort *category* has the attributes HEAD and VAL(ENCE):[12]

---

[12]In Pollard and Sag (1994), *category* also has the MARKING attribute, which is used to specify markers such as complementizers and conjunctions. However, we will not discuss this further because it is not crucial to our discussion.

(29)
```
              +-                  -+
              | HEAD    head        |
              | VAL     valence      |
   category   +-                  -+
```

The sort *head* has subsorts such as *noun*, *verb*, *adjective*, *preposition*, etc. which represent parts of speech. The sort *verb* has the attribute VFORM whose value can be sort *fin(ite)*, *inf(initive)*, *base*, etc; the sort *noun* has the attribute CASE whose value can be sort *nom(inative)*, *acc(usative)*, etc. The other parts of speech also have their own characteristic attribute-value pairs.

A structure of sort *valence* has attributes SUBJ and COMPS:[13]

(30)
```
             +-                      -+
             | SUBJ      list(synsem)  |
             | COMPS     list(synsem)  |
   valence   +-                      -+
```

That is, SUBJ takes as its value a list of *synsem* object(s) which, if non-null, is the subject (or subjects) of the category. Similarly, COMPS takes as its value a list of *synsem* objects, which are complements of the category. Angled brackets < > are used to represent a list.

Let us return now to the sort *local* in (28). The sort *content* has subsorts such *parameterized state-of-affairs (psoa)* and *nom(inal)-object*. When the part of speech is a

---

[13]Following Borsely (1987), Pollard and Sag (1994, chapter 9) revise the subcategorization system. In the new version, the old SUBCAT feature is replaced by VALENCE, with value of sort *valence*. They also assume *valence* to have another attribute SP(ECIFIE)R, which is used to handle specifiers like a determiner or a possessive. SPR will be often omitted when it is not neccessary.

verb, the attribute CONTENT takes as its value *psoa*. A discussion of the CONTENT of a verbal category and the structure of *psoa* will be postponed to section 1.2.4.2, where the thematic role hierarchy is discussed.

When the part of speech is a noun, the CONTENT attribute takes a value of sort *nom-object*. Sort *nom-object* has attributes INDEX and RESTR(ICTION).

```
(31)                +-              -+
                    | INDEX   index  |
                    | RESTR   set(psoa) |
          nom-object +-              -+
```

The INDEX attribute takes sort *index*, which has attributes PERSON, NUMBER and GENDER, representing the agreement features of the noun. The RESTR attribute takes as its value sort *set(psoa)*, a set of *psoa*s, which serve to give restrictions on the referent referred to by the index. The sort *nom-object* has two subsorts *nonpronoun* (*npro*) and *pronoun* (*pron*), with the latter sort subdivided into subsorts *personal-pronoun* (*ppro*) and *anaphor* (*ana*). The three subsorts *npro*, *ppro*, and *ana* correspond roughly to R-expressions, pure pronominals, and pure anaphors in GB.

The structure of sort *context* in (28) has the attribute B(AC)KG(ROUND) which takes a value of sort *set(psoa)*.[14] The set of *psoa*s of BKG specifies information about presuppositions or conventional implicatures. Some examples of BKG are given in sections 2.1.2 and 2.1.8.3 in chapter 2.

---

[14]Pollard and Sag (1994) assume another attribute, CONTEXTUAL-INDEX, which specifies information about the circumstances of utterance, such as SPEAKER, ADDRESEE, and UTTERANCE-LOCATION.

In (27), the sort *nonlocal* has attributes TO-BIND and INHER(ITED), which take sort *nonlocal1*:

```
(32)            +-                      -+
                | TO-BIND    nonlocal1   |
                | INHER      nonlocal1   |
      nonlocal  +-                      -+
```

Sort *nonlocal1* has the attribute SLASH, among others, which is used to account for unbounded dependency phenomena.[15] The SLASH attribute takes *set(local)* as its value, i.e., a set of *local* objects. See the next sections for more discussion about how (32) and SLASH interact with other mechanisms to account for unbounded dependency phenomena.

Let us now consider a specific lexical entry. For example, the feature structure of the verb *bought* is as in (33). Here sort names are not specified when they are recoverable from context.

---

[15]Pollard and Sag (1994) posit two more attributes in *nonlocal1*, REL and QUE, which specify the value of a relativizer and a *wh*-operator, respectively.

(33)

```
+-                                                              -+
| PHON <bought>                                                 |
|        +-    +-    +-                              -+-+        |
| SYNSEM | LOC | CAT | HEAD verb [VFORM fin]          | | |      |
|        |     |     |     +-                     -+  | | |      |
|        |     |     | VAL | SUBJ <NP[nom]::[2]>  |   | | |      |
|        |     |     |     | COMPS <NP[acc]::[4]> |   | | |      |
|        |     |     |     +-                     -+  | | |      |
|        |     |     |     +-              -+          | | |      |
|        |     |     | CONT | RELN bought   |          | | |      |
|        |     |     |      | BUYER [2]      |          | | |      |
|        |     |     |      | BOUGHT [4]     |          | | |      |
|        |     +-    +-     +-             -+        -+  | |      |
|        |     +-      +-                  -+          | |      |
|        | NONLOC | TO-BIND | SLASH { } |              | |      |
|        |        | INHER   | SLASH {  } |             | |      |
|        |        +-                    -+             | |      |
| sign +-        +-      +-            -+            -0+-+       |
```
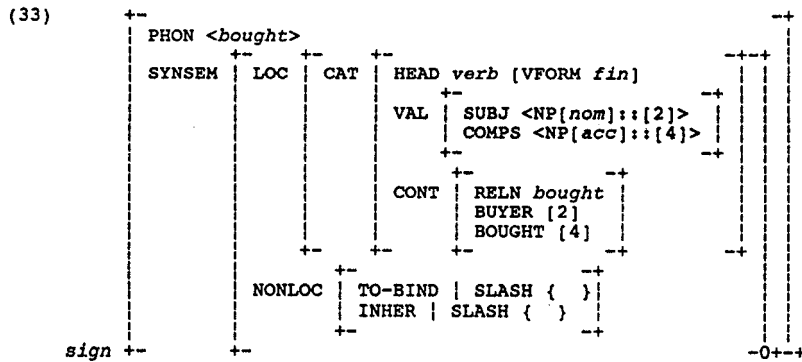
Here NP[nom]::[2] and NP[acc]::[4] are abbreviations for the AVMs in (34) and (35), respectively:

(34)

```
        +-    +-    +-                          -+-+-+
   [1]  | LOC | CAT | HEAD noun [CASE nom]       | | |
        |     |     |     +-              -+      | | |
        |     |     | VAL | SUBJ <  >       |     | | |
        |     |     |     | COMPS <  >      |     | | |
        |     |     |     | SPR <  >        |     | | |
        |     |     +-    +-              -+   -+  | |
        |     |     +-             -+          | |
        |     | CONT | INDEX [2] |             | |
        |     |      | RESTR [5] |             | |
        |     +-     +-         -+          -+  | |
        |     +-       +-          -+           | |
        | NONLOC | TO-BIND | SLASH { }|         | |
        |        | INHER   | SLASH { } |        | |
   synsem +-     +-                  -+       -+  |
```

(35)

```
        +-    +-    +-                          -+-+-+
   [3]  | LOC | CAT | HEAD noun [CASE acc]       | | |
        |     |     |     +-              -+      | | |
        |     |     | VAL | SUBJ <  >       |     | | |
        |     |     |     | COMPS <  >      |     | | |
        |     |     |     | SPR <  >        |     | | |
        |     |     +-    +-              -+   -+  | |
        |     |     +-             -+          | |
        |     | CONT | INDEX [4] |             | |
        |     |      | RESTR [6] |             | |
        |     +-     +-         -+          -+  | |
        |     +-       +-          -+           | |
        | NONLOC | TO-BIND | SLASH { }|         | |
        |        | INHER   | SLASH { } |        | |
   synsem +-     +-                  -+       -+
```
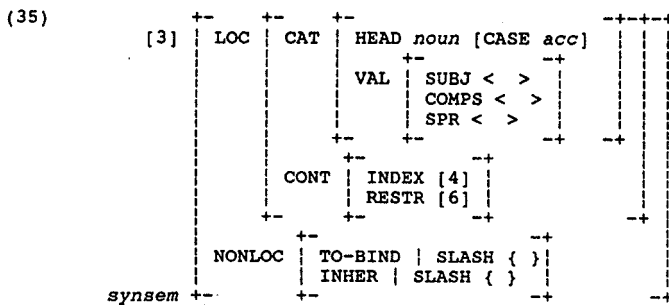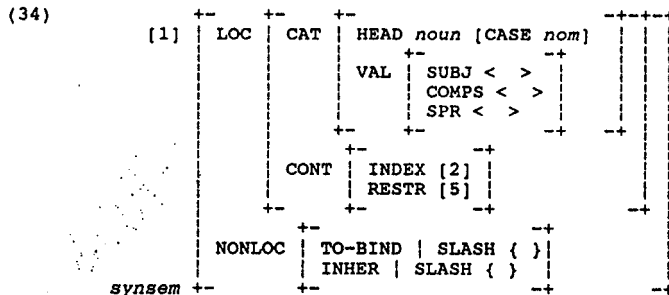
(33) indicates (i) that the verb form of *bought* is finite, (ii) that the verb takes a nominative NP as its subject and an accusative NP as its complement, and (iii) that the thematic roles of BUYER and BOUGHT are coindexed with the subject and the complement, respectively. Very often we will use an abbreviated feature description for expository convenience, e.g., NP[*nom*] and NP[*acc*]. One of the notational conventions that we will use throughout this thesis is that a tag after a double colon (::) represents the index of a constituent, as shown in (33), i.e., NP[*nom*]::[2].

The structure in (33) illustates the important concept of *structure-sharing* or *token-identity*. When the values of two different feature paths share the same structure as their common value, the value is said to be structure-shared by the two paths. In HPSG, such structure-sharing is represented by use of the same tag, e.g., the index [2] in the SUBJ list and BUYER.

Another crucial notion is the *subsumption* relation. In HPSG, sorts are hierarchically organized by sort subsumption relations from a less informative (or less specific) sort to a more informative (or more specific) sort. For example, the sort *sign* subsumes the more informative subsorts *word* and *phrase*. This subsumption relation can be represented by the graph in (36), where each node represents a sort.

(36)
```
                    sign
                   /    \
              word     phrase[DAUGHTERS]
```
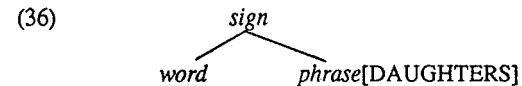
Here the supersort *sign* is divided into two subsorts *word* and *phrase*, which are more

specific than *sign*. Here, it is important to note that the attributes of a supersort are inherited to the subsorts. As mentioned above, sort *sign* has the attributes PHON and SYNSEM; thus *word* and *phrase* also have these attributes. Moreover, the subsort *phrase*, unlike *word*, also has the attribute D(AUGH)T(E)RS in addition to PHON and SYNSEM.

The attribute DTRS has sort *con(stituent)-stru(cture)*, which represents the immediate constituent structure of a phrase. One of the subsorts of *con-stru* is *head(ed)-stru* which is subdivided into several subsorts such as *h(ead)-s(ubject)-stru*, *h(ead)-c(omplement)-stru*, *h(ead)-a(djunct)-stru*, *h(ead)-f(iller)-stru*, etc, depending on the grammatical function of the nonhead daughters. For example, the structure of the *h-s-stru* has attributes HEAD-DTR and SUBJ-DTR:

```
(37)              +-                     -+
                  | HEAD-DTR    sign        |
                  | SUBJ-DTR    list(sign)  |
       h-s-stru +-                     -+
```
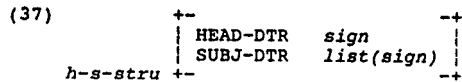
Thus, the sentence *Mary sneezed* has the feature structure in (38). Here numerous inessential details are omitted.

```
(38)        +-                                                    -+
            | PHON <Mary, sneezed>                                   |
            | SYNSEM S[fin]                                          |
            |         +-                          -+                 |
            | DTRS    | HEAD-DTR   | PHON <sneezed> |  -+ |
            |         |            | SYNSEM VP[fin] |     |          |
            |         |     phrase +-          -+   |     |          |
            |         |                             |     |          |
            |         |            +-          -+   |     |          |
            |         | SUBJ-DTR  ⟨ | PHON <Mary>  | ⟩  |          |
            |         |            | SYNSEM NP[nom] |     |          |
            |         |     phrase +-          -+   |     |          |
            +- h-s-stru +-                          -+-+-+
```

In this thesis, to represent a structure like the one in (38), we will use a conventional tree diagram as in (39) for the sake of familiarity:

(39)
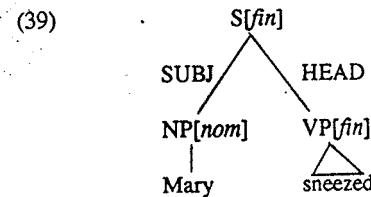
1.2.2. Projection of a Lexical Entry: ID Schemata, Principles and LP Constraints

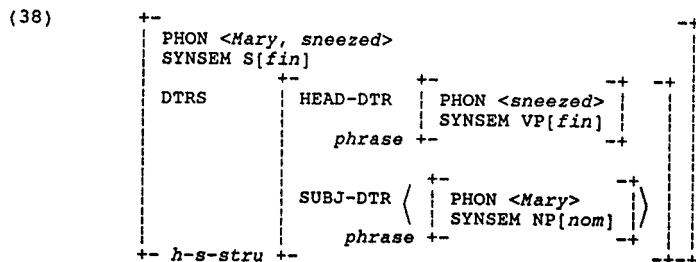In HPSG, highly schematic immediate dominance rules called ID schemata replace the numerous ID rules of GPSG, thank to the "lexicalization of grammar". They license local phrase structure trees of immediate constituency. The schemata can be considered as general constraint on projection of a lexical entry, allowing only certain patterns of projections from a lexical entry. For English, Pollard and Sag (1994) assume the following ID schemata:[16]

```
(40)    a.  Head-Subject Schema:
            X"[SUBJ < >]  →  [1]Y",     X"[SUBJ <[1]>]
                                SUBJ      HEAD

        b.  Head-Complement Schema:
            X"[SUBJ <[1]>]  →  [2],      X[COMPS [2]]
                                COMPS     HEAD
```

---

[16]The list of schemata in (40) is not intended to be exhaustive.

c. Head-Subject-Complement-Schema:

```
X"[SUBJ < >]  →  X[SUBJ <[1]>, COMPS[2]],  [1]Y",     [2]
                 HEAD                        SUBJ       COMPS
```

d. Head-Adjunct Schema:

```
XP  →  Y"[MOD [3]],   [3]XP
       ADJUNCT        HEAD       .
```

e. Head-Filler Schema:

```
                                +-                        -+
X"[SUBJ < >] → Y"[LOC[1]],  S[fin]|TO-BIND|SLASH {[1]}    |
                                  |INHER|SLASH {[1],....}|
                                +-                        -+
              FILLER                      HEAD
```

The Head-Subject Schema in (40a) states that a phrasal head combines with a subject to make a "fully saturated" phrase. Here a fully saturated phrase is one with an empty SUBJ list, i.e., [SUBJ < >]. The Head-Complement Schema in (40b) states that a lexical head combines with complement daughter constituents to make an "almost saturated" phrase. Here an almost saturated phrase is a phrase whose SUBJ list is nonempty but whose COMPS list is empty. Note that [2] in (40b) represents a whole list, so that it can represent more than one constituent.

The schemata in (40a) and (40b) can license a sentence like *she gave him a book* as in (41):

(41)
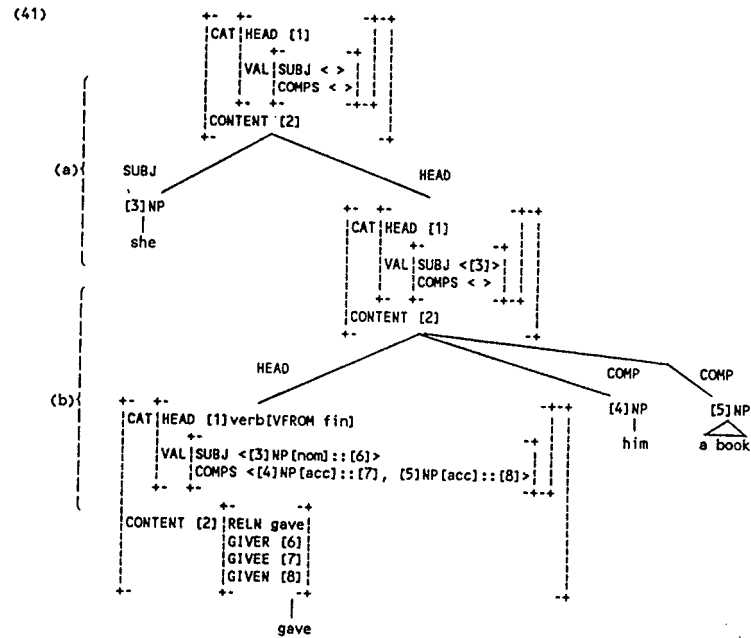
In (41), the local trees (a) and (b) are licensed by the Head-Subject Schema and Head-Complement Schema, respectively. It is important to be aware that licensing of (41) involves three universal principles:

(42) Head Feature Principle (HFP):

The HEAD value of any headed phrase is structure-shared with the HEAD value of the head daughter.

(43)   Valence Principle:

In a headed phrase, for each valence feature F, the F value of the head daughter

is the concatenation of the phrase's F value with the list of SYNSEM values of

the F-DTRS value.

(44)   Semantics Principle (preliminary version)

The CONTENT value of a phrase is token-identical to that of the head daughter.

By the HFP, the value of the HEAD feature in the lexical head in local tree (b)

in (41), represented by [1], is structure-shared with that of the mother node. The same

structure-sharing is represented in local tree (a).

By the Valence Principle, discharge of the elements in the COMPS and SUBJ lists

is guaranteed. That is, (43) can be paraphrased as follows: in a local tree, the *valence*

value of the mother node must be the *valence* value of the head daughter minus the

relevant nonhead daughters SYNSEM value(s), which is (are) called the "discharged"

element(s) from the valence list. Thus, in the local tree (b) in (41), the mother node's
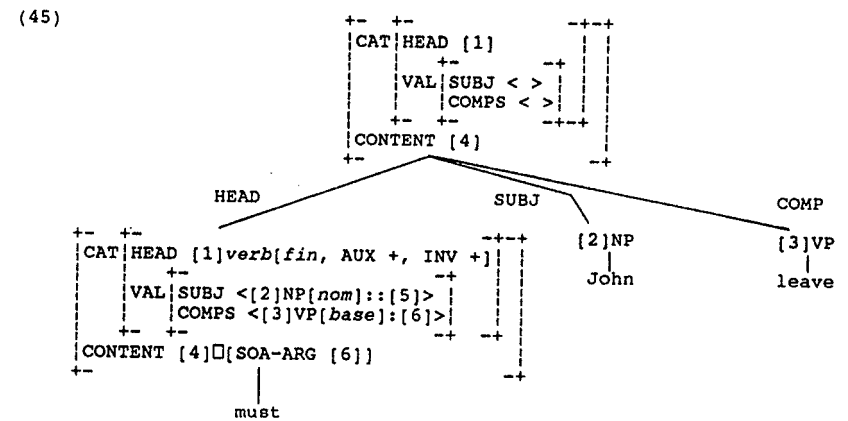
COMPS list is guaranteed to be empty since all elements (i.e., [4]NP and [5]NP) in the

COMPS list are discharged, while its SUBJ list is guaranteed to be the same as that of

head daughter. In the local tree (a), the mother node's SUBJ list must be empty since the

element of the SUBJ list (i.e., [3]NP) is discharged.

The Semantics Principle guarantees that the CONTENT value of the lexical head

daughter, represented by [2], is structure-shared with the mother nodes in local trees (b)

and (a).

The Head-Subject-Complement Schema in (40c) states that a lexical head

combines with the subject and complements simultaneously to form a fully saturated

phrase. This schema licenses an inverted sentence like *must John leave*:

```
(45)                              +-  +-              -+-+
                                  |CAT|HEAD [1]        | | |
                                  |   |   +-        -+ | |
                                  |   |VAL|SUBJ < > |  | |
                                  |   |   |COMPS < >|  | |
                                  |   +-  +-        -+-+ |
                                  |CONTENT [4]           |
                                  +-                    -+
              HEAD                                  SUBJ                COMP
  +-  +-                              -+-+     [2]NP              [3]VP
  |CAT|HEAD [1]verb[fin, AUX +, INV +]| | |      |                 |
  |   |   +-                       -+ | |      John              leave
  |   |VAL|SUBJ <[2]NP[nom]::[5]>  |  | |
  |   |   |COMPS <[3]VP[base]:[6]>|  | |
  |   +-  +-                      -+ -+ |
  |CONTENT [4]□[SOA-ARG [6]]            |
  +-                                   -+
                   |
                 must
```

In (45), the subject [2]NP and the complement [3]VP are discharged simultaneously.

Here the tag after a colon (:) stands for the CONTENT value of the constituent. We will

keep using this notational convention in this thesis.

Following the analysis of adjuncts in Categorial Grammar (CG), Pollard and Sag

(1994) posit that an adjunct selects the head that is modified by the adjunct, i.e., in terms

of Categorial Grammar, an adjunct is a functor, and the modified category is an

argument. The modified category is selected by one of the HEAD features, MOD, which

is specified in an adjunct daughter. The Head-Adjunct schema in (40d) states that an

adjunct combines with a phrasal head that the adjunct selects the modified phrase through the MOD feature. Note that even though an adjunct selects the modified category, the adjunct cannot be the syntactic head of the whole phrase, since the category of the mother node must be the same one as the modified category. However, the adjunct is considered as a semantic head, which makes it possible to naturally account for the semantic contribution of an adjunct to the whole phrase, i.e., the CONTENT value of an adjunct daughter is structure-shared with that of the mother node. To this end, the Semantics Principle in (44) is revised into (46):[17]

(46)   Semantics Principle: (revised version)

    In a headed phrase, the CONTENT value is token-identical to that of the adjunct daughter if the DRTS value is of sort *head-adjunct-structure*, and to that of the head daughter otherwise.

(46) states that in a local tree, the CONTENT value of the mother node is structure-shared with that of the head daughter except when the local tree consists of a head daughter and an adjunct daughter. In the latter case, the CONTENT value of the mother node is structure-shared with that of the adjunct daughter. On these accounts, an N' like *red apple* is licensed as follows:

---

[17]The Semantics Principle formulated here is still a simplified version (the secondary version in Pollard and Sag (1994)). It must be made more complicated to handle quantifier scopes. However, we use the simplified version since quantifier scopes are not our main concern in this thesis.

(47)
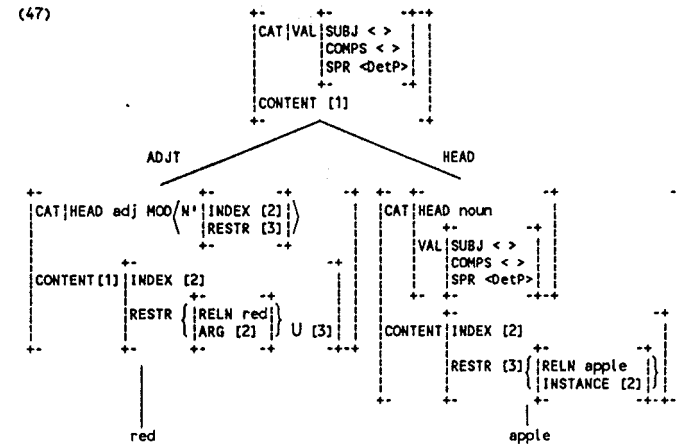
Here, the value of CONTENT [1] roughly says that *red apple* is something which is red and an apple.

The Head-Filler Schema in (40e) will be discussed in the next section since the construction involves another mechanism, namely lexical rules.

As in GPSG, the ID schemata in HPSG (e.g., (40)) do not carry any information about linear order among the sisters. Linear order is determined by separately stated LP constraints. For example, to determine linear order in (41), we may need at least the following LP constraints for English:

(48)   [1] < [SUBJ <[1]>]

(49)   COMPLEMENT < < COMPLEMENT   (Pollard and Sag (1987:174))

(48) states that a subject must precede the category that governs it. In local tree (a) in (41), the subject daughter must linearly precede the VP head daughter due to this LP constraint.

In (49), the symbol " < < " indicates a specially restricted LP constraint which has its effect only when the left-hand element is less oblique than the right-hand element. Thus, (49) amounts to saying that any complement daughter must linearly precede any sister which is a more oblique complement. The obliqueness hierarchy for English is as in (50), which says that a subject is less oblique than a primary object is less oblique than a secondary object, and so on.

(50)   Subject < Primary Object < Secondary Object < Obliques < ...

A convention is that in a valence list, a less oblique element comes to the left of a more oblique element. According to this convention, the COMPS list of the head daughter in local tree (b) in (41) indicates that [4]NP is less oblique than [5]NP, and thus, [4]NP must linearly precede [5]NP (Sag (1987)).

1.2.3. Lexical Rules

The basic idea underlying lexical rules in HPSG corresponds to the idea of traditional lexical redundancy rules, which may be considered as functions that map a set of words to another set. Given the lexical rules, the structure of an output entry is predictable from

an input entry, because specific information in both sets of words is related systematically.

A typical example of lexical rule is the English passive lexical rule in (51):

```
(51) +- +-                    -+      +- +-                         -+
     |CAT|HEAD verb VFORM base  |      |CAT|HEAD verb VFORM psp        |
     |   | +-              -+   |  --  |   | +-               -+       |
     |   |VAL|SUBJ <NP::[1]>|   |      |   |VAL|SUBJ <NP::[2]>|        |
     |   |   |COMPS <NP::[2],...>|      |   |   |COMPS <...(,PP[by]::[1])|
     |   +- +-             -+   |      |   +- +-              -+       |
     |CONTENT [3]               |      |CONTENT [3]                    |
     +-                       -+      +-                            -+
```

In (51), the input entry is a base form of a verb which takes at least one NP as its complement, represented by NP::[2] in (51). In the output entry, the subject of the input entry, NP::[1], is eliminated from the SUBJ list, and its index is reassigned to the optional complement PP[*by*], while the NP complement of the input entry takes place in the SUBJ list of the output entry. The CONTENT value of the input entry is carried over to the output entry without any change.

For example, the passive form *eaten* has the structure of the output entry in (52):

```
(52) +- +-                 -+      +- +-                        -+
     |CAT|HEAD verb VFORM base|      |CAT|HEAD verb VFORM psp       |
     |   | +-           -+    |      |   | +-              -+       |
     |   |VAL|SUBJ <NP::[1]>| |  --→  |   |VAL|SUBJ <NP::[2]>|       |
     |   |   |COMPS <NP::[2]>| |      |   |   |COMPS <(PP[by]::[1])||
     |   +- +-          -+    |      |   +- +-             -+       |
     |            +-      -+   |      |            +-       -+       |
     |CONTENT [3]|RELN eat |   |      |CONTENT [3]|RELN eat  |       |
     |           |EATER [1]|   |      |           |EATER [1] |       |
     |           |EATEN [2]|   |      |           |EATEN [2] |       |
     +-          +-      -+ -+ +      +-          +-       -+ -+     +
```

The output entry states that the subject NP::[2] has the EATEN role, and that the

complement PP[*by*]::[1] has the EATER role.

Another example of a lexical rule is the complement extraction lexical rule (CELR) in (53), whose output entry plays a role in licensing unbounded dependency constructions (UDCs) such as English topicalization (Pollard and Sag (1994, chapter 9)):[18]

```
(53)      +-            +-                    -+-+
          |LOC|CAT|VAL|SUBJ [1]                | |
          |           |COMPS <...[2][LOC[3]]...> | |
          |           +-                      -+ |
          |NONLOC|INHER|SLASH [4]                |
          +-                                   -+

                            |
                            ↓

          +-            +-                    -+-+
          |LOC|CAT|VAL|SUBJ [1]                | |
          |           |COMPS <... ...>         | |
          |           +-                      -+ |
          |NONLOC|INHER|SLASH [4] ∪ {[2]}        |
          +-                                   -+
```
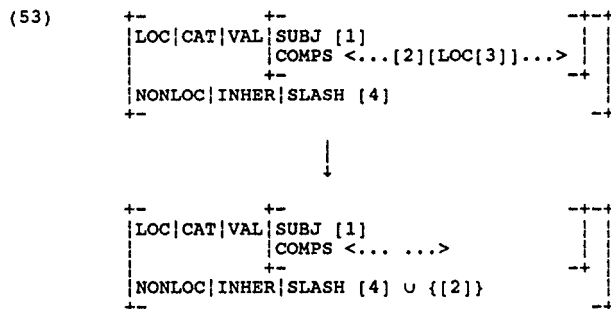
The CELR in (53) takes as input a lexical entry with a nonempty COMPS list and returns a lexical entry that is just the same except that one element has been removed from the COMPS list and placed within the INHER|SLASH value. The INHER|SLASH attri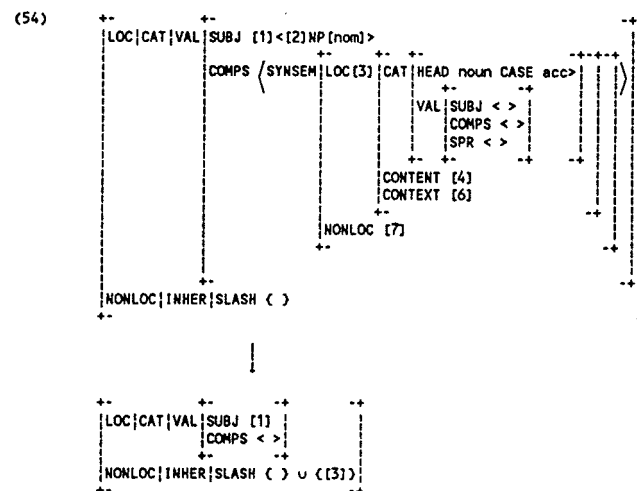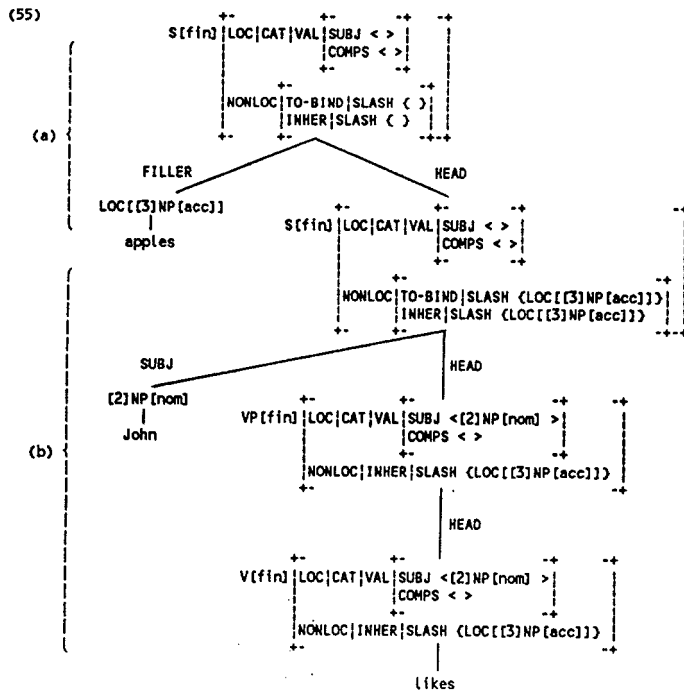bute takes as its value a set of *local* feature structures of missing constituents, i.e., LOCAL values of extracted constituents, not of the whole SYNSEM structures. For example, the verb *likes* in a topicalization sentence like *apples, John likes* ___ has the structure of the

---

[18]Two alternative kinds of UDC analyses are proposed in Pollard and Sag (1994): one is the trace analysis where a trace is assumed in a gap position, while the other is the traceless analysis where no trace is assumed. The lexical rule in (50) follows latter approach.

output entry in (54), which is projected as in (55) to form a fully saturated sentence. In (55), the LOCAL value [3] in (54) is abbreviated into NP[*acc*].

```
(54)    +-          +-                                          -+-+
        |LOC|CAT|VAL|SUBJ [1]<[2]NP[nom]>                        | |
        |           |          +-     +- +-              -+-+-+  | |
        |           |COMPS /SYNSEM|LOC[3]|CAT|HEAD noun CASE acc>| | |
        |           |       \      |      |   +-         -+    | | | |
        |           |              |      |VAL|SUBJ < >   |    | | | |
        |           |              |      |   |COMPS < >  |    | | | |
        |           |              |      |   |SPR < >    |    | | | |
        |           |              |      +- +-         -+ -+  -+ | |
        |           |              |CONTENT [4]                   | |
        |           |              |CONTEXT [6]                    -+ |
        |           |              +-                             -+  |
        |           |HONLOC [7]                                     | |
        |           +-                                             -+ |
        |NONLOC|INHER|SLASH ( )                                       |
        +-                                                         -+

                            |
                            ↓

        +-          +-       -+              -+
        |LOC|CAT|VAL|SUBJ [1] |                |
        |           |COMPS < >|                |
        |           +-       -+                |
        |NONLOC|INHER|SLASH ( ) ∪ ([3])|
        +-                             -+
```

(55)

```
                    +-          +-   -+    -+
            S[fin] |LOC|CAT|VAL|SUBJ < >  |   |
                   |           |COMPS < > |   |
                   |           +-        -+   |
                   |   +-                  -+ |
                   |NONLOC|TO-BIND|SLASH ( )| |
  (a)              |      |INHER|SLASH ( )  | |
                   +-     +-                -+-+
              FILLER  ___/\___  HEAD
             LOC[[3]NP[acc]]   +-          +-        -+       -+
                |      S[fin] |LOC|CAT|VAL|SUBJ < >  |        |
              apples          |           |COMPS < > |        |
                              |           +-        -+        |
                              |   +-                       -+ |
                              |NONLOC|TO-BIND|SLASH <LOC[[3]NP[acc]]>| |
                              |      |INHER|SLASH <LOC[[3]NP[acc]]>  | |
                              +-     +-                      -+-+
                   SUBJ _____/\__  HEAD
                 [2]NP[nom]     +-          +-              -+   -+
                   |     VP[fin] |LOC|CAT|VAL|SUBJ <[2]NP[nom] >| |
  (b)            John           |           |COMPS < >         | |
                                |           +-                -+ |
                                |NONLOC|INHER|SLASH <LOC[[3]NP[acc]]> | |
                                +-                              -+
                                         |  HEAD
                               +-          +-              -+   -+
                        V[fin] |LOC|CAT|VAL|SUBJ <[2]NP[nom] >| |
                               |           |COMPS < >         | |
                               |           +-                -+ |
                               |NONLOC|INHER|SLASH <LOC[[3]NP[acc]]> |
                               +-                              -+
                                         |
                                       likes
```

Here, percolation of INHER|SLASH {LOC[[3]NP[*acc*]]} in the local trees in (b) is guaranteed by the Nonlocal Feature Principle (NFP) in (56):

(56)   Nonlocal Feature Principle: (NFP)

For each nonlocal feature, the INHERITED value on the mother is the union of the INHERITED value on the daughters minus the TO-BIND value on the head daughter.

Thus in the local tree (a), the percolated INHER|SLASH value is bound by the TO-BIND|SLASH value which is specified in the Head-Filler Schema in (40e) in section 1.2.2. The schema in (40e) states that a finite verbal category with empty valence value, i.e., S[*fin*], combines with a category whose LOC value is the same as some element of the TO-BIND|SLASH in the S. In other words, in the local tree (a), the INHER|SLASH value in the head daughter is guaranteed to be percolated up there by the NFP in (56), while the TO-BIND|SLASH value is specified there by the Head-Filler Schema. Then the percolation of the INHER|SLASH value stops there due to the NFP; i.e., the INHER|SLASH value must be empty since the TO-BIND value of the head daughter in this case is identical to the union of the INHER values on the daughters.

1.2.4. Some Extensions

In this section, we will discuss two issues. The first issue has to do with the case assignment system in Korean, which seems to be more complicated than the one discussed in Pollard and Sag (1994) for English. The second issue is how the thematic role hierarchy in general can be incorporated into the HPSG framework.

1.2.4.1. Case Principle

Pollard and Sag (1994) only discuss case assignment in English, where they assume that there is only one type of case assignment, namely so-called lexically assigned case.

However, a different approach is required for languages such as German and Korean, which have more complicated case systems. In this section, we will introduce a case assignment mechanism developed by Yoo (1993), which will be adopted in this thesis as a case assignment mechanism for Korean.[19]

Following Heinz and Matiasek (1994) and Pollard (1994), Yoo (1993) introduces the notion of *structural case* into HPSG to account for case assignment in Korean. The basic idea is that the case of some NPs is not lexically assigned, but just specified as [*str(uctural)*] in the lexicon and surfaces as either nominative or accusative depending on the syntactic context. The Case Principle for Korean proposed by Yoo is as in (57):

(57)   Case Principle:

A *structural* NP which is a daughter of a phrase α is [*nom*] if it is a SUBJ-DTR of α, and [*acc*] if it is a COMP-DTR of α.   (Yoo (1993):189)

The Case Principle in (57) states that if structural case is assigned to an NP, it is realized as nominative case or accusative case when the NP is a subject daughter or a complement daughter, respectively.

A difficulty with the view that case assignment in Korean can uniformly be accounted for only by lexical case arises when the controller's case assignment in the raising verb construction is considered. A relevant example is as follows:

---

[19]A similar case assignment mechanism is independently proposed in Ryu (1993) in the framework of HPSG.

(58)   Mary-ka   John-ul   [VP ttokttokha-ysstako]   sayngkakhanta.
        M-Nom   J-Acc   smart-Past   think
        'Mary thinks John to have been smart.'

To license the sentence, we may assume the following valence structure for the raising verb *sayngkakhata* 'think':

```
(59)    +-
        |SUBJ <[1]NP[nom]>                              -+
        |COMPS <[2]NP[acc], VP[fin, SUBJ <[2]>]>|
        +-                                              -+
```

If the structure in (59) is assumed to be correct, then, due to the structure-sharing between the controller [1]NP[*acc*] and the understood subject of the VP complement, we also need to assume that an accusative NP can be a subject of a finite verb. However, this assumption is not tenable because it will overgenerate unacceptable sentences like (60b):

(60)   a.   Mary-ka   ttokttokha-yssta.
              M-Nom   smart-Past

              'Mary was smart.'

        b. * Mary-lul   ttokttokha-yssta.
              M-Acc   smart-Past

However, once the notion of structural case is introduced, the case marking is naturally explained. In this analysis, the valence structure of the raising verb *sayngkakhata* 'think' is as in (61):

```
(61)      +-
          |SUBJ <[1]NP[str]>                          -+
          |COMPS <[2]NP[str], VP[fin, SUBJ <[2]>]>|
          +-                                        -+
```

In (61), the controller [2]NP[*str*] is one of the complement daughters, and thus it will be

realized as an accusative NP by the Case Principle.

Yoo (1993) also assumes another type of case, namely lexical case, to account for

some other idiosyncratic case marking phenomena. In Korean, certain verbs such as

(de)emotion verbs directly assign nominative or accusative case to an NP. In this special

case, the Case Principle in (57) is exempt. Let us consider the following emotion verb

construction as an example of lexical case:

(62) a. Nay-ka   sakwa-ka   cohta.
          I-Nom   apple-Nom   like

          'I like apples.'

      b. * Nay-ka   sakwa-lul   cohta.
            I-Nom   apple-Acc   like

The valence structure for the emotion verb *cohta* 'like' is as follows:

```
(63)      +-            -+
          | SUBJ <NP[str]> |
          | COMPS <NP[nom] |
          +-            -+
```

In (63), nominative case is directly assigned to the complement NP *sakwa* 'apple' by the

lexical entry, while structural case is assigned the subject NP *na* 'I' which is realized as
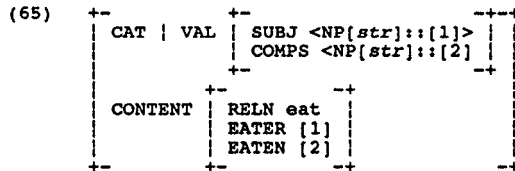
nominative case through the Case Principle.

1.2.4.2. Thematic Hierarchy

In current HPSG, the CONTENT attribute of a verbal category takes a value of sort

(possibly quantified) parameterized-state-of-affair (psoa), which is specified with two

attributes, QUANT(IFIERS) and NUCLEUS, as shown (64) below. The semantic roles

of arguments such as EATER and EATEN are specified within sort *qualifier-free psoa*

(qfpsoa) which is the value of the NUCLEUS attribute.

```
(64)            +-                                        -+
       CONTENT  | QUANT        (list of quantifiers)  |
                |                                        |
                | NUCLEUS      (qfpsoa)                  |
          psoa+-                                        -+
```

In HPSG, the structure of the CONTENT attribute of a verbal category is given as in

(64) to handle issues such as the scope of quantifiers. In this thesis, as mentioned already,

such issues are not main concerns, and thus to avoid unnecessary complexities, we will

ignore the QUANTIFIERS attribute, just assuming that semantic roles of arguments are

specified in the attribute of CONTENT. In other words, NUCLEUS will be assumed to

be the same as CONTENT from now on, for expository convenience. However, note that

every discussion about CONTENT is actually about NUCLEUS.

For example, the CAT(EGORY) and CONTENT values of the verb *eat* will be

represented as in (65) from now on.

```
(65)   +-           +-                 -+-+
       | CAT | VAL | SUBJ <NP[str]::[1]> | |
       |           | COMPS <NP[str]::[2]> | |
       |           +-                 -+  |
       |     +-           -+               |
       | CONTENT | RELN eat  |             |
       |         | EATER [1] |             |
       |         | EATEN [2] |             |
       +-        +-         -+           -+
```

Sharing of indices in (65) shows that the subject NP::[1] has the EATER role and the object NP::[2] has the EATEN role.

In many natural languages, including Korean and Japanese, it seems to be crucial to assume a thematic role hierarchy like (66), in order to account for some linguistic phenomena.

(66)   agent > beneficiary > recipient/experiencer > instrument > location > manner

> theme > patient   (Yatabe (1993): 33)

In this thesis, we need to assume a certain thematic role hierarchy at least to account for canonical word order and floated quantifiers (Yatabe (1993)).

A problem with the CONTENT structure in (65) is that there is no way to represent or incorporate a thematic role hierarchy like (66). That is, in HPSG, as shown in (65), the thematic roles (or semantic roles in terms of HPSG) of verbal arguments are not specified by "thematic role types" such as Agent, Patient, Theme, etc., but rather by "individual thematic roles" such as 'eater role' (EATER), 'eaten role' (EATEN), etc.,

which makes it impossible to directly utilize the thematic role hierarchy in (66).[20]

To resolve this problem, we may think of replacing all individual thematic roles with certain thematic role types. However, Pollard and Sag (1987, 1994) do not advocate this line of approach since there is no consensus as to what kind of thematic role types exist in natural languages and in many cases it is impossible to decide on a specific role type that must be assigned to a verbal argument. Then our question is narrowed down to whether it is possible to capture the concept of the thematic role hierarchy without using certain specific role types. An answer to this question seems to appear in Dowty (1991). Pointing out some problems of the traditional approaches to thematic role assignment, Dowty concludes (i) that it is empirically almost impossible to identify all verbal arguments by thematic role types such as Agent, Goal, etc.; (ii) that thematic role types are not discrete, but rather are continuous in that they are like elements in a spectrogram which has the Proto-Agent role at one extreme of the spectrogram and the Proto-Patient role at the other extreme; and (iii) that the thematic role hierarchy between the two proto-role types is best characterized in terms of the numbers of Proto-Agent and/or Proto-Patient entailments of each verbal argument. He provides (67) and (68) as preliminary lists of entailments that determine whether each argument is more like Proto-Agent or Proto-Patient with respect to the event indicated by the verb, with an acknowledgement that these lists are not necessarily exhaustive or that they might be better partitioned in some other way.

---

[20]The terms such as "thematic role types" and "individual thematic roles" are due to Dowty (1991).

(67)   Entailments of the Agent Proto-Role

    a. volitional involvement in the event or state

    b. sentience (and/or perception)

    c. causing an event or change of state in another participant

    d. movement (relative to the position of another participant)

(68)   Entailments of the Patient Proto-Role

    a. undergoes change of state

    b. incremental theme

    c. causally affected by another participant

    d. stationary relative to movement of another participant

For instance, let us consider the following sentence:

(69)   Mary sent a letter to John.

In the event of sending, the 'sender' *Mary* has two entailments of Proto-Agent (e.g. (67a,c)) and no entailments of Proto-Patient. The 'sendee' *(to) John* has one entailment of Proto-Patient (e.g. (68d)) and no entailment of Proto-Agent. The 'sent' *a letter* has one entailment of Proto-Agent (e.g. (67d)) and three entailments of Proto-Patient (e.g. (68a,b,c)). In this case, the number of Proto-Patient entailments outnumbers the Proto-Agent entailment by two. Thus, we can consider *(to) John* is more like Proto-Agent than *a letter*, and *Mary* is more like Proto-Agent than *(to) John*. From this, we can determine

the following thematic role hierarchy in terms of individual thematic roles, without using a thematic hierarchy as in (66).

(70)   SENDER > SENDEE > SENT

1.3. Proposals and Overview

Background ideas for the theory that will be proposed in this thesis are found in the theories discussed in sections 1.1.1 (dual representation theory) and 1.1.4 (ID/LP format and liberation). Our theory has a common property with the dual representation theory. For example, in our analysis, scrambling is basically accounted for by a flat constituent structure, while various binding facts are accounted for not by tree configurations but rather by interactions between linear order and *obliqueness-command* (*o-command*) which is induced from the structures of lexical entries. Once we posit that a lexical entry is a set of constraints on feature structures and that binding principles apply at the lexical structure, the binding principles formulated in tems of tree configurational notions such as c-command are not available any longer. (See sections 2.1.6 and 2.1.7 in chapter 2 and section 5.4 in chapter 5 for detailed discussions on binding principles.)

In our theory, the problems raised in section 1.1.1, mainly regarding formal properties of lexical structures, are no longer problems since we adopt lexical structures in HPSG which are organized in a highly formal manner. Also note that the mapping between LS and CS is not a problem either because in our theory, CS is a direct

projection from a lexical entry, being regulated by ID schemata and various principles.

Our proposal is also similar to the theory of ID/LP format and liberation in many respects, in that (i) we use LP constraints to give restrictions on scrambling; (ii) we assume no derivation or move-α, i.e., only one syntactic structure, namely the surface structure, is assumed to exist; (iii) in order to account for long-distance scrambling, we use a form of the notion of liberation, which is incorporated into relations between two sets of lexical entries (lexical rules). The notion of liberation is incorporated in these lexical rules in the sense that one of the functions of the lexical rules is to "liberate" the constituents within the complement VP or S constituent by eliminating the VP or S node. (See sections 4.4.1.1 and 4.4.2 for more discussion of the lexical rules.)

On this approach, all the problems discussed in section 1.1.4 are resolved thanks to the lexical structures in HPSG. Since it is impossible to illustrate in detail how our theory resolves all the problems in this introductory section, we just roughly outline the main ideas. The problem regarding the governor-governee relation in the LP constraint in a liberated structure (e.g., (23)) can be resolved since the relation can be naturally represented by structure sharing between the governee (argument) and the value of governing verb's valence list, as shown in the LP constraint in (48) in section 1.2.2.

The problem regarding case marking and its effect on scrambling in the control verb construction is also resolved since the controller and the embedded object can be identified by the subject and complement lists in the embedded verb structure; and thus we can straightforwardly state that the controller precedes the object when they have the same case marking. (See section 5.4.1.1 in chapter 5 for detailed discussion.)

As mentioned already, problems concerning binding principles also can be resolved by the binding principles based on the notion of o-command and linear order in a flat structure.

The overall organization of this thesis and main proposals of each chapter are as follows. Chapter 2 is mainly concerned with the debate on whether Korean clause structure is hierarchical or flat. Here we will review eight phenomena that have been claimed to provide crucial evidence for a hierarchical clause structure in Korean and Japanese, showing that they are really not problematic for a flat analysis. We will also argue for the flat structure based on the more general applicability of the mechanisms used in the flat analysis, compared with the mechanism used in the hierarchical analysis. In a flat structure, scrambling is due to the relative freedom of linear precedence constraints among the constituents at the clause level. Canonical word order and discourse restrictions on scrambling will be briefly sketched, based on the Principle of Information Flow.

In chapter 3, we will explore whether or not the auxiliary verb (AUX) construction in Korean is an instance of a verbal complex, which is one of the typical properties of nonconfigurational language. We will propose that the combination of an AUX and its selected verb form a complex word. In our approach, a mechanism called "argument attraction" which "attracts" the arguments of the governed verb to the argument list of the governing verb is crucial for accounts of this construction.[21] By

---

[21]Argument attraction is called "argument composition" in Hinrichs and Nakazawa (1991, 1994) and Categorial Grammar. The notion of "verb projection raising" in Haegeman and Riemsdijk (1986) is also a similar notion. However, see chapter 3 for

virtue of this mechanism, passivization and case alternation problems involved with the AUX construction are accounted for without any violation of standard locality assumptions.

In chapter 4, we will extend the theory of the auxiliary verb construction, proposing that the mechanism of argument attraction is also crucial for accounts of word order variation facts in complex clauses, i.e., the VP- or S-complement constructions. Even though, in chapter 2, we proposed that Korean does not have a VP node that makes the clausal structure hierarchical, it does not necessarily follow that Korean does not have a VP constituent at all. Rather, we suggest that Korean does not have a schema which says that an S consists of a subject and a predicate VP. Actually, we will show that verbs such as control or raising verbs subcategorize for a VP. In this case, we need to assume a VP constituent which is one of the complements of a particular lexical head and thus is a sister to the head. To account for scrambling in VP and S-complement constructions, we incorporate the liberation mechanism into the lexical rules. Roughly speaking, the lexical rule states that arguments of the governed verb are attracted to the complement list of the matrix verb, and that the matrix verb, its arguments, the complement verb, and its attracted arguments are all sisters. This approach to long-distance scrambling entails that clause internal scrambling is the same kind of syntactic phenomena as long-distance scrambling since both types of scrambling are uniformly licensed by flat structures. We will also investigate afterthought expressions and adjunct scrambling, which seem to be directly relevant to scrambling.

differences between argument attraction and verb projection raising.

In chapter 5, we will examine what theoretical predictions our theory can make. To this end, we will discuss four phenomena raised in previous studies of scrambling: i.e., long-distance passivization, weak crossover effects, licensing of negative polarity items, and long-distance anaphor binding. We will focus on the theoretical implications of these phenomena regarding scrambling in complex clauses and what predictions our theory makes with respect to them.

Chapter 6 is the conclusion of this thesis. Here we will summarize our main proposals and suggest some alternatives.

CHAPTER II

CLAUSE STRUCTURES IN KOREAN

Since Hale's (1980) discussion on configurational vs. nonconfigurational languages, analyses of sentence structure in Korean or Japanese have been widely debated: one position is to assume a flat structure in (1) (Hale (1980) and Farmer (1984), among others), while the other, more prevalent, position is to posit a hierarchical structure analysis in (2) (Choe (1985, 1989), Y.S. Kang (1985), Gunji (1986), Miyagawa (1989), Sells (1990), and Yatabe (1993), among others).

(1)　　　　S　　　　　　　(2)　　　　S

　　NP　NP　V　　　　　　　NP　　　VP

　　　　　　　　　　　　　　　　　NP　　V
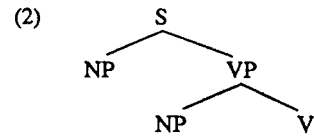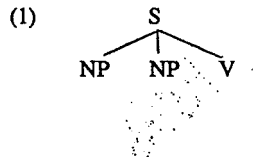
The prevalence of the assumption that Korean or Japanese has the hierarchical structure in (2) seems to be due largely to the influence of the Government Binding theory (GB) which tries to account for various linguistic phenomena in configurational terms. In this chapter, we will argue that this kind of approach to Korean clausal structure is undermotivated because it neither provides objective (or theory-independent) evidence

for the hierarchical structure at the clausal level nor fully accounts for the given phenomena such as anaphor binding and weak crossover effects. We will discuss evidence for flat over hierarchical structures from the perspective of phrase structure grammar augmented with feature structures, namely, Head-Driven Phrase Structure Grammar (HPSG) which was discussed in chapter 1.

The organization of this chapter is as follows. In section 2.1, we will discuss whether Korean clause structure is flat or hierarchical. Here, we critically review various constructions which are used as evidence for existence of the VP constituent in (2). In section, 2.2, we argue for the flat analysis, based on the more general applicability of the mechanisms used in the flat analysis, compared with the mechanisms used in the hierarchical analysis. In section 2.3, we briefly discuss canonical word order and discourse restrictions on non-canonical word order.

2.1. No Evidence for Hierarchical Structures

The purpose of this section is to show that none of the current arguments for hierarchical structure provides crucial evidence for this assumption. The putative VP constituent in (2) does not satisfy most of the major constituent tests, whereas all the constructions that are argued to be problematic without an assumption of the VP node in (2) turn out to be explainable without it. From now on in this chapter, a VP constituent or a VP node generally means the VP in configuration (2) which makes a clause structure hierarchical. When we discuss a different kind of VP constituent, which is subcategorized for by

control, raising and causative verbs, we will mention it specifically.

2.1.1. Coordination and Proform Tests

Gunji (1986) argues for the existence of the VP node through constituent tests involving coordinate constructions and the pro-form *soo-su* 'do so' in Japanese. However, these tests cannot provide direct evidence for the existence of the VP node. First, as shown in (3), it seems that any constituents (or words) in Korean can be conjoined as long as they are interpretable. If VP coordination in (3a) constituted evidence for VP constituency, there would be no reason why we could not say that the string consisting of a subject and a secondary object in (3b), and the string consisting of a subject, a primary object, and a secondary object in (3c), also form constituents. Yet these are standardly not considered to correspond to constituents.

(3)   a. Mary-ka [vp   Kim-hanthey sakwa-lul   cwuess-ko]
          M-Nom   K-to   apple-Acc   gave-and
          [vp Sandy-hanthey   banana-lul   cwuessta].
             S-to   banana-Acc gave
          'Mary gave Kim an apple and gave Sandy a banana.'

      b. [Mary-ka Kim-hanthey] kuliko [Sandy-ka   Sue-hanthey]
          M-Nom   K-to   and   S-Nom   S-to
          sakwa-lul cwuessta.
          apple-Acc gave
          'Mary and Sandy gave an apple to Kim and Sue, respectively.'

      c. [Mary-ka Kim-hanthey sakwa-lul]   kuliko [Sue-ka Sandy-hanthey
          M-Nom K-to   apple-Acc   and   S-Nom S-to
          banana-lul] cwuessta.
          banana-Acc gave
          'Lit. Mary and Sue gave an apple and a banana to Kim and Sandy, respectively.'

We do not pretend to have a good account of the coordination construction. What we suggest here is (i) that the assumption that only syntactic constituents can be coordinated becomes dubious when we consider examples like (3b,c),[1] and (ii) that we need a more general theory of coordination to show how the sentences in (3b,c) as well as (3a) are licensed. Without a more general and concrete theory of coordination, it is of no use to argue that the coordination test can be evidence for VP constituency in Korean.

We may consider (3b,c) as instances of the gapping or right node raising constructions where the NP *sakwa-lul* 'apple' and/or the verb *cwuessta* 'gave' are/is dislocated from each conjunct. If this kind of analysis is possible, however, we also can say that (3a) is an S coordination where the subject *Mary-ka* is dislocated from each S conjunct. In this analysis, each conjunct in (3a) does not necessarily form a VP constituent.

Pro-form substitution is not an appropriate constituent test for Korean either. In (4a), the string comprising a primary object, a secondary object, and a verb looks like a constituent (VP) and can be substituted by a pro-form, and hence gives the appearance

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[1]This phenomenon is called non-constituent coordination. B. Kang (1988) treats this construction in the framework of Generalized Categorial Grammar.

of a constituent. But if this were true, we could equally say that (4b) shows the string consisting of a primary object and a verb is a constituent, and similarly for the string in (4c) consisting of a subject, a secondary object and a verb because each can be substituted by a pro-form, again contrary to standard assumptions.

(4) a. Mary-ka   [Kim-hanthey *cencayng kwa pyunghwa*-lul pilyecwuess-ko],
         M-Nom   K-to   war and peace-Acc   lent-and
         Sandy-to   kulekeyhayssta.
         S-also   did-so
         'Mary lent Kim *war and peace*, and so did Sandy.'

     b. Mary-ka   Kim-hanthey [*cencayng kwa pyunghwa*-lul   pilyecwuess-ko],
         M-Nom   K-to   war and peace-Acc   lent-and
         Sandy-to Sue-hanthey   kulekeyhayss-ta.
         S-also   S-to   did-so
         'Mary lent Kim *war and peace*, and Sandy also did so to Sue.'

     c. Mary-ka   Kim-hanthey *cencyng kwa pyunghwa*-lul   pilyecwuess-ko,
         M-Nom   K-to   war and peace-Acc   lent-and
         (nacungey) *coy wa pel*-to   kulekeyhayssta.
         later   sin and punishment-also   did-so
         'Mary lent Kim *war and peace*, and (later) (she lent him) *sin and
         punishment*, too.'

2.1.2. Case Assignment

Choe (1985) and Y.S. Kang (1985), among others, argue that the assumption of a VP node is necessary to account for the assignment of case to subject and object NPs. For example, Korean has multiple nominative/accusative constructions as illustrated in (5).

(5) a. Khokkili-ka   kho-ka   kilta.
         elephant-Nom   nose-Nom   be-long
         'The elephant has a long nose.'

     b. Mary-ka   ku namwu-lul   kaci-lul   kut-lul   callassta.
         M-Nom   the tree-Acc   branch-Acc   end-Acc   cut
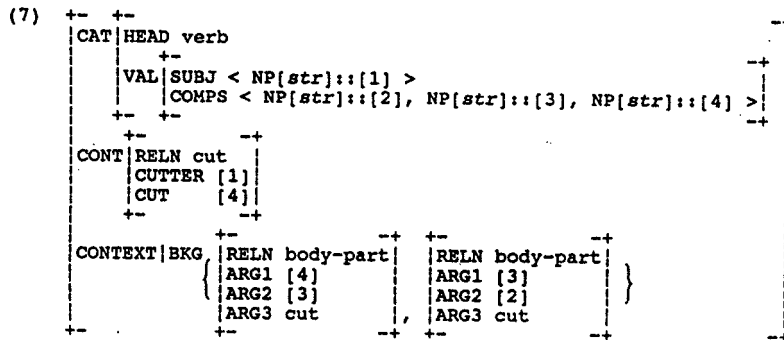   'Lit. Mary cut the end of the branch of the tree.'

Choe (1985) argues that it is necessary to assume INFL and VP nodes in order to account for this kind of structural case assignment involved here. Nominative case is assigned to an S-adjoined NP by INFL, while accusative case is assigned to a VP-adjoined NP.

However, this kind of argument does not provide theory-independent evidence for the existence of the VP node because different theories have different case assignment mechanisms. For instance, in Head-Driven Phrase Structure Grammar (HPSG), valence features such as SUBJ and COMPS are used for the selection of a subject and complements, respectively. The value of SUBJ and COMPS is a list which can contain more than one element. Multiple nominative/accusative constructions are explained if we assume that nominative case is assigned to all NPs of subject daughters with structural case, while accusative case is assigned to all NPs of complement daughters with structural case by the Case Principle discussed in Chapter 2, which is repeated below.

(6) A *structural* NP which is a daughter of a phrase α is [*nom*] if it is a SUBJ-DTR of α, and [*acc*] if it is a COMP-DTR of α.   (Yoo (1993):189)

In Chung (1993), I propose a flat structure analysis of the inalienable possession

construction (e.g., (5)) and suggest a lexical rule which can derive a lexical entry in (7) for the verb in sentence (5b).

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(7)  +-  +-                                                      -+
     |CAT|HEAD verb                                               |
     |   |  +-                                                 -+ |
     |   |VAL|SUBJ  < NP[str]::[1] >                            | |
     |   |   |COMPS < NP[str]::[2], NP[str]::[3], NP[str]::[4] >| |
     |   +-  +-                                                 -+ |
     |      +-            -+                                       |
     |CONT|RELN cut      |                                        |
     |    |CUTTER [1]|                                            |
     |    |CUT    [4]|                                            |
     |    +-            -+                                        |
     |         +-              -+  +-              -+             |
     |CONTEXT|BKG |RELN body-part| |RELN body-part|              |
     |       (   |ARG1 [4]      | |ARG1 [3]      |  )            |
     |       {   |ARG2 [3]      | |ARG2 [2]      |  }            |
     |           |ARG3 cut      | |ARG3 cut      |               |
     +-          +-           , -+  +-           -+            -+
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(7) says that the verb *callassta* 'cut' takes three NP objects which have *str(uctural)* case: NP[*str*]::[2] *ku namwu* 'the tree', NP[*str*]::[3] *kaci* 'branch', and NP[*str*]::[4] *kkut* 'end'; and that the NP::[4] bears the patient role of CUT, while the other objects are related to this index through the successive body-part relationships specified in the value of the BACKGROUND (BKG) attribute. The verb also takes a subject which also has structural case, NP::[1] *Mary*.

Then, the multiple accusative case assignment is accomplished by (6), i.e. the NPs *ku namwu* 'the tree', *kaci* 'branch', and *kkut* 'end' are COMP-DRTs, and thus accusative case *-lul* is realized on them, while the NP *Mary* is a SUBJ-DTR, and thus nominative case *-ka* is realized on it. The multiple nominative case assignment is accomplished by the same mechanism.

2.1.3. Emotion Verb Constructions

Sells'(1990) argument for the VP node in Japanese is based on nominative objects of stative verbs. In spite of certain differences between Korean and Japanese, this kind of construction exists in Korean (i.e., the emotion verb construction). The corresponding Korean sentences are as follows:

(8) a. Nay-ka   sakwa-ka   cohta.
        I-Nom   apple-Nom   like

   'I like apples.'

   b. * Sakwa-ka   nay-ka   cohta.
        apple-Nom   I-Nom   like

Sells argues that the ungrammaticality of (8b) is evidence that *sakwa-ka cohta* is a VP constituent because the ungrammaticality is due to the extraction of *sakwa-ka* out of the VP. However, the contrast seems to be due to a violation of the Linear Precedence (LP) constraint in (9) which is imposed on among the arguments with the same case marker, rather than due to the existence of the VP node.

(9)   Coarguments with the same case must be linearized in order of obliqueness, i.e., the less oblique one must precede the more oblique one.

The LP constraint in (9) states that when both arguments have the same case marking,

the less oblique one (the subject) must precede the more oblique one (the complement). On this approach, (8b) is correctly predicted to be unacceptable because it violates (9), i.e., in (8b), *nay-ka* 'I' and *sakwa-ka* 'apples' are a subject and a complement, respectively, and thus *nay-ka* must precede *sakwa-ka*. Note that , as mentioned in section 1.2.4.1 of chapter 1, an emotion verb assigns lexical nominative case to the NP complement *sakwa* 'apple'. See section 4.4.1 in chapter 4 for other instances of case marking constraints on scrambling imposed by the LP constraint in (9). Note that, on this approach, the nominative object does not need to be dominated by a VP, because a flat structure analysis is possible.

This LP approach seems to be more promising than Sells' approach when we consider sentences such as those in (10) in which the subject is marked with the constrastive marker *-nun* and preceded by the nominative complement.

(10)   Sakwa-ka   na-nun   cohta.
        apple-Nom   I-Cont   like
        'I like an apple (but I do not know whether others like it).'

My approach predicts (10) to be grammatical since it does not violates the LP constraint in (9), i.e., (9) does not apply to (10) since (10) does not have coarguments with the same case marker. If we follow Sells' argument, however, it is hard to explain why (10) is well-formed while (8b) is not. In terms of Sells, in (10), the complement with nominative case seems to be extracted out of the VP node, which entails that the VP constituent cannot be the real reason of the ungrammaticality of (8b).

2.1.4. Honorific Agreement

Some arguments for the existence of the VP node in Korean or Japanese involve the asymmetrical behavior of subject and object. One example showing the asymmetry is the honorific agreement phenomenon illustrated in (13):

(13)   a. Sensayng-nim-kkese   haksayng-lul   kkucicu-si-essta.
            teacher-Hon-Nom[Hon]   student-Acc   scold-Hon-Past
            'The teacher scolded a student.'

        b. # Haksayng-i   ku sensayng-nim-lul   conkyungha-si-essta.
            student-Nom   the teacher-Hon-Acc   respect-Hon-Past
   'A student respected the teacher.'

Even though (13) shows that only a subject can trigger honorific agreement, it does not necessarily mean that we need to assume that a subject should be configurationally distinguished from other complements. As mentioned above, in HPSG, the SUBJ and COMPS lists are used for the selection of a subject and complements. In this theory, the asymmetry between a subject and a complement can be explained with these features without assuming that grammatical relations such as subject or complement are only definable in tree-configurational terms. That is, in order to account for the asymmetry between object and subject here, we can say that only the NP in the SUBJ list triggers the agreement. See Pollard and Sag (1994, Chapter 2) for more detailed accounts of Korean honorific agreement in the framework of HPSG.

2.1.5. VP-Topicalization and VP-Clefting

Choe (1989) claims that Korean has VP topicalization and VP clefting, and that this is evidence that a VP constituent exists in Korean. The examples are as follows:

(14) a. [VP Ton-ul   pel-ki-nun]   Mary-ka   hanta.
          money-Acc   make-Nmlz-Top   M-Nom   do
          'As for making money, Mary does it.'

      b. Mary-ka   ha-nun   kes-ilan [VP ton-ul   pe-nun]   kes-ita.
          M-Nom   do-Top   Comp-be   money-Acc make-Top   Comp-be
          'What Mary does is to make money.'

In (14a), the VP constituent *ton-ul pel-ki-nun* 'making money' occurs at the sentence initial position with the topic marker *-nun*. In (14b), the VP *ton-ul pe-nun* 'to make money' occurs between *kes-ilan* and *kesita* to be focused. Choe does not provide any specific analyses which show how each sentence in (14) is derived from its D-structure. However, we may assume the following simplified structure in (15) for the D-structure of (14a) for example, from which the S-structure in (16) is derived:

(15)

(16)
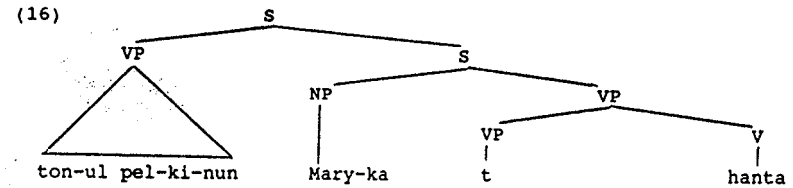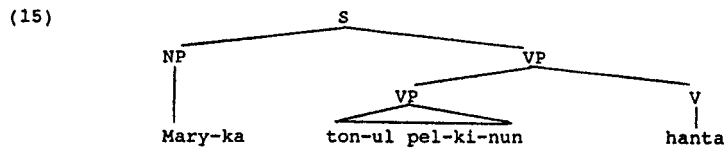
We agree with Choe (1989) that Korean has VP constituents. For example, in section 4.1.1 in chapter 4, we propose that VP constituents actually exist in Korean when they are subcategorized for by control, raising and causative *ha* verbs. On our analysis, the control verb construction for example can be analyzed as follows:

(17) a. Mary-ka   John-hanthey [VP ku chayk-ul   ilkulako] malhayssta.
          M-Nom   J-to   the book-Acc read   told
          'Mary told John to read the book.'

      b.
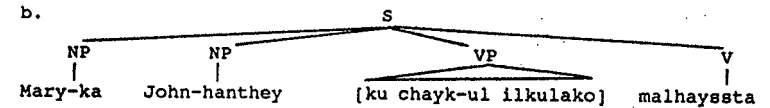
On this line of approach, the sentence in (14a) is an instance of subject-control verb construction which has the structure in (18), where the verb *hata* 'do' is analyzed as a kind of control verb:

(18)
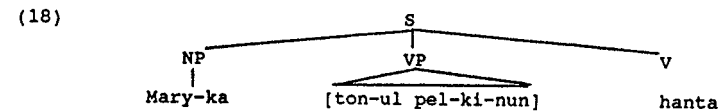
In (18), the VP is a constituent, and so it can be topicalized or clefted as a unit to make (14a) or (14b). However, the existence of a VP node in certain constructions does not necessarily mean that clausal structure in Korean is hierarchical, as shown in (18). Therefore, VP topicalization and VP clefting themselves cannot be evidence that Korean has hierarchical clause structures. (See section 4.1.1 for the motivations of the assumption that a VP node exists when it is subcategorized for by certain verbs.)

2.1.6. Binding Theory

Another argument for VP based on asymmetry between subject and object in Korean or Japanese involves the binding theory of an anaphor such as *caki* in Korean or *zibun* in Japanese. In GB, such configurational notions as government and c-command are crucial in the account of anaphor binding. In this section, however, we will propose that the anaphor binding condition in Korean needs to be reformulated in terms of non-configurational notions such as obliqueness-command (Pollard and Sag (1992, 1994)) and linear precedence, rather than in terms of a configurational notions such as c-command and reconstruction. We will also accordingly reformulate principles B and C.

2.1.6.1. Korean Anaphora and Principle A

It has been proposed that there are two types of constraints on anaphor binding cross-linguistically: syntactic constraints and discourse or pragmatic constraints, e.g., Roberts

(1987), Pollard and Sag (1992, 1994), Reinhart and Reuland (1991, 1993), Baker (1994), and Xue, Pollard and Sag (1994), among others. The dichotomy between syntactic constraints and discourse constraints seems to obtain in Korean too. In Chung (1994, to appear), we have investigated anaphor binding possibilities in Korean. What we proposed was that an antecedent must be more prominent than its anaphor at the syntactic or discourse level to satisfy the anaphor-antecedent dependency. More specifically, we proposed (i) that the syntactic anaphor binding condition in Korean needs to be reformulated in terms of the notion of syntactic prominence, which is based on the concepts of obliqueness and linear precedence, and (ii) that interaction between the presuppositions of contrastive focus and linear precedence can affect discourse prominence of an antecedent. What is directly relevant to the current discussion is the first one, syntactic anaphor binding.

We can think of two different types of syntactic conditions on *caki* binding, one for locally bound *caki* and the other for non-locally bound *caki*. That is, we treat *caki* as syntactically ambiguous between the two. In this section, we will focus on the syntactic binding condition of locally bound *caki*, postponing the discussion of the syntactic binding condition of non-locally bound *caki* to section 2.1.7.2. The non-locally bound anaphor is treated as a pronoun.

The typical pattern of locally bound anaphor constructions in Korean is that an anaphor is a complement and its antecedent is a subject, as in (19a). In such a case, as shown in (19b), linear order of the anaphor and its antecedent does not affect the binding possibility: in (19b), the anaphor is scrambled into sentence initial position and linearly

precedes its antecedent, and the sentence is still acceptable.

(19) a. Ku namca$_i$-ka caki$_i$-hanthey phyenci-lul ssessta.
          the man-Nom self-to   letter-Acc   wrote

      'The man$_i$ wrote a letter to himself$_i$.'

      b. Caki$_i$-hanthey ku namca$_i$-ka phyenci-lul ssessta.
          self-to   the man-Nom letter-Acc   wrote

The sentences in (20) are the reverse of the typical pattern, i.e., the anaphor is

a subject, and its antecedent is a complement. Both of the sentences in (20) are

unacceptable.

(20) a. * Caki$_i$-ka   ku namca$_i$-hanthey   pyenci-lul ssessta.
             self-Nom the man-to   letter-Acc wrote

      Lit. 'Himself$_i$ wrote a letter to the man$_i$.'

      b. ?? Ku namca$_i$-hanthey caki$_i$-ka   pyenci-lul ssessta.
              the man-to   self-Nom   letter-Acc wrote

The sentences in (21a,b) contain a primary object antecedent and a secondary

object anaphor, while those in (21c,d) contain a secondary object antecedent and a

primary object anaphor. This set of data shows that when the antecedent is not a subject,

the antecedent must precede its anaphor.

(21) (in a context in which the speaker tried to introduce two different Mary's to each
      other via e-mail, but actually introduced one Mary to herself by mistake)

      a. Nay-ka   silswu-lo   Mary$_i$-lul caki$_i$-hanthey sokayhayssta.
          I-Nom   by-mistake   M-Acc   self-to   introduced

      'I introduced Mary$_i$ to herself$_i$ by mistake.'

      b. * Caki$_i$-hanthey nay-ka   silswu-lo   Mary$_i$-lul sokayhayssta.
             self-to   I-Nom   by-mistake   M-Acc   introduced

      c. Nay-ka   silswu-lo   Mary$_i$-hanthey   caki$_i$-lul sokayhayssta.
          I-Nom   by-mistake   M-to   self-Acc   introduced

      Lit. 'I introduced herself$_i$ to Mary$_i$ by mistake.'

      d. * Caki$_i$-lul   Nay-ka   silswu-lo   Mary$_i$-hanthey   sokayhayssta.
             self-Acc   I-Nom   by-mistake   M-to   introduced

In the rest of this section, we will account for the given facts through the notion

of *prominence-command*, which is defined by relative obliqueness and linear precedence

between an anaphor and its binder. Pollard and Sag (1992, 1994) assume the obliqueness

hierarchy in (22):

(22) Subject < Primary Object < Secondary Object < Obliques ...

However, not every language makes all the distinctions on the obliqueness hierarchy (22).

For example, if in a language, Primary Object (PO) and Secondary Object (SO) positions

are not syntactically distinguished (e.g. Kinyarwanda, a Bantu language, in Gary and

Keenan (1976)), then we can assume that the distinction between the PO and SO on the

obliqueness hierarchy does not exist.

We assume that the distinction between PO and SO does not exist on the obliqueness hierarchy in Korean, and they are treated as having the same degree of obliqueness. There seems to be at least one independent motivation for this. In Korean, SO can be distinguished from PO by case markers: SO is marked by *-eykey* or *-hantey* 'to' whereas PO is marked by *-lul*. However, in casual speech, this morphological distinction is often not made and both objects exhibit the *-lul* marking. In this case, unlike English, the order between the objects is free, as shown in (23), and passivization is allowed only when both accusative NPs become nominative, as shown in (24):

(23) a. Nay-ka   Mary-lul   sakwa-lul cwu-essta.
         I-Nom   M-Acc   apple-Acc give-Past

         'I gave Mary an apple.'

      b. Nay-ka   sakwa-lul Mary-lul   cwu-essta.
         I-Nom   apple-Acc M-Acc   give-Past

(24) a. */?? Mary-ka   sakwa-lul   cwue-ci-essta.
              M-Nom   apple-Acc   give-Passive-Past
              'Mary was given an apple.'

      b. * Sakwa-ka   Mary-lul   cwue-ci-essta.
            apple-Nom   M-Acc   give-Passive-Past
            Lit. 'An apple was given Mary.'

      c.   Mary-ka   sakwa-ka   cwue-ci-essta.
            M-Nom   apple-Nom   give-Passive-Past
            'An apple was given to Mary/Mary was given an apple.'

Passivization is generally assumed to be a test to distinguish PO from SO. However, even this test does not distinguish them. Thus, we may say that at least in this construction,

they are morphologically and syntactically indistinguishable.

On the basis of this observation, we propose the obliqueness hierarchy in (25) for Korean, which says that a subject is less oblique than a complement, and complements are all equally oblique.[2]

(25)   Subject < Complements < ...

The hierarchy in (25) can account for the asymmetrical binding possibilities for subject antecedents vs. object antecedents illustrated in (19) and (21). That is, when an antecedent is less oblique than its anaphor (e.g. (19) where an antecedent is a subject and its anaphor is an object), linear order does not matter, but when an antecedent and its anaphor are equally oblique (e.g. (21) where an antecedent and its anaphor are both complements), the antecedent must precede its anaphor. That is, we cannot account for all binding facts solely depending on the obliqueness of the arguments. We also need to consider linear precedence among coarguments.

To formulate the principle of syntactic anaphor binding, we define a new notion of *local prominence-command* (*local p-command* hereafter) in (26), based on the

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[2]O'Grady (1987) assumes the same type of grammatical relation hierarchy to account for Korean anaphora (i.e., PO and SO have the same rank on the hierarchy) and shows its advantage. Our theory can make the same predictions as O'Grady's in that respect.

obliqueness hierarchy and linear order. The definition of local o-command is in (27):[3]

(26)   Local P-Command: X locally *p-commands* Y iff

either   (i) X locally o-commands Y,[4]

or   (ii) X and Y are equally oblique and X precedes Y.

(27)   Local O-Command: Y *locally o-commands* Z iff Y is less oblique than Z.

The concept of *prominence-bind* (*p-bind*) and the syntactic anaphor binding condition (principle A) in Korean are defined in (28) and (29), respectively, based on the notion of p-command.

(28)   Local P-Bind: X *locally p-binds* Y iff

X and Y are coindexed and X locally p-commands Y.

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[3]The formulation in (26) may be considered as a descriptive generalization on syntactic prominence, in that two different cases are disjunctively described. A deeper generalization is left for further study, if such a generalization exists at all.

[4](26i) can be simply rephrased as follows:

(i)   X is less oblique than Y.

We use the notion of local o-command because it is also used in the bound variable binding condition in the next section, which is relatively simply formulated with the notion.

(29)   The Binding Condition of Locally Bound *Caki* (Principle A):

Locally p-commanded *caki* must be locally p-bound.

Now let us consider the relevant data given in (19)-(21). The sentences in (19) are all acceptable because the antecedent *ku namca-ka* 'the man' p-commands its anaphor *caki-lul* 'self' due to (26i). Sentences (21a,c) also observe (29) due to (26ii), i.e., the anaphor and its antecedent are equally oblique, and the antecedent precedes its anaphor. In contrast, sentences (21b,d) are correctly predicted not to satisfy the condition in (29). Here the antecedent neither locally o-commands nor precedes its anaphor. The sentences in (20) do not satisfy (29) either since the anaphor locally o-commands its antecedent. Those sentences in (20) and (21b,d) are unacceptable due to a violation of principle C, which will be discussed in section 2.1.6.3.

Before discussing the alternatives and their problems, we will digress briefly to provide an independent motivation for the definition of local p-command in (26), showing that the distribution of the possessor NP and the body-part NP in the inalienable possession construction can also be accounted for by the notion of p-command.

The inalienable possession construction (IAP hereafter) owes its name to the fact that there is an inalienable body-part relationship between two accusative NPs: e.g. *John-ul* is a possessor NP (PS NP hereafter) and *son-ul* is a body-part NP (BP NP hereafter) in (30).

(30) Mary-ka John-ul son-ul capassta.
M-Nom J-Acc hand-Acc held
'Mary held John's hand.'

In the IAP, a PS NP always precedes a BP NP. (Yoon (1989), and O'Grady (1991),

among others) as shown in (31).

(31) *Mary-ka son-ul John-ul capassta.
M-Nom hand-Acc J-Acc held
'Mary held John's hand.'

However, the BP NP can precede the PS NP when the PS NP is passivized, as shown

in (32b).

(32) a. John-i son-ul cap-hi-essta.
J-Nom hand-Acc be-caught

'John's hand is caught.'

b. Son-ul John-i cap-hi-essta.
hand-Acc J-Nom be-caught

The BP NP alone cannot be passivized (Kang (1987), Yoon (1989), and O'Grady

(1991)), as shown in (33), while it can be passivized when the PS NP is passivized as

shown in (34a):

(33) a. *Son-i John-ul caphiessta.
hand-Nom J-Acc be-caught

'John's hand is caught.'

b. *John-ul son-i caphiessta.
J-Acc hand-Nom be-caught

(34) a. John-i son-i cap-hi-essta.
J-Nom hand-Nom be-caught

'John's hand is caught.'

b. *Son-i John-i cap-hi-essta.
hand-Nom J-Nom be-caught

Note that when both NPs are passivized, the PS NP must precede its BP NP, as shown

in (34b).

In Chung (1993b), we suggested a flat structure analysis of the IAP, which

provides a more restricted way of explaining the scrambling phenomena. As argued by

Guéron (1985) among others, the referent of a BP NP depends on its PS NP within a

local domain: roughly speaking, in order to identify a BP NP, we need to identify its PS

NP first. And this referential dependency of the BP NP makes it similar to anaphora even

though it differs from real anaphors: in the case of real anaphora, there is a coindexing

relation between the dependent NP and its antecedent, whereas in the case of the body-

part relationship, there is no such relation between the BP NP and the PS NP. In spite

of this difference, the BP NP has a referential dependency on its PS NP, and we propose

syntactic restriction (35) to account for this type of dependency, based on the notion of

local p-command relation in (26).

(35)   A BP NP must be locally p-commanded by its PS NP.

On our approach, (30) is acceptable because the PS NP *John-lul* and the BP NP *son-lul* are equally oblique, and the PS NP precedes the BP NP. (31) is unacceptable because the PS NP follows the equally oblique BP NP. In (32), the linear precedence between the PS NP and the BP NP does not matter because the PS NP is less oblique than the BP NP. The sentences in (33) are all unacceptable because the BP NP is more oblique than the PS NP. Sentence (34a) is acceptable because the PS NP precedes the equally oblique BP NP, while sentence (34b) is unacceptable because the PS NP follows the equally oblique BP NP.

These observations on the IAP provide an independent motivation for the notion of p-command and indirectly support our suggestions that the relative prominence between an anaphor and its antecedent plays a crucial role in binding of syntactic anaphors in Korean.

We will extend the definition of local p-command to account for the so-called long-distance anaphor binding and the effect of long-distance scrambling on it in chapter 5.

In the next section, we will discuss some recent proposals about anaphor binding in Japanese and their problems that arise when we try to apply them to Korean anaphor binding.

2.1.6.2. Previous Analyses and Their Problems

2.1.6.2.1. Saito (1992)

In Saito (1992), binding in Japanese is accounted for by the notion of c-command and the properties of a scrambled position. A summary of Saito's theory is given in (36):

(36)   At LF, the scrambled position (which is a non-A and non-operator position at S-structure) must satisfy at least one of the following three options: (a) it disappears, (b) it is reanalyzed as an operator position, or (c) it is reanalyzed as an A position.

If one of these options satisfies principle A, the scrambled sentence containing an anaphor is considered to be grammatical. Saito does not explicitly specify at which level binding must occur, but we can infer that it must be at LF. The grammaticality of the sentences discussed in the previous section is then accounted for as follows. In (19b), the reflexive is adjoined to IP, and the scrambled position occupied by *caki* can satisfy (36a) at LF. In this case, the anaphor is reconstructed into the original position (the position of the trace) at LF, and then the antecedent *ku namca* 'the man' c-commands the reflexive.

However, the sentence in (20b) is problematic for this theory. According to Saito, the position of the antecedent can be reanalyzed as an A-position, and the anaphor *caki* is c-commanded by the antecedent. Thus, this sentence is incorrectly predicted to be grammatical. To avoid this problem, we may assume that the binding theory applies at

both LF and S-structure. However, then a grammatical sentence like (19b) in which the anaphor is not c-commanded by its antecedent at S-structure is problematic. Another problem arises when we consider sentence (21b), which contains a primary object antecedent and a secondary object anaphor, and sentence (21d), which contains a secondary object antecedent and a primary object anaphor. For example, in (21d), the position occupied by *caki-lul* can disappear and the anaphor can be reconstructed into the trace position at LF, making (21d) the same as (21c). Thus, (21d) is incorrectly predicted to be grammatical.

From the above discussion, we may conclude that it is hard to account for all the observations in section 2.1.6.1, solely on the basis of differences among scrambled positions and the notion of c-command. Saito's theory must be augmented with some mechanism which can rule out the unacceptable sentences allowed by his theory.

2.1.6.2.2. Yatabe (1993)

In Yatabe (1993), the ungrammaticality of (21b,d), which is problematic for Saito's account is correctly predicted by the notion of *grammatical command* (*g-command*) and the anaphor binding condition as defined in (37) and (38), respectively.

(37)   X *g-commands* Y iff X is a sister to Y or Z dominating Y and (i) X is a subject, or (ii) neither X nor Y is a subject and X precedes Y.

(38)   An anaphor must be *g-commanded* by its antecedent within the anaphor's domain.

In (21b,d), neither the anaphor nor the antecedent is a subject. (37ii) and (38) together predict that in this case, the antecedent must precede its anaphor.

However, Yatabe incorrectly predicts (20b) to be acceptable. According to his analysis, the description of the structure of (20b) can be roughly as follows: [[SO] [Subject PO Verb]]. This structure is subject to (37ii) since neither the SO nor the [Subject PO Verb] constituent is a subject. Here, the SO g-commands the subject-PO-verb constituent and also the subject within that constituent, since the SO precedes the subject-PO-verb constituent. Thus, Yatabe's theory has the same problem as Saito's.

2.1.6.2.3. Iida (1992)

Following Pollard and Sag (1992, 1994), Iida uses the notion of *obliqueness-command* (*o-command*) to formulate a syntactic condition on *zibun* 'self' binding in Japanese. A summary of her theory is given in (39):

(39)   The reflexive *zibun* must simultaneously satisfy both the minimal syntactic constraint in (40) and a discourse constraint based on the notion of deictic perspective: the reflexive takes as its antecedent an NP whose referent is the individual with whom the speaker identifies himself/herself through his/her deictic perspective.

(40)   *Zibun* may not *o-command* its antecedent.

The definition of o-command is (41):

(41)   O-Command: X *o-commands* Y just in case X locally o-commands Z dominating

Y.

In other words, Iida's syntactic constraint simply says that a reflexive may not be less oblique than its antecedent or a constituent dominating the antecedent. This syntactic constraint alone would permit unacceptable binding possibilities, but those possibilities are ruled out by the discourse constraint based on the notion of speaker's perspectives. That is, (39) is a conjunctive theory of anaphor binding in that a reflexive needs to observe both syntactic and discourse binding constraints simultaneously.

A problem with this approach is that it is not clear how we can handle the effect of scrambling on binding possibilities. For example, it is not clear how the sentences in (21) are accounted for, in which the linear precedence between the anaphor and its antecedent, not their relative obliqueness, plays a crucial role.

Moreover, the conjunctive approach to locally bound anaphor binding, adopted for Korean, turns out to be too strong when we consider sentences like (42c) where the anaphor and antecedent are contrastively focused by focal delimiters *-man* 'only' and *-nun*.

(42)   A: a. Ku namca-eykey   ku yeca-ka   phenci-lul ssess-ni?
                the man-to   the woman-Nom   letter-Acc wrote-Q
                'Did the woman write a letter to the man?'

        B: b. Ani,
                'No,'

            c. Ku namca$_i$-eykey-nun   caki$_i$-man-i   phenci-lul
                the man-to-Foc   self-only-Nom   letter-Acc
                ssessta.
                wrote
                Lit.'Only himself$_i$ wrote a letter to the man$_i$.'

In (42c), the antecedent *ku namca-eykey-nun* 'to the man' is a complement and the anaphor *caki-man-i* 'self' is the subject. Then, the syntactic constraint in (40) incorrectly rules out (42c) because *caki* o-commands the antecedent. Thus, we need to loosen the constraint in (40) further to allow this kind of sentences on this conjunctive approach. If we assume the anaphor binding constraint is disjunctive, i.e., an anaphor needs to observe either syntactic or discourse binding constraint, (42c) may not be a problem. In Chung (to appear), we adopt the latter approach and treat the anaphor in (42c) as a discourse anaphor whose binding possibilities are determined by discourse prominence and linear order. See Chung (to appear) for more detailed discussion about it.[5]

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[5]One of Iida's main arguments for the conjunctive binding theory involves constructions containing multiple occurrences of *zibun* as in (i). (See Howard and Howard (1976) and Aikawa (1993) for similar observations.)

(i)   Hanako-wa   [Taroo-ga zibun-o   zibun-no tomodati-no
        H-Top   T-Nom   self-Acc self-of   friend-of
        hihan-kara   mamorikir-e-nakatta] koto-o   sitteita.
        criticism-from   defend-could-not   COMP-Acc   knew
        'Hanako$_i$ knew that Taroo$_j$ couldn't defend her$_i$ against her$_i$/*his$_j$ friend's criticism.' or

To summarize, we proposed that an antecedent must be more prominent than its locally bound anaphor at the syntactic level to satisfy the anaphor-antecedent dependency. More specifically, we have proposed that principle A in Korean needs to be reformulated in terms of the notion of syntactic prominence (p-command), which is based on the concepts of obliqueness and linear precedence, rather than a configurational notion such as c-command. We conclude that a hierarchical phrasal structure is neither necessary nor sufficient to account for binding of locally bound anaphors. In the next section, we will show how principles B and C can also be reformulated in terms of local p-command.

'Hanako$_i$ knew that Taroo$_j$ couldn't defend him$_j$ against his$_j$/*her$_i$ friend's criticism.'

The only possible reading for (i) is that Taroo could not defend Hanako from the criticism of her (Hanako's) friend, or that Taroo could not defend himself from the criticism of his (Taroo's) friend. It cannot convey that Taroo could not defend Hanako against the criticism of his (Taroo's) friend. If we allow syntactic and discourse binding to apply disjunctively, then there is no reason why both occurrences of *zibun* could not refer to different persons, i.e., the first *zibun* could refer to Taroo by syntactic binding, and the second *zibun* to Hanako by discourse binding. However, this kind of interpretation is not possible here, which is predicted by Iida's conjunctive binding theory, summarized in (39).

In Korean (perhaps in Japanese, too), however, each *caki* can be naturally coindexed with a different antecedent in a sentence as in (ii), where the context forces the intended reading:

(ii) John$_i$-un   [Mary$_j$-ka [caki$_j$ nampyen molay]
     J-Top   M-Nom self's hushand   without the knowledge of
     caki$_i$-lul kuliwehako issulilako]   sayngkakhanta.
     self-Acc miss   be in the state of think
     'John$_i$ thinks that Mary$_j$ misses him$_i$ without her$_j$ husband's knowledge.'

This observation also suggests that Iida's conjunctive theory may be too restrictive for Korean *caki* binding.

2.1.6.3. Principles B and C

We can reformulate principles B and C based on the notion of p-command as follows:[6]

(43)   Principle B: A personal pronoun (ppro) must not be locally p-bound.

(44)   Principle C: A non-pronoun (npro) must not be p-bound by a pronominal (pron).

In (43) and (44), *ppro* stands for an ordinary pronoun such as English *he*, *npro* for a

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[6]Principle C as formulated above may be too strong in that it also rules out the example in (ib) where scrambling ameliorates the standard principle C violation.

(i) a. * Caki$_i$-/ku$_i$-ka/pro [John$_i$-uy kwake]-lul   kiyekhaci moshayssta.
          self-/he-Nom   J-Gen   past-Acc   remember did not

        Lit. 'He$_i$ did not remember John's$_i$ past.'

  b. (?) [John$_i$-uy   kwake]$_j$-lul caki$_i$-/ku$_i$-ka/pro t$_j$ kiyekhaci moshayssta.
            J-Gen   past-Acc   self-/he-Nom   remember did not

We may need to further restrict principle C to account for this fact. However, the called-for restriction would seem to be very complicated one. For example, the amelioration does not occur if the head of the NP dominating the binder is animate, as shown in (iia), or when the binder is an operator, as shown in (iib):

(ii) a. * [John$_i$-uy   emma]$_j$-lul caki$_i$-/ku$_i$-ka/pro t$_j$ kiyekhaci moshayssta.
          J-Gen   mother-Acc self-/he-Nom   remember did not
        Lit. 'He$_i$ did not remember John's$_i$ mother.'

  b. * [Nwukwu$_i$-uy kwake]$_j$-lul   caki$_i$-/ku$_i$-ka/pro t$_j$ kiyekhaci moshani?
          whose-Gen   past-Acc   self-/he-Nom   remember did not
        Lit. 'Whose$_i$ past did not he$_i$ remember?'

We leave the exact formulation of principle C for further study.

referential expression, and *pron* for an ordinary pronoun or a locally bound *anaphor*. See section 2.1.7.2 for a more precise classification of nominal objects. The notions of p-command and p-bound are defined as follows:

(45)   P-Command: X *p-commands* Y iff

X locally p-commands Z dominating Y.

(46)   P-Bind: X *p-binds* Y

iff X and Y are coindexed and X p-commands Y.

For example, let us consider the following sentences:

(47)   a. *   Nay-ka   John$_i$-hanthey   ku$_i$-lul/pro$_i$ sokayhay-cwuessta.
               I-Nom   J-to   he-Acc/pro   introduce-did-as a-favor-for
               Lit. 'I introduced him$_i$ to John$_i$.'

       b. *   Nay-ka   ku$_i$-hanthey/pro$_i$ John$_i$-ul   sokayhay-cwuessta.
               I-Nom   he-to/pro   J-Acc   introduce-did-as-a-favor-for
               Lit. 'I introduced John$_i$ to him$_i$.'

       c. *   John$_i$-i   ku$_i$-lul/pro$_i$ salanghanta.
               J-Nom   he-Acc/pro   love
               Lit.'John$_i$ loves him$_i$.'

       d. *   Ku$_i$-ka/pro$_i$ John$_i$-ul   salanghanta.
               he-Nom/pro   J-Acc   love
               Lit. 'He$_i$ loves John$_i$.'

(48)   *   Ku$_i$-ka/pro$_i$ [$_S$ John-i   ttokttokhatako]   sayngkakhanta.
            he-Nom/pro   J-Nom   be-smart   think
            Lit. 'He$_i$ thinks that John$_i$ is smart.'

(47a,c) are unacceptable due to a violation of principle B. For example, in (47a), the pronoun is locally p-commanded by *John-hanthey* since they are equally oblique and the pronoun is preceded by the binder. In (47c), the pronoun is locally p-commanded by *John-i* since the complement pronoun is o-commanded by the subject binder. (47b,d) are unacceptable due to a violation of principle C, i.e., *John-ul* is locally p-commanded by the pronominal. (48) is unacceptable also due to a violation of principle C, i.e., the embedded subject *John-i* is p-commanded by the matrix subject pronominal. The examples in (20) and (21b,d) in section 2.1.6.1 are instances of principle C violation by the same reason.

Principle C in (44) is formulated in such a way since in Korean and Japanese, a non-pronoun can be p-bound by another non-pronoun, as shown in (49). See Nakayama (1988), Huang (1988), Lasnik (1989) for similar obsevations in Japanese and other languages.

(49)   a.   Park-kyoswunim$_i$-kkeyse [$_S$ kyoswunim$_i$-i   ku il-ul   hasikeysstako]
            Park-professor-Nom   professor-Nom   the work-Acc do-will
            malssumhasiessta.
            said
            'Prof. Park$_i$ said that he$_i$ will do the work.'

       b.   (?) Mary$_i$-ka   Mary$_i$-lul   cohahanta.
            M-Nom   M-Acc   like
            'Mary$_i$ like herself$_i$.'

2.1.7. Weak Crossover Effects

Since at least Wasow (1979), the weak crossover (WCO) effect has been used as a diagnostic for movement. In this thesis, we assume that scrambling in Korean does not involve movement and thus leaves no trace. This predicts scrambling does not induce WCO effects at all. Then the putative WCO effect reported in the literature (Saito and Hoji (1983), Choe (1989), Lee (1991, 1993), Saito (1992), and Cho (1994) among others) must be accounted for in different ways. In this section, first, we will review Saito and Hoji's (1983) claim that the WCO effect occurs in the psych-verb construction with backward reflexivization in Japanese, showing that the construction actually cannot be considered to have the WCO effect in some respects. Then we will consider some canonical cases of WCO and some other relevant data, trying to show that the so-called WCO condition can be accounted for in nonconfigurational terms such as relative obliqueness and linear precedence between a pronominal and its binder, rather than in terms of c-command. To this end, we will explore binding conditions of non-locally bound anaphor *caki* 'self', the overt pronoun *ku* 'he', and the empty pronoun *pro*.

2.1.7.1. Psych-Verb Constructions and Weak Crossover Effects

Under the assumption that in Japanese, the non-locally bound reflexive *zibun* 'self' has a property of a bound variable when it is locally A-bar bound, Saito and Hoji (1983) argue for a VP node in Japanese, using the psych-verb construction with backward

reflexivization. They claim that the construction can induce the WCO effect due to the existence of a VP node. The Korean sentences corresponding to the Japanese sentences in Saito & Hoji (1983) are as follows:

(50) a. * [$_S$ [$_{NP}$ Mary-ka   caki$_i$-lul   miwehantanun   sasil]-i
             M-Nom   self-Acc   dislike   fact-Nom
           [$_{VP}$ nwukwuna$_i$-/nwukwunka$_i$-lul   koylopkeyhayssta]].
             everyone-/someone-Acc   depressed
           'The fact that Mary dislikes himself$_i$ has depressed everyone$_i$/someone$_i$.'

    b. * [$_S$ [$_{NP}$ Mary-ka   caki$_i$-lul   miwehantanun   sasil]-i
             M-Nom   self-Acc   dislike   fact-Nom
           [$_{VP}$ nwukwu$_i$-lul   koylopkeyhayss-ni]]?
             who-Acc   depressed-Q
           'Whom$_i$ has the fact that Mary dislikes himself$_i$ depressed?'

According to them, the sentences in (50) are unacceptable because the antecedent quantifier (*nwukwuna-/nwukwnka-lul* 'everyone/someone' or *nwukwu-lul* 'who') is scrambled to the S-adjunction position at LF, resulting the structure in (51):

(51)
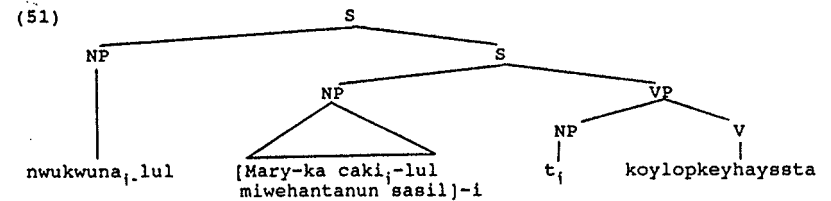
Here, due to the existence of the VP node, the anaphor *caki-lul* neither c-commands nor is c-commanded by the variable (i.e., the trace), and thus the configuration in (51) fits

the condition in (52), which is assumed to induce the WCO effect by Saito and Hoji (1983).

(52) A variable cannot be the antecedent of a pronoun or an anaphor that it does not

c-command.   ((30) in Saito and Hoji (1983))

Saito and Hoji (1983) also claim that scrambling in Japanese (or Korean for that matter) must be an instance of move-α, based on the weak crossover effect in the same construction.[7]

(53) a. [NP Mary-ka caki-lul_i miwehantanun sasil]-i John-lul_i
M-Nom self-Acc dislike fact-Nom J-Acc
sulphukeyhanta.
make-sad

Lit. 'The fact that Mary dislikes himself_i made John_i sad.'

b. *? John-ul_i [NP Mary-ka caki-lul_i miwehantanun sasil]-i
J-Acc M-Nom self-Acc dislike fact-Nom
t_i sulphukeyhanta.
make-sad

(54) a. [NP Mary-uy caki-lul_i hyanghan salang]-i John-lul_i
M-Gen self-Acc toward love-Nom J-Acc
nolakeyhayssta.
surprised

Lit. 'Mary's love toward himself_i surprised John_i.'

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[7]Unlike the standard assumptions, Saito and Hoji (1983) assume that a trace of any scrambled category (trace of quasi-operator in their terms), be it a quantifier, a *wh*-word or a definite, is a variable and induces the WCO effect in an appropriate context. However, see section 2.1.7.2 for an argument against this view.

b. *? John-lul_i [NP Mary-uy caki-lul_i hyanghan salang]-i t_i
J-Acc M-Gen self-Acc toward love-Nom
nolakeyhayssta.
surprised

They argue that the ungrammaticality of (53b) and (54b) arises from the WCO effect that is caused by the movement of *John-lul* to the sentence initial position. That is, the non-local reflexive *caki-lul* 'self' is not c-commanded by the trace. This results in the same configuration as in (51) at S-structure, which is predicted to be unacceptable due to the WCO effect condition in (52). They argue further that this is evidence for the hypothesis that scrambling is an instance of move-α.

One of the problems with Saito and Hoji's analysis is that it is hard to tell whether that kind of WCO effect exists at all in Korean. To see why, let us consider the sentences in (55)-(57), which are considered to be typical examples involving movement and its effect on binding of the non-locally bound anaphor *caki*. (See Saito (1992) and Cho (1994) among others, for the same observations.)

(55) a. * [Caki_i-uy chinkwu]-ka nwukwu_i-lul paypanhayssni?
self-Gen friend-Nom who-Acc betrayed-Q

'Who_i did his_i friend betray?'

b. Nwukwu_i-lul [caki_i-uy chinkwu]-ka t_i paypanhayssni?
who-Acc self-Gen friend-Nom betrayed-Q

(56) a. * [Caki_i-uy chinkwu]-ka nwukwunka_i-lul paypanhayssta.
self-Gen friend-Nom someone-Acc betrayed

Lit.'His_i friend betrayed someone_i.'

b. Nwukwunka$_i$-lul [caki$_i$-uy chinkwu]-ka   t$_i$ paypanhayssta.
   someone-Acc   self-Gen friend-Nom   betrayed

(57)   a.   *   [Caki$_i$-uy chinkwu]-ka   John$_i$-lul   paypanhayssta.
            self-Gen friend-Nom   J-Acc   betrayed

          Lit. 'His$_i$ friend betrayed John$_i$.'

    b.   John$_i$-lul   [caki$_i$-uy chinkwu]-ka   t$_i$ paypanhayssta.
        J-Acc   self-Gen friend-Nom   betrayed

All the (b) sentences in (55)-(57) have the exactly the same structure as the one in (51) at least at S-structure, and they are all incorrectly predicted to be unacceptable by Saito and Hoji due to the WCO effect condition in (52). From Saito and Hoji's point of view, one way to interpret the data in (55)-(57) might be to assume that the WCO effect induced at LF by quantifier movement is ameliorated by scrambling. However, this approach cannot be extended to the account of (53b) and (54b) because scrambling here does not ameliorate the WCO effect.

Also note that in Saito (1992), Saito himself acknowledges that the sentences in (53) and (54) may not be a set of data which evidently show the WCO effects in Japanese. He provides the sentence in (58) (=(10b) in Saito (1992)) which contains the *wh*-word *dare* 'who' and an overt bound variable *soitu* 'the guy' which he considers to induce the WCO effect in Japanese just as an English overt pronoun does.

(58)   ?   Dare$_i$-o   [[soitu$_i$-no   hahaoya]-ga   t$_i$ aisiteru]
        who-Acc   the guy-Gen   mother-Nom   love
        'Who$_i$ does his$_i$ mother love t$_i$.'

Saito notices that this example is marginally acceptable in Japanese, while (50), (53b) and (54b) are unacceptable, and that these judgements cause some theoretical inconsistencies. He mentions that the judgement of (58) seems to be more solid, and that the ill-formedness of (50), (53b) and (54b) cannot be attributed directly to WCO effect (footnote 5 in Saito (1992)). From these observations, we may conclude that it seems impossible to consistently account for all the given data if we assume that sentences in (50), (53) and (54) all involve the WCO effect. That is, the claim is suspicious that the unacceptability of the psych-verb construction is due to the WCO effect. But if they are not instances of WCO effects, then they cannot be evidence for the claim that scrambling is an instance of move-α and for the existence of a VP node. Investigations of what factors make worse the psych-verb constructions in (50), (53b) and (54b) remain for further study.

2.1.7.2. Pronominal Binding and Weak Crossover Effects

In this section, we will discuss some instances of canonical WCO effects and relevant data, trying to show that the WCO effects can be accounted for by general binding conditions of pronominal expressions such as the non-locally bound anaphor *caki* 'self', the overt pronoun *ku* 'he/she', and the empty pronoun *pro*.[8][9] We will try to show that

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[8] It is still controversial which pronominal induces the WCO effect in Korean and Japanese. For example, among others, *pro* is assumed to induce the WCO effect in Lee (1991, 1993); *ku* 'he' in Choe (1983) and Cho (1994); *zibun* 'self' (*caki* in Korean) in Saito and Hoji (1983); and *soitu* 'the guy' in Saito (1992).

[9] Aikawa (1993) proposes that in Japanese, the specifier *zibun* 'self' which does not have a higher specifier as its binder can be construed as a bound variable. Our

even the canonical structure that is believed to induce WCO effects cannot be evidence
for hierarchical clause structure in Korean.

Let us consider the following data first where a pronominal expression is
contained within a subject NP and its antecedent is a complement (cf. (55)-(57)):

(59) a. * [Caki$_i$-/ku$_i$-uy/pro$_i$ chinkwu]-ka nwukwu$_i$-lul paypanhayssni?
          self-/he-Gen/pro friend-Nom   who-Acc   betrayed-Q

      'Who$_i$ did his$_i$ friend betray?'

      b. Nwukwu$_i$-lul [caki$_i$-/ku$_i$-uy/pro$_i$ chinkwu]-ka t$_i$ paypanhayssni?
         who-Acc   self-/he-Gen/pro friend-Nom   betrayed-Q

(60) a. * [Caki$_i$-/ku$_i$-uy/pro$_i$ chinkwu]-ka nwukwuna$_i$-lul sinloyhanta.
          self-/he-Gen/pro friend-Nom   everyone-Acc   trust

      Lit.'His$_i$ friend trusts everyone$_i$.'

      b. Nwukwuna$_i$-lul   [caki$_i$-/ku$_i$-uy/pro$_i$ chinkwu]-ka t$_i$ sinloyhanta.
         everyone-Acc   self-/he-Gen/pro friend-Nom   trust

These examples are considered to be typical instances involving movement of a quantifier
or *wh*-word and its effect on binding of the non-locally bound anaphor *caki* 'self', overt
pronoun *ku* 'he' and empty pronoun *pro*. (See Lee (1991,1993), Saito (1992) and Cho
(1994) among others, for the same or similar observations.) In terms of GB, (59) and

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treatment of non-locally bound *caki* as a bound variable is similar to her proposal in that
the specifier *zibun* is not locally bound. However, the notion of non-locally bound *caki*
is more general than that of the specifier *caki* in that the former also includes non-
specifier *caki* such as a subject or a complement *caki* which is not bound by a more
prominent co-argument. See section 5.4 in chapter 5 for discussion of non-locally bound
caki which is a non-specifier.

(60) might be accounted for by an assumption that the WCO effect occurs at LF by
operator movement such as quantifier raising and *wh*-movement, but the effect is
ameliorated by scrambling, i.e., scrambling needs to be assumed to be A-movement as
in Mahajan (1990).

Unlike the typical English WCO effect, a similar pattern of judgement is obtained
in Korean and Japanese even when the moved category is not a typical quantifier or *wh*-
word, as shown in (61):

(61) a. [*Caki$_i$-/*ku$_i$-uy/pro$_i$ chinkwu]-ka   John$_i$-/ku namca$_i$-lul   paypanhayta.
          self-/he-Gen/pro friend-Nom   J-/the man-Acc   betrayed

      Lit.'His$_i$ friend betrayed John$_i$.'

      b. John$_i$-/ku namca$_i$-lul [caki$_i$-/ku$_i$-uy/pro$_i$ chinkwu]-ka t$_i$ paypanhayta.
         J-/the man-Acc   self-/he-Gen/pro friend-Nom   betrayed

According to Saito and Hoji (1983), the examples with *caki* and *ku* in (61a) can be
instances of the WCO effect since they assume that the definite antecedent (quasi-
operator) also moves across the subject at LF in Korean and Japanese, and that its trace
is a variable. However, it is not true that a definite and an indefinite always have the
same binding possibilities in Korean (and perhaps in Japanese either), especially when the
involved pronoun is *pro*. Note that *pro* in (61a) can have a linearly following definite
antecedent, but not a linearly following indefinite antecedent, as shown in (59a) and
(60a). The different *pro* binding possibilities between definite and indefinite antecedents

are also found in the so-called parasitic gap construction, as shown in (62) and (63):[10]

(62) a. John$_i$-/ku namcai-lul Mary-ka [pro$_i$ cal   alci   moshameyto
          J-/the man-Acc   M-Nom   well know do not
          pwulkwuhako]   t$_i$ chotayhayssta.
          although   invited

          'Mary invited John$_i$/the man$_i$ although she does not know him$_i$ well.'

      b. Mary-ka [pro$_i$ cal   alci   moshameyto
          M-Nom   well know do not
          pwulkwuhako] John$_i$-/ku namcai-lul chotayhayssta.
          although   J-/the man-Acc   invited

(63) a. Nwukwu$_i$-lul Mary-ka [pro$_i$ cal   alci   moshameyto
          who-Acc   M-Nom   well know do not
          pwulkwuhako]   t$_i$ chotayhayssni?
          although   invited

          'Who$_i$ did Mary invite although she does not know him$_i$ well?'

      b. ??/* Mary-ka [pro$_i$ cal   alci   moshameyto
                  M-Nom   well know do not
                  pwulkwuhako] nwukwu$_i$-lul chotayhayssni?
                  although   who-Acc   invited

(64) a. Nwukwuna$_i$-lul   Mary-nun [pro$_i$ sakwuykito   ceney]
          everyone-Acc   M-Top   getting acquainted   before
          t$_i$ cinachikey   sinloyhanta.
             exceedly   trust

          'Mary exceedly trusts everyone$_i$ before getting acquainted with him$_i$.'

---

[10]Following Chomsky (1986), Saito (1992) assumes that the empty category within the adjunct in the parasitic gap construction is not a trace but a *pro* because the subjacency condition would be violated if it were assumed to be a trace. In our theory of long-distance scrambling, which will be discussed in chapter 4, the empty category must be analyzed as a *pro*, too.

      b. ??/* Mary-nun [pro$_i$ sakwuykito   ceney]
                  M-Top   getting acquainted   before
                  nwukwuna$_i$-lul cinachikey   sinloyhanta.
                  everyone-Acc   exceedly   trust

(62) shows that *pro* can be bound by a definite NP *John-ul* or *ku namca-lul* 'the man' regardless of its position, whereas (63) and (64) show that *pro* cannot be bound by an indefinite NP when the indefinite occurs after *pro*.

Let us consider other types of data, where a pronominal is contained within an NP and the operator is a subject:

(65) a. Nwu$_i$-ka [caki$_i$-/ku$_i$-uy/pro$_i$ chinkwu]-lul paypanhayssni?
          who-Nom self-/he-Gen/pro friend-Acc   betrayed-Q

          'Who$_i$ betrayed his$_i$ friend?'

      b. [Caki$_i$-/*ku$_i$-uy/pro$_i$ chinkwu]-lul   nwu$_i$-ka   t$_i$ paypanhayssni?
          self-/he-Gen/pro friend-Acc   who-Nom   betrayed-Q

(66) a. Nwukwunka$_i$-ka [caki$_i$-/ku$_i$-uy/pro$_i$ chinkwu]-lul paypanhayssta.
          Someone-Nom   self-/he-Gen/pro friend-Acc   betrayed

          'Someone betrayed his$_i$ friend$_i$.'

      b. [Caki$_i$-/*ku$_i$-uy/pro$_i$ chinkwu]-lul   nwukwunka$_i$-ka t$_i$ paypanhayssta.
          self-/he-Gen/pro friend-Acc   Someone-Nom   betrayed

(67) a. John$_i$-i [caki$_i$-/ku$_i$-uy/pro$_i$ chinkwu]-lul paypanhayssta.
          J-Ncc self-/he-Gen/pro friend-Acc   betrayed

          'John betrayed his$_i$ friend.'

      b. [Caki$_i$-/*ku$_i$-uy/pro$_i$ chinkwu]-lul   John$_i$-i   t$_i$ paypanhayssta.
          self-/he-Gen/pro friend-Acc   J-Nom   betrayed

In this case, *caki* or *pro* can be bound by the subject operator even when the operator follows it. In contrast, *ku* cannot be bound by the subject operator when it linearly follows *pro*.

To account for examples like (65)-(67) as well as (59)-(61), Saito (1992) assumes that at LF, the position for the scrambled NP can either disappear or be reanalyzed as an A position. (See section 2.1.6.2.1.) If the position disappears, the NP in that position is reconstructed into the trace position, which allows a pronominal within the NP to be c-commanded by its antecedent (e.g., (65)-(67)). If the scrambled position is reanalyzed as an A position, the NP in the position becomes an antecedent that can c-command the pronominal (e.g., (59b)-(61b), (62a) and (63a)).

In section 2.1.6.2.1, however, we already discussed that the reanalysis and reconstruction account turns out to be too strong when we consider binding of the locally bound anaphor *caki* 'self', e.g., the account overgenerates sentences such as (20b) and (21b,d). Also note that in section 1.1.2 in chapter 1, we pointed out that the same explanation faces difficulties in accounts of some pronoun binding facts, e.g., it overgenerates sentences like (13b) in section 1.1.2.[11] In both cases, the problem is that

---

[11]Example (13) in section 1.1.2 in chapter 1 is repeated below:

(i) a. Ne-nun   nwunwu$_i$-hanthey [caki$_i$/pro$_i$ sensayngnim]-lul
       you-Top who-to   self/pro   teacher-Acc
       sokayhaycwuessni?
       introduced

     'To whom$_i$ did you introduce his$_i$ teacher?'

  b. */?? [caki$_i$/pro$_i$ sensayngnim]-lul ne-nun
          self/pro   teacher-Acc   you-Top

---

the account cannot capture the fact that scrambling of a subject and a complement has asymmetrical effects on binding possibilities.

Let us now consider a set of data that causes another problem to the reconstruction and reanalysis approach. Here an operator is embedded within an NP, as shown in (68) and (69):[12] [13]

(68) a. * [Nwukwu$_i$-uy kwake]-ka   caki$_i$-/ku$_i$-lul/pro$_i$ koylophyessni?
           who-Gen   past-Nom   self-/he-Acc/pro bothered

     'Whose$_i$ past bothered him$_i$?'

  b. * Caki$_i$-/ku$_i$-lul/pro$_i$ [nwukwu$_i$-uy kwake]-ka   t$_i$ koylophyessni?
         self-/he-Acc/pro   who-Gen   past-Nom   bothered

(69) a. * [Nwukwu$_i$-uy kwake]$_j$-lul   caki$_i$-/ku$_i$-ka/pro$_i$ t$_j$ kiyek moshani?
           who-Gen   past-Acc   self-/he-Nom/pro   could not remember

     'Whose$_i$ past couldn't he$_i$ remember?'

  b. * Caki$_i$-/ku$_i$-ka/pro$_i$ [nwukwu$_i$-uy kwake]-lul   kiyek moshani?
         self-/he-Nom/pro   who-Gen   past-Acc   could not remember

These examples show that when an operator is embedded within an NP, it cannot bind pronominals, regardless of linear order between the operator and pronominals. However,

---

             nwunwu$_i$-hanthey   ___   sokayhaycwuessni?
             who-to   introduced

[12]From now on, we illustrate only the examples where the operator is a *wh*-word just for expository convenience. If we replace the *wh*-word with quantifiers such as *nwukwunka* 'someone' or *nwukwuna* 'everyone', we have exactly the same acceptability judgement.

[13]The examples in (69) are called secondary strong crossover in Postal (1993).

when the pronominals are also embedded within an NP and linearly follow the operator, the embedded operator can bind the pronominals, as shown in (70) and (71), which are counterparts of (68) and (69):

(70) a. [Nwukwu$_i$-uy kwake]-ka [caki$_i$-/ku$_i$-uy/pro$_i$ anay]-lul   koylophyessni?
       who-Gen   past-Nom   self-/he-Gen/pro   wife-Acc   bothered

      'Whose$_i$ past bothered his$_i$ wife?'

   b. * [Caki$_i$-/ku$_i$-uy/pro$_i$ anay]$_j$-lul [nwukwu$_i$-uy kwake]-ka   t$_j$
       self-/he-Gen/pro   wife-Acc   who-Gen   past-Nom
       koylophyessni?
       bothered

(71) a. [Nwukwu$_i$-uy kwake]$_j$-lul   [caki$_i$-/ku$_i$-uy/pro$_i$ emma]-ka   t$_j$
       who-Gen   past-Acc   self-/he-Gen/pro   mother-Nom
       kiyek moshani?
       could not remember

      'Whose$_i$ past couldn't her$_i$ mother remember?'

   b. * [Caki$_i$-/ku$_i$-uy/pro$_i$ emma]-ka   [nwukwu$_i$-uy kwake]-lul
       self-/he-Gen/pro   mother-Nom   who-Gen   past-Acc
       kiyek moshani?
       could not remember

If we assume that a pronominal must be c-commanded by its operator to get bound, then obviously (70a) and (71a) are problematic since here the operator *nwukwu* 'who' is properly contained within an NP and thus the pronominal itself is never c-commanded by the operator.

To account for (70a) and (71a) in terms of c-command, following Safir's (to appear) slash indexing, we might assume that the operator *nwukwu* 'who' alone moves

out of the NP into a higher A-bar position at LF to c-command the NP containing the pronominals. However, this analysis does not work for (68a) and (69a). If it is allowed in (70a) and (71a) to move the operator alone out of the NP into a higher position, the operator also can move in (68a) and (69a) to c-command the pronominals. Thus they are incorrectly predicted to be acceptable.[14] Also note that this quantifier raising technique does not work for (70) either, since the NP *caki-/ku/pro anay-lul* 'his wife' in (70b) can be reconstructed into the trace position at LF. Then (70b) has exactly the same structure as (70a) at LF, which incorrectly entails that (70b) is as acceptable as (70a).

When the antecedent is a non-operator (a definite), however, it is not necessary that the pronominals be embedded within an NP, as shown in (72) and (73), which are counterparts of (68) and (69):

(72) a. [John$_i$-uy kwake]-ka   caki$_i$-/ku$_i$-lul   koylophyessta.
       J-Gen   past-Nom   self-/he-Acc   bothered

      'John's$_i$ past bothered him$_i$.'

   b. * Caki$_i$-/ku$_i$-lul [John$_i$-uy   kwake]-ka   t$_i$ koylophyessta.
       self-/he-Acc   J-Gen   past-Nom   bothered

---

   [14](69a) cannot be ruled out by Principle C, because the reconstruction into the trace position is not obligatory in Saito's theory. That is, if the NP *nwukwu-uy kwake-lul* 'whose past' is reanalyzed as an A position without being reconstructed into the trace position, (69a) is not an example of Principle C violation. Moreover, note that the fully acceptable sentence in (73b) has exactly the same structure as (69a) except that the antecedent is replaced by *John-uy* 'John's'. Thus, if (69a) were ruled out by Principle C, then (73b) should also be ruled out by the same reason.

(73) a. * Caki$_i$-/ku$_i$-ka [John$_i$-uy   kwake]-lul   kiyekhaci moshayssta.
            self-/he-Nom J-Gen   past-Acc   remember did not

Lit. 'He$_i$ did not remember John's$_i$ past.'

b. [John$_i$-uy kwake]$_j$-lul   caki$_i$-/ku$_i$-ka t$_j$ kiyekhaci moshayssta.
     J-Gen   past-Acc   self-/he-Nom   remember did not

In these cases, *caki* and *ku* get bound if they linearly follow their antecedents. Here the position of *pro* is not specified since it is impossible to tell where the empty pronoun appears. However, it is clear that the *pro* versions of the sentences in (72) and (73) are all acceptable regardless of whether *pro* is a subject or an object.

Let us now propose our own analysis of variable binding. Following standard assumptions, our nonconfigurational approach assumes that there are two kinds of pronominal binding, bound variable binding and discourse binding. The former is the case where the binder is an operator such as a quantifier or *wh*-word, and the latter is the case where the binder is a definite. Certain syntactic constraints are concerned with only bound variable binding. We assume that bound variable binding is conditioned by syntactic factors such as relative obliqueness and linear precedence between a pronominal and its binder, while discourse binding is not. Our main concern in this section is what syntactic conditions must be imposed on bound variable binding in Korean.

In section 2.1.6.1, we proposed the obliqueness hierarchy in (25) for Korean, repeated below:

(25)   Subject < Complements < ...

(25) states that a subject is less oblique than a complement, and complements are all equally oblique.

We define a new notion of *proper o-command* in (74), based on the definition of local o-command in (27):

(74)   Y *properly o-commands* Z iff

Y locally o-commands X properly dominating Z.

(74) is a slight revision of o-command in (41), i.e., (74) differs from (41) only in that the former excludes the local o-command relation between Y and Z, while the latter includes it.

The other new definition we need is that of *proper precedence* in (75):
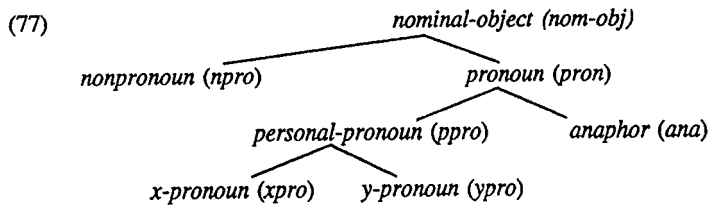
(75)   Y *properly precedes* Z just in case

Y precedes X properly dominating Z.

According to (75), Y properly precedes Z in the following cases:
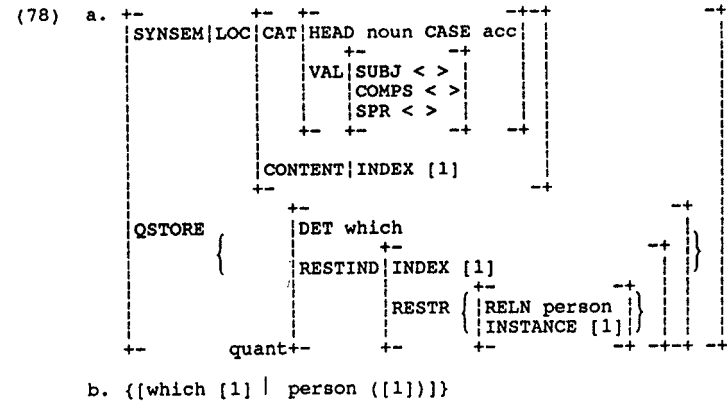
(76) a.

Proper precedence differs from ordinary precedence in that the former describes a linear precedence relationship between non-sister constituents, excluding the linear relationship between sister constituents.

Also we divide three different pronominals discussed above into two subsorts depending on their syntactic similarity and difference. One subsort will be called *x-pronoun* whose binding seems to be conditioned by obliqueness and linear precedence. This includes the non-locally bound *caki* and *pro*. The other subsort will be called *y-pronoun* whose binding is conditioned only by linear precedence. This includes *ku*. In HPSG, these sorts can be represented by the sort hierarchy on nominal categories, as shown in (77):

(77)

```
                        nominal-object (nom-obj)
            _____/        \
   nonpronoun (npro)                    pronoun (pron)
                             _____/        \
                   personal-pronoun (ppro)      anaphor (ana)
                     _____/        \
          x-pronoun (xpro)    y-pronoun (ypro)
```

Before formulating the variable binding conditions, we need to define another concept called operator-complex in Bresnan (1995). HPSG adopts the Q(UANTIFIER) STORE mechanism to handle quantifier scopes, which is developed from the idea of Cooper storage in Cooper (1983). The QSTORE takes as its value a set of *quant(ifier)s*. The feature structure of the sort *quant(ifier)* has DET(ERMINER) and REST(RICTED)

IND(EX). The DET attribute takes as its value sort *sem(antic-)det(erminer)* such as *forall*, *exist*, *the*, *few*, etc., while the RESTIND takes sort *nom(inal)-obj(ect)*, which in turn has the INDEX and RESTR(ICTION) attribute. (See chapter 8 of Pollard and Sag (1994) for more detailed discussion.) Pollard and Yoo (1995) extend the QSTORE mechanism to handle the *wh*-scopes as well as quantifier scopes. On this approach, for example, the *wh*-operator *whom* has the feature structure in (78a), which indicates that *whom* is a quantifier that has *which* as its *semdet* and its referent must be a person. The QSTROE value is often abbreviated as in (78b).

```
(78)  a. +-             +-  +-                      -+-+            -+
         |SYNSEM|LOC|CAT|HEAD noun CASE acc| |            |
         |               |   +-            -+ | |            |
         |               |VAL|SUBJ < >  |  | |            |
         |               |   |COMPS < >|  | |            |
         |               |   |SPR < >  |  | |            |
         |               +-  +-            -+ -+|            |
         |                                       |
         |               |CONTENT|INDEX [1]          -+|            |
         |               +-                              |
         |               +-                                    -+
         |QSTORE  {      |DET which                          -+  |}
         |               |      +-                                |  |
         |               |RESTIND|INDEX [1]                      |  |
         |               |       |          +-           -+      |  |
         |               |       |RESTR  |RELN person  |      |  |
         |               |       |       |INSTANCE [1]|      |  |
         +-        quant+-       +-       +-           -+ -+ -+-+ -+
```
      b. {[which [1] | person ([1])]}

The value of QSTORE is structure-shared with the mother node by the Quantifier Inheritance Principle (QIP):

(79)   Quantifier Inheritance Principle (QIP):

The QSTORE value of a phrasal node is the union of the QSTORE values of the

daughters less those quantifiers that are retrieved at that node.

(79) states that the QSTORE value of a daughter node can be percolated up to the mother

node until it is retrived. The retrieval of a quantifier can take place at any phrasal node

whose CONTENT is a psoa (roughly, at any verbal phrasal category). Based on this

QSTORE mechanism, Pollard and Yoo (1995) define the notion of the operator-complex

(O-complex) as follows:

(80)   An O-complex is a constituent whose QSTORE contains a non-definite quantifier

or a *wh*-operator.

According to the definition in (80), a quantifier such as *everyone* or a *wh*-word itself is

an O-complex since its QSTORE contains a non-definite quantifier or a *wh*-operator. An

NP containing a quantifier or a *wh*-word like *every mother* or *whose mother* can also be

an O-complex since the QSTORE value in the specifier daughter is percolated up to the

mother node by the QIP in (79), and thus the whole NP's QSTORE also contains the

same quantifier or *wh*-operator as the specifier has.

Based on the notions such as proper o-command in (74) and proper precedence

in (75), the sort hierarchy in (77), and the definition of O-complex in (80), we propose

the variable binding conditions in (81) and (82) for each pronoun.[15][16]

(81)   Variable binding condition of *x-pronoun*:

An x-pronoun X may be bound by an operator O only if

either (i) O properly o-commands X

or   (ii) O-complex properly precedes X.

(82)   Variable binding condition of *y-pronoun*:

A y-pronoun Y may be bound by an operator O only if

O-complex properly precedes Y.

(81) states that x-pronouns such as *pro* and non-locally bound *caki* can be bound by an

operator if either (i) the operator is less oblique than the constituent properly dominating

the x-pronouns; or (ii) the operator itself or a node dominating the operator precedes a

constituent properly dominating the x-pronoun. (82) states that the y-pronoun *ku* can be

_____

[15]The condition in (81) may be considered as a descriptive generalization because
it is a disjunction of two separate cases. The formulation through a deeper generalization
remains for further study, if such a generalization exists.

[16]We may simplify the notion of "proper precedence" in (81) and (82) into
standard "precedence" if we rule out the examples in (68) by principle B. To this end,
we may assume that the index value of the operator percolated up to the mother node also
affects the binding possibilities, following Safir's (to appear) slash indexing technique.
That is, in (68a) for example, the QSTORE value of the whole NP, *nwukwu-uy kwake-ka*
'whose past' contains the index of the operator *nwukwu-uy* 'whose' due to the QIP. If the
index is assumed to be available for the binding theory, then (68a) can be eliminated by
principle B, i.e., the pronouns are locally p-commanded by the whole NP [*nwukwu-uy*$_i$
[*kwake-ka*$_j$]]$_{i/j}$ 'whose past'. However, technical details remain for further study.

bound by an operator if the operator itself or a node dominating the operator precedes a constituent properly dominating the y-pronoun. (81i) and (81ii) have similar effects as the LF reconstruction and reanalysis in Saito (1992), respectively. However, they make different predictions from Saito's c-command based approaches in that all the problematic data given above are no longer problems.[17]

As for (59) and (60), on our approach, the (a) sentences are all correctly predicted to be unacceptable because the operators *nwukwu-lul* 'who' and *nwukwuna-lul* 'everyone' neither properly o-command nor properly precede the pronominals. (63b) is predicted to be unacceptable by the same reason if we assume that an adjunct and a complement are equally oblique. In contrast, the (b) sentences in (59) and (60) are all correctly predicted to be acceptable because the operators properly precedes the pronominals. (63a) is also predicted to be acceptable by the same reason.

Binding possibilities of (61), (62), (67), (72) and (73) are not determined by the operator binding conditions in (81) and (82) because the binders are definites, not operators. We will return to these examples shortly.

As for *caki* and *pro* binding in (65) and (66), all the relevant sentences are correctly predicted to be acceptable regardless of positions of the pronominals and operators, because the operators properly o-command the pronominals. As for *ku* binding, the relevant (a) sentences are correctly predicted to be acceptable because the operators properly precedes *ku*. In contrast, the relevant (b) sentences are correctly predicted to be

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[17]Chomsky (1976), Gawron and Peters (1990), Bresnan (1995), and Williams (in press) among others also propose that linear precedence is a crucial determining factor of operator binding.

unacceptable. The operators do not properly precede the pronominals, and thus the condition in (82) is violated.

As for (68) and (69) as well as (70b) and (71b), all of them are correctly predicted to be unacceptable because the operator neither properly o-commands nor properly precedes the pronominals. In contrast, (70a) and (71a) are correctly predicted to be acceptable since the operator properly precedes the pronominals.

Note that the binding conditions in (81) and (82) are formulated as a necessary condition but not as a necessary and sufficient condition. On our nonconfigurational approach, operator binding is conjunctively conditioned (i) by minimal syntactic constraints in (81) and (82); and (ii) by discourse and/or processing factors. In other words, for a pronominal to be appropriately bound by an operator, it must satisfy certain discourse or processing conditions as well as syntactic conditions. Thus on our approach, syntactic conditions alone may allow some sentences to be overgenerated, but they are filtered out by some discourse or processing conditions. For example, let us consider the following examples:

(83) [Nwukwu$_i$-uy yeca chinkwu]-ka   [*caki$_i$-/ku$_i$-uy/pro$_i$ pwumonim]-ul
       who-Gen girl friend-Nom   self-/he-Gen/pro parents-Acc
       pangmwunhayssni?
       visited
       'Whose$_i$ girl friend visited his$_i$ parents?'

The only difference between the sentences in (70a) and (83) is that the head noun of the NP containing the operator *nwukwu* 'who' is replaced with a person, *yeca chinkwu* 'girl

friend'. In this case, *caki* is bound not by *nwukwu* but by *yeca chinkwu*. On our analysis, the sentence in (83) satisfies the binding conditions in (81) and (82), and thus they are all predicted to be acceptable at the syntax level. However, *caki* binding here is filtered out by a certain processing factor, namely the intervention effect, which is one of the two crucial factors that are suggested by Pollard and Sag (1992, 1994) to be relevant to binding of non-locally bound anaphor. The intervention effect can roughly be described as follows: a non-locally bound anaphor X is hard to interpret as coindexed with an NP Y when another NP W which can be a possible antecedent of X linearly intervenes between X and Y. From the perspective of intervention, the unacceptability of the sentence in (83) with *caki* is correctly predicted if we assume that a linear intervention effect occurs when *yeca chinkwu* 'girl friend' appears between *caki* and its binder. In this thesis, we have focused on what minimal syntactic conditions must be imposed on each pronominal. As for more discussions on such non-syntactic factors, we refer readers to some previous studies that will be listed below when we briefly discuss non-operator binding.[18]

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[18]Cole, Herman and Sung (1990), Huang and Tang (1991), and Progovac (1992) among others propose some syntactic accounts of the intervention effects (or blocking effects) on Chinese *ziji* 'self' binding, based on feature agreements. However, Xue, Pollard and Sag (1995) convincingly claim that none of those syntax-based accounts are plausible. Aikawa (1993) also proposes a syntactic account of an intervention effect on Japanese *zibun* 'self' binding, based on honorific feature agreement, i.e., when there is a subject that triggers subject honorification, the long-distance binding of *zibun* by its higher subject is impossible. Whatever the involved feature is, however, it is unclear how this type of syntactic constraint can be extended to account for the intervention effect in (83), where *caki* on the one hand, and the binder *nwukwu* 'who' and the intervenor *yeca chinkwu* 'girl friend' on the other are properly dominated by separate NPs. Also note that the honorific constraint suggested by Aikawa does not exist in Korean.

Now, let us consider examples where pronouns are bound by non-operators such as proper nouns and definites, as in (53), (61), (62), (67), (72) and (73). First of all, in general, non-operator binding of a pronominal seems to be similar to operator binding in that possibilities of non-operator pronominal binding is also affected by the obliqueness hierarchy (e.g., (67)) and linear order (e.g., (61), (72) and (73)).[19] However, the conditions in terms of obliqueness and linear order in (81) and (82) are not even necessary conditions for non-operator binding. For example, even though the NP dominating *caki* in (53a) or the NP dominating *pro* in (61a) and (62b) are not o-commanded or preceded by its antecedent, they are perfectly acceptable.

Then what conditions are imposed on non-operator pronominal binding? Following Reinhart (1983) and Roberts (1994) among others, we assume that possibilities of non-operator binding are determined not by syntactic factors but by discourse factors. Discourse factors that have often been discussed in pronominal binding are as follows: point of view or empathy (Kuno (1976), Tomabechi (1989)), logophoricity (Sells (1987)), discourse salience of an antecedent in terms of a kind of obliqueness hierarchy (Brennan, Friedman and Pollard (1987), Walker, Cote and Iida (1994)), discourse salience of an antecedent in terms of familiarity (Roberts (1994)), among others. As mentioned above, we will avoid any further discussion about these factors since they are beyond the scope of this thesis. Instead, we will just roughly sketch how a certain discourse constraint is

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[19]However, non-operator binding is less restrictive than operator binding in the sense that a non-operator embedded within an NP can bind a pronominal even when the pronominal is not embedded within another NP. Compare (72a) and (73b) with (68a) or (69a).

imposed on non-operator binding, based on Roberts (1994).

Heim (1982) proposes that a difference between definites and indefinites arises from their distinct presuppositions. Definites have familiarity presuppositions, while indefinites have novelty presuppositions. According to her theory, the familiarity presupposition is satisfied when the index of the referent of a definite is a member of the presuppositional set involved. Roberts (1994) discusses some instances of pronoun binding in English, proposing that binding possibilities of non-operator pronoun binding are determined by discourse salience of an antecedent. According to her, one of the crucial factors that makes the antecedent salient at the discourse level is its familiarity to interlocutors. Following Heim's theory of familiarity presupposition, she proposes that a discourse bound pronoun is bound by an index of an element in a presuppositional set, not by an overt NP within the clause. Following her, we can assume that pronominals such as *caki* and *pro* in (53), (61), (62), (67), (72), and (73) are bound not by an overt NP within the clauses but by an index in a presuppositional set in the sense of Heim (1982). That is, those sentences are felicitously uttered only when a presupposition that the referent of a definite antecedent is familiar to the interlocutors.[20]

The familiarity presupposition may be considered as a necessary condition on non-operator binding but not as a sufficient condition, because satisfaction of the familiarity presupposition does not always make non-operator binding possible. For example, note that the binding possibilities of *caki* are more restrictive than that of *pro*, as shown in

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[20]Heim (1982) does not discuss whether a proper noun such as *John* in (61) and (62) is a definite or not. We assume that a proper noun also has the familiarity presupposition.

(61a). Here the antecedent NP is an object and linearly follows the pronominals *caki* and *pro*. In this case, even though the familiarity presupposition is satisfied, *caki* cannot be bound by the NP, while *pro* can. However, when the antecedent is a subject, as in (67b), *caki* also can bound by it. This contrast shows that we may need to consider more discourse factors for *caki* binding, such as empathy or point of view. According to Kuno's (1976) empathy hierarchy, it is easier for speakers to empathize with the referent of a subject than an object. It is generally well-accepted that the binding possibilities of non-locally bound *caki* are affected by this kind of empathy hierarchy. Then we can say that, due to the subjecthood of the antecedent, *caki* in (67b) can be bound by the antecedent, even though the antecedent follows it. In contrast, due to the non-subjecthood of the antecedent, it is hard for *caki* in (61a) to be bound by the antecedent when the antecedent follows it.

Also note that the pronominal *ku* does not seem to be affected by (in)definiteness of the binder. As shown in (61a), (67b), (72b) and (73a), *ku* cannot be bound by a linearly following binder regardless of the (in)definiteness of the binder. This fact provides another motivation for the sort hierarchy in (77) where the y-pronoun *ku* differs from x-pronouns such as *caki* and *pro*. To incorporate the observation on *ku* into the condition in (82), (82) may be revised into a more general condition as in (84):

(84)   Binding condition of y-pronoun

A y-pronoun Y may be bound by an NP X only if

X properly precedes Y.

To summarize, Korean may have the WCO effect at least at LF (e.g., (59a) and

(60a)). The WCO and relevant phenomena can be relatively well accounted for by the

operator binding condition for *caki* and *pro* in (81) and the binding condition for *ku* in

(84), which are formulated in nonconfigurational terms such as obliqueness and linear

precedence, rather than by the reconstruction and reanalysis in Saito (1992). This leads

us to the conclusion that the putative WCO effect in Korean can neither be evidence that

a VP node exists nor be evidence that scrambling is an instance of move-α.

2.1.8. Floated Quantifiers

Restrictions on scrambling of floated quantifiers (FQs) have often been discussed as

evidence for the VP node (Saito (1987), Miyagawa (1989), and Yatabe (1993), among

others). In Korean and Japanese, numeral quantifiers that are semantically related to

argument NPs such as a subject, a primary object and secondary object can be floated

around with certain amount of word order freedom. However, FQ scrambling seems to

have certain systematic syntactic constraints, and it is claimed that a hierarchical structure

needs to be posited to account for the constraints on scrambling of FQs. This section is

organized as follows. First, we will describe patterns of FQ scrambling case by case.

Then we will review two configurational approaches to FQs (Miyagawa (1989) and

Yatabe (1993)), showing their problems. And we will propose our own analysis of FQs

in a flat structure.

2.1.8.1. Distribution of Floated Quantifiers

A subject and its FQ cannot be separated by a complement, as shown in (85) and (86):

(85)　a.　Haksayng-i　　sey-myung　　chayk-lul　sassta.
　　　　　student-Nom　three-person　book-Acc　bought

　　　　　'Three students bought a book.'

　　　b.　Sey-myung　　haksayng-i　　　chayk-lul　sassta.
　　　　　three-person　student-Nom　　　book-Acc　bought

　　　c.　*　Haksayng-i　chayk-lul　sey-myung　　sassta.
　　　　　　　student-Nom　book-Acc　three-person　bought

　　　d.　*　Sey-myung　　chayk-lul　haksayng-i　　sassta.
　　　　　　　three-person　book-Acc　student-Nom　bought

(86)　*Haksayng-i　sensayngnim-hanthey　　sey-myung　　phenci-lul　ponayssta.
　　　　student-Nom teacher-to　　　　　　　three-person　letter-Acc　sent
　　　　'Three students sent a letter to their teacher.'

However, they can be separated by an adjunct, as shown in (87):

(87)　a.　Haksayng-i　ecey　　　sey-myung　　ku chayk-lul　sassta.
　　　　　student-Nom　yesterday　three-person　the book-Acc　bought

　　　　　'Three students bought the book yesterday.'

　　　b.　Ku chayk-lul　haksayng-i　　ecey　　　sey-myung　　sassta.
　　　　　the book-Acc　student-Nom　yesterday　three-person　bought

A primary object (PO) and its FQ can be separated by any argument or adjunct.

That is, there is no constraint on scrambling of PO oriented FQs, as shown in (88)-(90):

(88) a. Haksayng-i   ku chayk-lul   twu-kwen   sassta.
student-Nom   the book-Acc   two-volume   bought

'A student bought two books.'

b. Haksayng-i   twu-kwen   ku chayk-lul   sassta.
student-Nom   two-volume   the book-Acc   bought

b. Ku chayk-lul   haksayng-i   twu-kwen   sassta.
the book-Acc   student-Nom   two-volume   bought

(89) Mary-ka   ku chayk-ul   chinkwu-hanthey   twu-kwen   ponayssta.
M-Nom   the book-Acc   teacher-to   two-volume   sent
'Mary sent two books to (her) friend.'

(90) Haksayng-i   ku chayk-lul   ecey   twu-kwen   sassta.
student-Nom   the book-Acc   yesterday   two-volume   bought
'A student bought two books yesterday.'

It gets complicated when we consider a secondary object (SO) oriented FQ. First

of all, as long as they are adjacent, the FQ can precede or follow the SO:

(91) a. Mary-ka   chinkwu-hanthey   sey-myung   phyenci-lul   ponayssta.
M-Nom   friend-to   three-person   letter-Acc   sent

'Mary sent a letter to three friends (of hers).'

b. Mary-ka   sey-myung   chinkwu-hanthey   phyenci-lul   ponayssta.
M-Nom   three-person   friend-to   letter-Acc   sent

They can be separated by a subject or adjunct in certain circumstances, as shown in (92)

and (93):

(92) a. Chinkwu-hanthey   Mary-ka   sey-myung   phyenci-lul   ponayssta.
friend-to   M-Nom   three-person   letter-Acc   sent

'Mary sent a letter to three friends (of hers).'

b. Sey-myung   Mary-ka   chinkwu-hanthey   phyenci-lul   ponayssta.
three-person   M-Nom   friend-to   letter-Acc   sent

(93) a. Mary-ka   chinkwu-hanthey   ecey   sey-myung   phyenci-lul   ponayssta.
M-Nom   friend-to   yesterday   three-person   letter-Acc   sent

'Mary sent a letter to three friends (of hers) yesterday.'

b. Mary-ka   sey-myung   ecey   chinkwu-hanthey   phyenci-lul   ponayssta.
M-Nom   three-person   yesterday   friend-to   letter-Acc   sent

However, they cannot be separated by a subject or adjunct when the PO precedes

the SO, as shown in (94) and (95):

(94) a. ?? Ku phyenci-lul   chinkwu-hanthey   Mary-ka   sey-myung   ponayssta.
the letter-Acc   friend-to   M-Nom   three-person   sent

'Mary sent the letter to three friends (of hers).'

b. * Ku phyenci-lul   sey-myung   Mary-ka   chinkwu-hanthey   ponayssta.
the letter-Acc   three-person   M-Nom   friend-to   sent

(95) a. ?? Ku phyenci-lul   Mary-ka   chinkwu-hanthey   ecey
the letter-Acc   M-Nom   friend-to   yesterday
sey-myung   ponayssta.
three-person   sent

'Mary sent the letter to three friends (of hers) yesterday.'

b. * Ku phyenci-lul   Mary-ka   sey-myung   ecey
the letter-Acc   M-Nom   three-person   yesterday
chinkwu-hanthey   ponayssta.
friend-to   sent

They also cannot be separated by a PO, as shown in (96):

(96) a. * Mary-ka   chinkwu-hanthey   phyenci-lul   sey-myung   ponayssta.
        M-Nom   friend-to   letter-Acc   three-person   sent

     'Mary sent a letter to three friends (of hers).'

   b. * Mary-ka   sey-myung   phyenci-lul   chinkwu-hanthey   ponayssta.
        M-Nom   three-person   letter-Acc   friend-to   sent

   c. * Chinkwu-hanthey phyenci-lul   Mary-ka   sey-myung   ponayssta.
        friend-to   letter-Acc   M-Nom   three-person   sent

Based on these observations, we will review Miyagawa's (1989) and Yatabe's (1993) analyses of FQs in the following section, which claim that it is necessary to assume hierarchical clause structures in order to account for constraints on FQ's scrambling.

2.1.8.2. Configurational Approaches and Their Problems

Miyagawa (1989) assumes the following constraints to account for the facts that a subject and a subject oriented FQ are not separable by a complement (e.g., (85c,d) and (86)), while a PO and a PO oriented FQ are separable by a subject (e.g., (87)-(90)):

(97) a. A complement can be scrambled leftward but a subject cannot.

   b. An FQ (or its trace) and its host (or its trace) can be semantically related to each other only if they c-command each other.

   c. An FQ can scramble leftward only when it modifies an NP with an "affected theme role".

On this approach, a structure like (98) can be derived:

(98) $[_s \text{ Obj}_i \ [_s \text{ Subj } [_{vP} \text{ t}_i \text{ FQ V}]]]$

In (98), the FQ is interpretable only as an object oriented FQ since the trace of the object and FQ c-command each other, whereas the subject and FQ do not. On this account, if we assume a flat structure like (99), the subject and FQ c-command each other, and the sentence in (85c) is incorrectly predicted to be well-formed.

(99) $[_s \text{ Subj Obj FQ V}]]$

As pointed out by Yatabe (1993), one of the problems with Miyagawa's approach is that it does not make correct predictions about quantifier floating out of SO, illustrated in (96c) for example. On Miyagawa's account, it is possible to assume the structure in (100) to derive (96c), and hence (96c) is incorrectly predicted to be acceptable, i.e., t_i and FQ c-command each other.

(100) $[_s \text{ SO}_i \ [_s \text{ PO}_j \ [_s \text{ Subj } [_{vP} \text{ t}_i \text{ FQ } t_j \text{ V}]]]]$

Another problem arises from the stipulation in (97c). Miyagawa posits (97c) to account for the ungrammaticality of (85d). According to (97c), the FQ *sey-myung* 'three people' cannot scramble leftward since the NP modified by the FQ does not have an affected theme role here. However, the stipulation in (97c) has empirical problems. As pointed out by Yatabe (1993) and Fukushima (1991a,b), it is not true that only an FQ modifying an affected theme role can scramble leftward. For example, in (92b), the FQ *sey-myung* 'three people' does not modify an affected theme role but can scramble leftward. Then, we may need to revise (97c) to something like (97c)' below to rule out (85d):

(97)' c. An FQ can scramble leftward only when it modifies an NP with an "affected theme role" or "recipient role".

In any case whether (97c)' is a correct constraint in Miyagawa's analysis, the constraint in (97) suggests that the distribution of FQs cannot be determined sorely by the notion of "mutual c-command", and that another concept such as thematic roles needs to be introduced. But then perhaps we should consider another approach where the thematic role, rather than c-command, plays the major role in the account of FQ scrambling.

Yatabe (1993) proposes that the distribution of FQs can be correctly constrained by a condition on association of FQs with thematic argument slots in predicates. Following Gunji (1988) and Sells (1990), he assumes that (i) in Japanese a predicate can combine with its arguments in any order, without reference to the obliqueness hierarchy

and (ii) that the phrase structure of Japanese is not necessarily flat or binary-branching. Each predicate has thematic slots such as <agent, theme>, and each slot is discharged when the predicate combines with the argument corresponding to each slot. The thematic hierarchy he assumes is (101):

(101) agent > beneficiary > recipient/experiencer > instrument > location > manner > theme > patient (Yatabe (1993): 33)
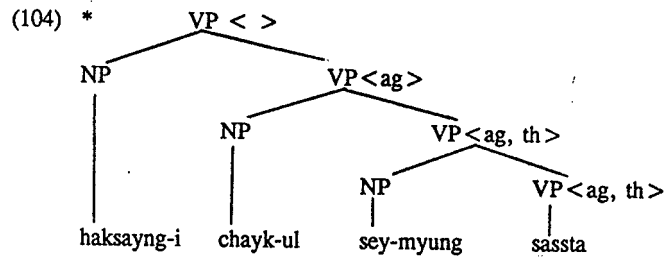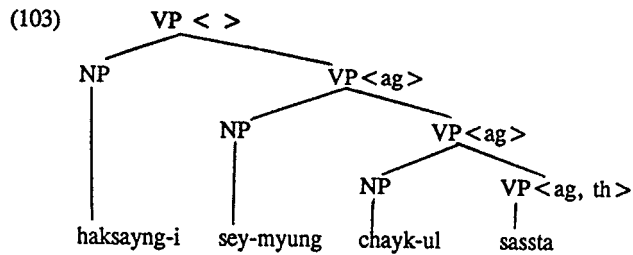
He also assumes a constraint on association of an FQ with a thematic argument slot of a predicate, which is stated in (102):

(102) An FQ can be associated only with the thematically lowest argument slot of the predicate that it combines with.

On this approach, the contrast between (85a) and (85c) is correctly predicted. (103) and (104) are the structures for (85a) and (85c), respectively.[21]
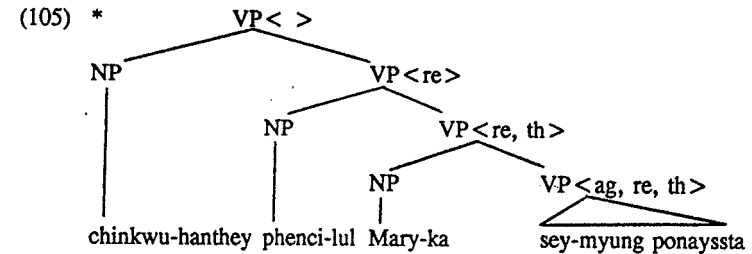
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[21]Another analysis of (85a) will be discussed shortly.

(103)

```
              VP < >
         /            \
       NP              VP<ag>
        |          /          \
        |        NP            VP<ag>
        |         |        /          \
        |         |      NP            VP<ag, th>
        |         |       |                |
   haksayng-i  sey-myung  chayk-ul       sassta
```

(104) *

```
              VP < >
         /            \
       NP              VP<ag>
        |          /          \
        |        NP            VP<ag, th>
        |         |        /          \
        |         |      NP            VP<ag, th>
        |         |       |                |
   haksayng-i  chayk-ul  sey-myung       sassta
```

The FQ in (103) is associated with the predicate *chayk-lul sassta* 'bought a book' whose argument list is <ag>. In this case, constraint (102) is not violated because the Agent can be considered to be thematically lowest in the singleton list. Hence (85a) is correctly predicted to be acceptable. In contrast, in (104), the FQ *sey-myung* 'three people' combines with a predicate *sassta* 'bought' whose argument list is <ag, th>. The association constraint in (102) says that in this case the FQ must be associated with the Theme because it is thematically lower than the Agent. However, the FQ is actually associated with the Agent in (85c), and it is correctly predicted to be unacceptable.

The ill-formedness of the sentence in (96c), which is problematic for Miyagawa (1989), is correctly predicted on Yatabe's approach. One of the structures of (96c) is as

follows:

(105) *

```
                    VP< >
              /            \
            NP              VP<re>
             |          /          \
             |        NP            VP<re, th>
             |         |        /          \
             |         |      NP            VP<ag, re, th>
             |         |       |             /‾‾‾‾‾\
   chinkwu-hanthey  phenci-lul  Mary-ka    sey-myung ponayssta
```

In (105), the FQ *sey-myung* 'three people' combines with a predicate whose list of thematic arguments is <ag(ent), re(cipient), th(eme)>. This structure is problematic because the FQ is associated with the Recipient, which is thematically not the lowest role in the list. Even if a flatter or totally flat structure is assumed, the situation is the same.

We agree with Yatabe's (1993) proposal that the crucial factor determining the distribution of FQs is relative order in the thematic hierarchy of the arguments hosting FQs, rather than the notion of c-command. However, we disagree with the association constraint in (102) which requires the clause to be hierarchical in some cases. A problem with Yatabe's analysis arises from sentences like (106).

(106) Chayk-lul haksayng-i   sey-myung   sassta.
       book-Acc student-Nom three-person bought
       'Three students bought books.'

(106) differs from (85a) only in that the object precedes the subject. However, the

constraint in (102) incorrectly predicts (106) to be unacceptable. I.e., the FQ *sey-myung* 'three people' should combine with the predicate *sassta* 'bought', whose list of thematic arguments is <ag, th>, and should be associated with the lowest thematic slot, namely the Theme. However, the FQ is actually associated with the Agent in (106), which is fully acceptable.

To avoid this apparent problem, Yatabe claims that *sey-myung* 'three people' in (94) is not a FQ, but part of the larger NP constituent, [$_{NP}$ [$_{NP}$ haksayng-i] [$_{NP}$ sey-myung]] 'three students'. To support his claim, he provides sentences like (107) where the string *haksayng-i sey-myung* is conjoined with an ordinary NP by the conjunction *hako* (*to* in Japanese). He argues that these examples cannot be analyzed as an instance of non-constituent coordination because (i) the nominative marker -*i* or -*ka* is adjoined to the right of the entire coordinate structure (e.g., (107a)), and (ii) the conjunction *hako* attaches to the right edges of conjuncts (e.g., (107b)).

(107) a. [[[Haksayng-i   sey-myung]   hako] [han-myung-uy   sensayng]]-i
         student-Nom   three-person and   one-person-Gen   teacher-Nom
         chephotoyessta.
         be-arrested

     'Three students and one teacher were arrested.'

   b. [[[Haksayng-i   sey-myung]   hako] [han-myung-uy   sensayng
         student-Nom   three-person and   one-person-Gen   teacher-Nom
         hako]]-ka   chephotoyessta.
         and-Nom   be-arrested

However, contrary to Yatabe's argument, we can find examples such as (108)

which have exactly the same string pattern as the examples in (107), but are instances of non-constituent coordination.

(108) a. Mary-hanthey   banana   hako   John-hanthey sakwa-lul
          M-to   banana   and   J-to   apple-Acc
          (senmwul-lo) cwuessta.
          gift-as   gave

     '(I) gave a banana to Mary (as a gift) and an apple to John.'

   b. Mary-hanthey   banana   hako   John-hanthey sakwa hako-lul
          M-to   banana   and   J-to   apple and-Acc
          (senmwul-lo) cwuessta.
          gift-as   gave

At present, we remain uncommitted as to how this kind of non-constituent coordination should be analyzed. However, it is obvious that the examples in (108) are problematic for Yatabe's analysis because they leave open the possibility that the sentences in (107) may be instances of non-constituent coordination, and thus, weaken his argument that the string *haksayng-i sey-myung* forms a constituent.

Another problem with Yatabe's analysis of (106) is that an adverbial expression can intervene between the FQ and the host NP, as shown in (109) (=(87b)):

(109) Ku chayk-lul haksayng-i   ecey   sey-myung   sassta.
      book-Acc   student-Nom yesterday three-person bought
      'Three student bought the book yesterday.'

Yatabe notices this problem and argues that (109) is not a real problem because it can be

analyzed as an instance of Right Node Raising (RNR). I.e., he assumes that (109) consists of two clauses *chayk-lul haksayng-i sassta* 'students bought a book' and *cikumkkaci [pro sey-myung] sassta* 'so far three of them have bought (it)', out of which the verb *sassta* 'bought' is right-node raised.[22] However, this RNR analysis of (109) is very suspicious for the following reason. If (109) really consists of two clauses, it must be also acceptable when an overt conjunction such as *kuliko* 'and' appears there. However, this prediction is not borne out, since (110) is totally unacceptable:

(110) * Chayk-lul haksayng-i   kuliko ecey   sey-myung sassta.
        book-Acc student-Nom and   yesterday three-person bought
        Lit. 'Students bought books and yesterday three of them have bought (them).'

To support his RNR analysis, Yatabe says that it can account for the fact that the unacceptable sentence in (85c) improves when there is an adjunct between the object and the FQ, as illustrated in (111):

(111) (?)   Haksayng-i   chayk-lul cikumkkaci sey-myung sassta.
            student-Nom book-Acc so-far   three-person bought
            'So far three students have bought a book today.'

---

[22] As far as we know, this kind of analysis is usually called gapping. Here the extracted constituent or the common factor of the both clauses is the head verb, and the extracted head verb and the gap cannot be in unbounded dependency relationship, which are typical properties of gapping. In RNR, in contrast, the extracted constituent is a non-head and unbounded dependency is possible between the extracted non-head and the gap.

According to him, since RNR requires a certain parallelism between two conjuncts, *[haksayng-i chayk-lul] [cikumkkaci sey-myung] sassta* (=(111)) must be preferable to *[haksayng-i chayk-lul] [sey-myung] sassta* (=(85c)), in that (111) is a coordination where each conjunct contains two overt maximal phrases, whereas (85c) is a coordination where the first conjunct contains two overt maximal phrases, but the second conjunct contains only one overt maximal phrase.

Yatabe's account of (111) is not convincing because his reasoning is based on a dubious assumption that parallelism just in the number of maximal phrases in each conjunct is enough to improve an unacceptable sentence, regardless of the parallelism in grammatical categories and functions of the phrases. In apparent cases of RNR or gapping, parallelism just in the number of the phrases does not improve acceptability, as illustrated in (112):

(112) * [Mary-hanthey   banana-lul]   kuliko [John-hanthey   onul]   cwuessta.
        M-to   banana-Acc   and   J-to   today   gave
        Lit.'(I) gave Mary a banana and John today.'

Also note that Yatabe's account predicts (111) not to improve if the second conjunct contains two adjuncts, since the parallelism does not obtain. However, this prediction is not borne out because (113) is as good as (111):

(113) (?) [Haksayng-i chayk-lul] [cikumkkaci nolapkeyto sey-myung]
           student-Nom book-Acc   so-far   surprisingly three-person
           sassta.
           bought
           'So far surprisingly three students have bought a book today.'

What is really involved in the improvement in (111) or (113) seems to be contrastive focus. As proposed in Gunji (1991), the introduction of the adjunct *cikumkkaci* 'so far' brings in a contrastive reading. That is, (111) can have the following implication: e.g., the number of the students who have bought a book so far is three, but the number is surprisingly small, considering the author's reputation.

Yatabe disagrees with Gunji's account because the sentences such as (114) seems to be a counterexample.

(114) ??/* Haksayng-i   wisky-lul   byungchaylo-nun   sey-myung   masyessta
            student-Nom whiskey-Acc by-the-bottle-Cont three-person drank
            'Three students drank whiskey by the bottle, (but the others did not do so
            by the bottle).'

In (114), *-nun* in the adjunct *pyungchaylo-nun* 'by the bottle' introduces a contrastive reading, but (114) is not as good as (111) or (113). However, (114) does not seem to be a real counterexample, because the acceptability of the same sentence is much improved in a more obvious contrastive context, as shown in (115):

(115) (?) Haksayng-i   wisky-lul   byungchaylo-nun   sey-myung
           student-Nom wiskey-Acc by-the-bottle-Cont three-person
           masyess-ko, cupulo-nun   twu-myung masyessta.
           drank-and   by-the-cup   two-person drank
           'Three students drank wiskey by the bottle, and two students did by the
           cup.'

From (114) and (115), we can say that (114) is worse than (115) simply because it is harder to imagine an appropriate contrastive context where (114) can be felicitously uttered.

Gunji's proposal is further supported by the improved acceptability of (116) compared with (114), where the focus delimiter *-man* 'only' is attached to the FQ to assign a focus reading to the FQ:

(116) (?) Haksayng-i   wisky-lul   sey-myung-man masyessta.
           student-Nom wiskey-Acc three-person-only drank
           'Only three students drank wiskey.'

Another problem for Yatabe (1993) (and perhaps also for Miyagawa (1989)), arises from the semantics of FQs. Following Dowty and Brody (1984), Fukushima (1991a,b) convincingly argues that an FQ is an adverb which modifies the verbal predicate, rather than the so-called host argument. The adverbial property of the FQ is not clear from the above examples because there is no truth conditional meaning difference between the FQ's adverbial reading and prenominal reading. However, if we change the predicate, the meaning difference arises, as shown in (117):

(117) Cwuy-ka   twu-mali   nulenassta.
      mouse-Nom   two-animal   increased
      '(The number of) mice increased by two.'
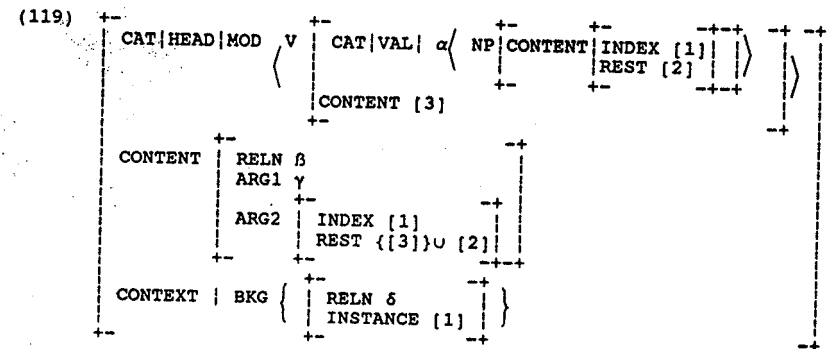
(118) Mary-ka   lophu-lul   sam-inch   calassta.
      M-Nom   rope-Acc   three-inch   cut
      'Mary cut the rope by three inches.'

Note that the sentences in (117) and (118) have only one reading, which entails that the FQ in (117b) and (118) modifies a verb not an NP. In other words, as shown in the translations, the sentences do not have interpretations where the FQ modifies the host NP, i.e., 'two mice increased (to a certain number)' for (117), or 'Mary cut three inch rope' for (118). However, if the FQ immediately following the host noun is analyzed as a sub-constituent of the larger NP [cwuy-ka twu-mali] 'two mice' or [lophu-lul sam-inch] 'three inch rope', as analyzed by Yatabe (1993), it seems to be almost impossible to get the correct interpretation.

To summarize, Miyagawa's c-command approach can account relatively well for FQs which are semantically related to a subject or a primary object (PO). However, Miyagawa's system has overgeneration problems when an FQ of a secondary object (SO) is considered. Also his analysis requires some stipulation through the notion of a thematic role. In contrast, Yatabe (1993) can account relatively well for FQs of a PO or SO, but has a problem when an FQ of a subject is considered. In the following section, we will propose our own analysis of FQs, which explore how the FQs can be handled in a flat structure.

2.1.8.3. Floated Quantifiers in a Flat Structure

Following Fukushima's (1991a,b) suggestion, which is briefly discussed in the previous section, we analyze an FQ as an adjunct modifying a verb and thus as a semantic head of a sentence. On this analysis, a schematic lexical entry of an FQ is as follows:
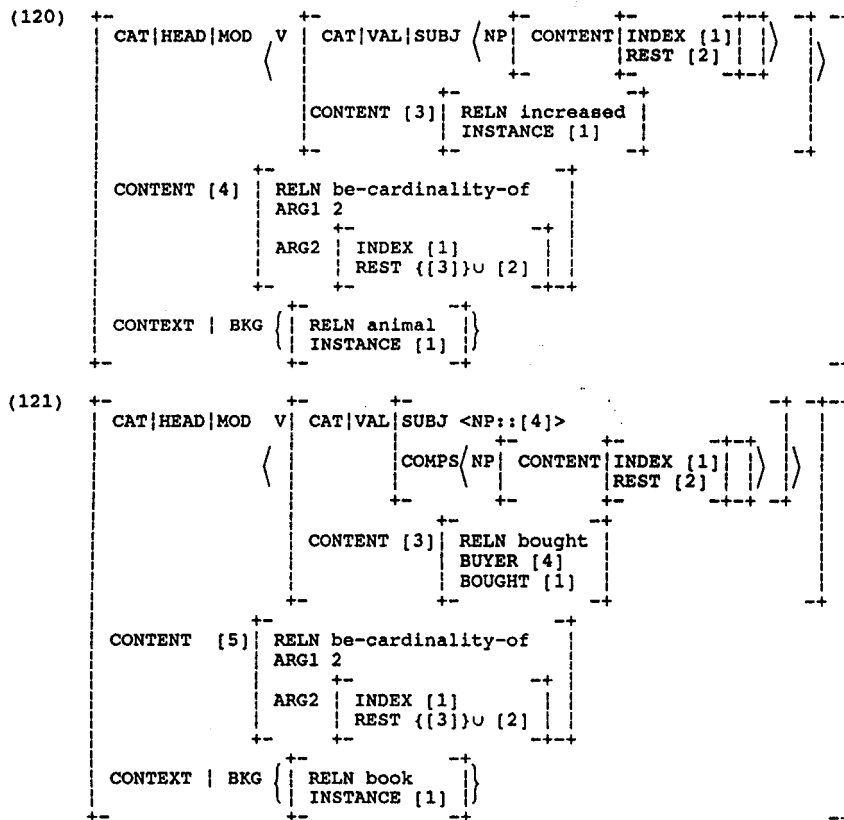
(119)
```
       +-                                                          -+
      | CAT|HEAD|MOD  /V | CAT|VAL| α/ NP|CONTENT| INDEX [1]|  |\  |
      |               \  |                      | REST  [2]|  | / |
      |                  | CONTENT [3]                         |
      |                                                        |
      |          +-                                  -+        |
      | CONTENT | RELN  β                             |        |
      |         | ARG1  γ                             |        |
      |         |    +-              -+               |        |
      |         | ARG2 | INDEX [1]    |               |        |
      |         |      | REST {[3]}∪[2]|              |        |
      |         +-     +-             -+-+            |        |
      |          +-                        -+         |        |
      | CONTEXT | BKG { | RELN  δ      |  }           |        |
      |         |      | INSTANCE [1] |               |        |
      +-        +-     +-             -+              -+
```
(Here α = SUBJ or COMPS
      β = be-cardinality-of, be-amount-of, etc.
      γ = 1,2,3,...,n, 3 inches, 5 liters, etc.
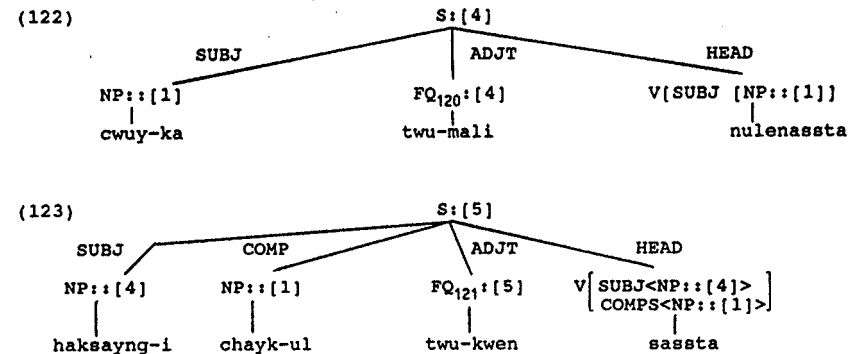   δ = thing, human, book, etc.

(119) roughly states the following: (i) an FQ modifies a verb; (ii) the semantic content of an FQ is a two place function β (e.g., *be-cardinality-of*) whose first argument is a certain cardinality or amount γ, and whose second argument is the CONTENT of an NP which is subcategorized for by the verb and restricted by the CONTENT of the verb; and (iii) an FQ has its own presupposition such as *thing, human*, etc, depending on the classifier attached to the numeral of an FQ. Note that, on this approach, which NP argument is semantically related to the FQ is not specified in a lexical entry. A lexical

entry of an FQ simply indicates that any NP argument can be related to the FQ. The semantic relationship is constrained by a kind of surface filter that will be suggested shortly, and by FQ's presupposition represented by the B(AC)KG(ROUND) information.

According to the schematic lexical entry in (119), the FQs in *twu-mali* 'two animals' in (117) and *twu-kwen* 'two volumes' in (88) have the lexical entries in (120) and (121), respectively:

(120)
```
+-                                                                        -+
|  CAT|HEAD|MOD   V | CAT|VAL|SUBJ / NP| CONTENT|INDEX [1]| |\        |  |\
|                 <  |                |        |REST  [2]| | |>       |  | |>
|                                                                    |  | |
|                   |CONTENT [3]| RELN increased |                   |  | |
|                   |           | INSTANCE [1]   |                   |  | |
|                                                                         |
|    CONTENT [4] | RELN be-cardinality-of |                               |
|                | ARG1 2                 |                               |
|                | ARG2 | INDEX [1]     | |                               |
|                |      | REST {[3]}∪[2]| |                               |
|                                                                         |
|    CONTEXT | BKG { | RELN animal   | }                                  |
|                   { | INSTANCE [1] | }                                  |
+-                                                                        -+
```

(121)
```
+-                                                                    -+
|  CAT|HEAD|MOD   V| CAT|VAL|SUBJ <NP::[4]>                            |
|                 <  |          |COMPS/ NP| CONTENT|INDEX [1]| |\ |\    |
|                    |          |      <  |        |REST  [2]| | |>|>   |
|                                                                      |
|                   | CONTENT [3]| RELN bought |                      |
|                   |            | BUYER [4]   |                      |
|                   |            | BOUGHT [1]  |                      |
|                                                                      |
|    CONTENT  [5]| RELN be-cardinality-of |                           |
|                | ARG1 2                 |                           |
|                | ARG2 | INDEX [1]     | |                           |
|                |      | REST {[3]}∪[2]| |                           |
|                                                                      |
|    CONTEXT | BKG { | RELN book     | }                              |
|                   { | INSTANCE [1] | }                              |
+-                                                                    -+
```

The structures of (117) and (88) where the FQs in (120) and (121) appear are as in (122) and (123), respectively. Here FQ in (120) is abbreviated as FQ_{120} and the FQ in (121) as FQ_{121}.

(122)
```
                                      S:[4]
              SUBJ                    ADJT            HEAD
         NP::[1]                  FQ_120:[4]      V[SUBJ [NP::[1]]]
            |                         |                  |
         cwuy-ka                  twu-mali           nulenassta
```

(123)
```
                                      S:[5]
      SUBJ          COMP              ADJT          HEAD
   NP::[4]        NP::[1]         FQ_121:[5]    V[SUBJ<NP::[4]>  ]
      |              |                |          [COMPS<NP::[1]>]
  haksayng-i     chayk-ul         twu-kwen          sassta
```

Note that an adjunct is a semantic head, which means that the CONTENT value of an FQ, indicated by [4] in (120) and (122) on the one hand, and by [5] in (121) and (123), is identical to that of the mother node, namely of the whole sentence.[23] CONTENT value [4] indicates that something which are mice increased, and that the cardinality of the increased mice is two, while CONTENT value [5] indicates that a student bought something which is a book and that the cardinality of the books that the student bought is two.

---

[23]As discussed in chapter 1, the semantic principle in HPSG is as in (i):

(i) In a headed phrase, the CONTENT value is token-identical to that of the adjunct daughter if the DTRS value is of sort *head-adjunct-struc*, and to that of the head daughter otherwise. (Pollard and Sag (1994): 56))

We did not discuss which NP argument can be semantically related to a given FQ yet. From now on, in order to represent an NP which is semantically related to an FQ, we use the term "host NP" of the FQ. As mentioned earlier, a lexical entry of an FQ simply indicates that any NP argument can be a host of an FQ. However, the semantic relationship is constrained by a kind of surfaces filter and by FQ's presuppositional condition. Let us discuss the presuppositional condition first. The BKG value in the a lexical entry in (120) or (121) contains information about the presupposition of the classifiers. For example, *kwen* in the FQ *twu-kwen* 'two volumes' is a classifier for counting books, which entails that the FQ has a presupposition that its host NP refers to books. Thus our approach can capture the fact that in (124), only the NP *sosel-ul* 'novel' can be a host of *twu-kwen*, but the NP *haksayng-i* 'student' cannot.

(124)   Haksayng-i   sosel-ul   twu-kwen   sassta.
        student-Nom   novel-Acc   two-volume bought
        'A student bought two novels.'

If the FQ is interpreted as hosted by *haksayng* in (124), the sentence cannot be acceptable because the presupposition is not satisfied that the referent of host NP of the FQ is a book. In contrast, if the FQ is interpreted to be hosted by *sosel*, (124) is acceptable because the presupposition is satisfied, i.e., *sosel* refers to a kind of books.

However, the presuppositional constraint alone cannot appropriately account for all the given facts in section 2.1.8.1. For example, it cannot account for the contrast in (85a) and (85c), repeated below:

(85)   a. Haksayng-i   sey-myung   chayk-lul   sassta.
            student-Nom   three-person   book-Acc   bought

            'Three students bought a book.'

        c. * Haksayng-i   chayk-lul   sey-myung   sassta.
               student-Nom   book-Acc   three-person   bought

The FQ *sey-myung* 'three people' in (85) has a presupposition that its host NP argument must refers to human-beings. (85c) with the intended interpretation satisfies the presupposition but is unacceptable. This means that we need another constraint stating that an NP argument in a certain environment cannot be semantically related to a given FQ.

As shown in section 2.1.8.2 above, it is almost impossible to find any simple and elegant configurational constraint that can account for all the given data. We must admit that we could not find a simple and elegant constraint either in a flat analysis. We will just suggest two surface filters in terms of thematic roles of the NP arguments and their surface order with respect to the FQ, which can be considered as descriptive generalizations of the given facts,. We will use thematic roles rather than grammatical relations such as a subject, PO and SO to formulate these constraints because of the examples like (125):

(125)   Cha-ka   tali-lul   twu-tay   kennessta.
        car-Nom   bridge-Acc   two-machine   crossed
        'Two cars crossed the bridge.'

If we consider only grammatical relations and word order, there is no difference between

the acceptable (125) and the unacceptable (85c) repeated above, and both sentences may be incorrectly predicted to have the same acceptability. However, if we consider thematic roles, it is possible to describe differences between them, and thus to account for the fact that they have different acceptability. In Yatabe's (1993) terms, *cha-ka* 'car' in (125) is a Theme and *tali-lul* 'bridge' is a Location, while in (85c), *haksayng-i* 'student' is an Agent and *chayk-ul* 'book' is a Theme.[24]

As for the thematic hierarchy, as discussed in chapter 1, we use the convention in (126) to represent the relative thematic hierarchy among the arguments, with the notions of Proto-Agent Role as in Dowty (1991).

(126) Arguments in the CONTENT attribute are ranked by their positions in the thematic hierarchy, i.e., if an argument A has more Proto-Agent properties than another argument B, A is considered thematically higher than B.

Now, the descriptive generalization involved with the data in section 2.1.8.1 is as follows in terms of thematic roles and word order:

(127) An FQ and its host NP cannot be separated by an argument whose thematic role is lower than that of the host NP.

---

[24]Sentences like (125) are not counterexamples to Miyagawa (1989). He analyzed them as having a VP internal subject at D-structure, and thus the trace of the VP internal subject and the FQ can mutually c-command each other.

The surface filter in (127) can account for most of the data in previous sections. (85a,b) does not violate (127) since nothing intervenes between the FQ *sey-myung* 'three people' and its host NP *haksayng* 'student'. (85c,d) violates it because the FQ and its host NP is separated by another NP argument (*chayk-ul* 'book') whose thematic role is lower than that of the host NP. (86) with the intended interpretation also violates (127) because the FQ and the host NP are separated by another NP argument *sensayngnim-hanthey* 'to a teacher' whose thematic role is lower than the host NP. If it is interpreted as "a student sent a letter to three teachers", then nothing intervenes between the FQ and its host NP *sensayngnim-hanthey*, and thus it is correctly predicted to be acceptable. The sentences in (87) do not violate (127) because (127) does not concern intervention of an adjunct like *ecey* 'yesterday'.

None of the sentences in (88)-(90) violates (127) because the host NP *chayk-ul* 'book' has the lowest thematic role among the arguments of the verb, i.e., it is impossible for an argument whose thematic role is lower than that of the host NP to intervene between the FQ and the host NP.

The sentences in (91) and (106) do not violate (127) since nothing intervenes between the FQ and its host NP. The sentences in (92) do not violate (127) because the FQ and the host NP are separated by an argument whose thematic role is higher than that of the host NP. In (93) and (109), (127) is not violated either because (127) does not concern intervention of an adjunct. In (96), each sentence violates (127) because the FQ and the host NP are separated by the argument *phyenci-lul* 'letter', whose thematic role is lower than that of the host NP.

Note that (127) alone cannot account for some cases of FQ scrambling where the host NP is neither the highest thematic role nor the lowest thematic role among the arguments of the modified verb. For example, the sentences in (94) and (95) are unacceptable even though they do not violate (127). In (94), the FQ *sey-myung* 'three people' and the host NP *chinkwu-hanthey* 'to friends' are separated by the argument *Mary-ka*, whose thematic role is higher than that of the host NP, which does not violate (127). In (95), the FQ and the host NP are separated by an adjunct. We can compare (94) and (95) with (92) and (93). The common property of the unacceptable (94) and (95) is that here an argument with a lower thematic role *phyenci-lul* 'letter' precedes the FQ and the host NP. The involved descriptive generalization here is as follows:

(128)   Unless the host NP has the highest thematic role among the arguments or is adjacent to the FQ, the FQ cannot be preceded by an argument whose thematic role is lower than the host NP.

According to (128), the sentences in (94) and (95) are filtered out because the FQ *sey-myung* 'three people' and its host NP *chinkwu-hanthey* 'to friends' are not adjacent to each other but are preceded by the argument *ku phyenci-lul* 'the letter' whose thematic role is lower than that of the host NP.

The surface filters in (127) and (128) may be understood as constraints on interpretation or processing, which can be overridden or neutralized by certain discourse

factors. On our approach, the sentences in section 2.1.8.1 are all acceptable at the level of syntax because the lexical entry of an FQ is formulated to select any NP argument as its host, as long as the presupposition of the classifier is satisfied. The overgenerated sentences are filtered out at the level of interpretation or processing by (127) and (128). In other words, (127) and (128) describe certain environments where speakers somehow have difficulties in relating an FQ to its host NP. The difficulties can be radically ameliorated by a discourse factor such as contrastive focus. As already discussed in section 2.1.8.2, even though the sentences in (111), (113) and (115) violate the surface filter in (127), they are all acceptable.

We want to conclude this section with pointing out a problem with our analysis. To see the problem, let us consider the cases like (125) where the subject is proposed to have a thematic role lower than the PO's thematic role. In Yatabe (1993), the subject *cha-ka* 'car' in (125) is a Theme and the PO *tali-lul* 'bridge' is a Location. (See (101) for Yatabe's thematic hierarchy.) A problem with our approach is that we cannot assume the thematic ranking assumed in Yatabe, because *cha-ka* 'car' has a Proto-Agent entailment (movement), while *tali-lul* 'bridge' has a Proto-Patient entailment (stationary), with respect to the event of crossing. (See (67) and (68) in section 1.2.4.2 of chapter 1 for the lists of the Proto-Agent and Patient entailments.) To solve this problem, we may need to consider more entailments of the proto-thematic roles, besides the ones listed in section 1.2.4.2, or/and a better way of partitioning the entailments.[25] We leave this for

---

[25] As already mentioned, Dowty (1993) acknowledges that the lists in (67) and (68) in section 1.2.4.2 are not necessarily exhaustive and that they could be better partitioned in some other way.

further study.

To summarize, contrary to the claims that a certain hierarchical structure is required for accounts of restrictions on FQ scrambling, the hierarchical structure actually seems to cause some serious problems for correct description of the restrictions on FQ scrambling. Thus, we may conclude that the FQ construction cannot be evidence that Korean or Japanese has a hierarchical clause structure. .

2.2. Arguments for the Flat Structure

As pointed out by Nerbonne (1994), we also can say that the flat analysis provides more general accounts of the linguistic facts than the hierarchical analysis, especially when configurationality of the object language is unclear, in that the mechanisms used in the flat analysis can always be used also in the hierarchical analysis, but not vice versa. For example, we can use the Case Principle in (6), the thematic hierarchy, the obliqueness hierarchy and o-command (or p-command) either on the flat analysis or on the hierarchical analysis, whereas we cannot use the notions such as c-command, move-α or the structural case assignment of Choe (1985) (section 2.1.2) in a flat structure in any meaningful way. In this sense, we may say that other things being equal, the flat analysis is preferable to the hierarchical analysis in Korean.

2.3. Discourse Constraints on Word Order Variations

In sections 2.1 and 2.2, we proposed that Korean clausal structure is flat, and that word order variations at the clause level are not syntactically restricted. On our theory, so-called scrambling phenomena result from the relative freedom of linear precedence constraints among constituents at the clausal level. However, this does not mean that Korean has no canonical constituent order or no restrictions on constituent order variations at all.

Following Uszkoreit (1986, 1987) and Yatabe (1993), we assume that canonical constituent order in Korean is determined by thematic roles, i.e., a phrase with a higher thematic role linearly precedes a phrase with a lower thematic role. On this approach, the existence of canonical order does not require that the subject and the complement(s) be realized in different positions of a hierarchical structure.

Even though Korean allows considerable freedom in constituent order, sentences with different constituent orders are restricted by certain discourse functions. Following Givón (1975), Erguvanli (1984), and Kim (1985a,b) among others, I assume that one of the factors most crucial in constituent order variation in a sentence is the Principle of Information Flow. This principle states that the constituents in a sentence tend to be sequentially ordered in such a way that a constituent expressing given information (i.e., information shared by interlocutors) comes in the initial portion of a sentence, and a constituent expressing new or unpredictable information comes at the end of a sentence. This assumption is supported by the contrast shown in the sentences in (129)-(131), where

in each case, utterances (b) and (c) are possible continuations of utterance (a):

(129) a. Onul   han haksayng-i   na-lul chacaolkkeya.
today   a student-Nom   I-Acc will stop by
'Today, a student will stop by me.'

b. Ku haksayng-hantey   chyak-ul   pilyecwukilohayssta.
the student-to   book-Acc   promised to lend
'(I) promised to lend a book to the student .'

c. #Chyak-ul   ku haksayng-hantey   pilyecwukilohayssta.
book-Acc   the student-to   promised to lend
'(I) promised to lend a book to the student.'

(130) a. Kun kay-ka   nolite nunche-eyse   tolatanitentey.
big dog-Nom playground-near-at   was prowling
'A big dog was prowling near the playground.'

b. Ku kay-ka   elinay-lul   mwulesse.
the dog-Nom a child-Acc   bit
'The dog bit a child.'

c. #Elinay-lul   ku kay-ka   mwulesse.
a child-Acc   the dog-Nom bit
'The dog bit a child.'

(131) a. Mary-ka   nolithe-eyse   telewun cangnankam-ul   hana cwewassta.
M-Nom   playground-at dirty toy   one   pick up and come
'Mary found a toy at the playground and came with it.'

b. Ku cangnankam-ul   emma-ka   mwul-lo   kkakkushi ppalacwuessta.
the toy-Acc   mother-Nom   water-with   cleanly   washed
'(Her) mother washed the toy clean with water.'

c. Emma-ka   mwul-lo   ku cangnankam-ul   kkakkushi ppalacwuessta.
mother-Nom water-with   the toy-Acc   cleanly   washed
'(Her) mother washed the toy clean with water.'

In each of (129) and (130), utterance (b) is more appropriate than utterances (c),

even though we cannot say utterance (c) is ungrammatical. *Ku haksayng* 'the student' in (129) or *ku kay* 'the dog' in (130) is given information already familiar to the interlocutors, while *chayk* 'book' in (129) or *elinay* 'child' in (130) is new information not familiar to the hearer(s). Thus, the Principle of Information Flow predicts that *ku haksayng* 'the student' precedes *chayk* 'book' in (129), and that *ku kay* 'the dog' precedes *elinay* 'child' in (130), as shown in sentences (b). In the case of sentences (c), both canonical word order and the Principle of Information Flow are violated. I.e., both canonical order and the Principle of Information Flow state that *ku haksayng* 'the student' precedes *chayk* 'book' in (129), and that *ku kay* 'the dog' precedes *elinay* 'child' in (130). In this case, as the contrast between the sentences in (b) and (c) shows, speakers tend not to allow scrambling to make the utterances appropriate.

In (131), even though some speakers show some degree of preference for (b) over (c), it is hard to tell which one is more appropriate than the other. Note that (131b) differs from (129b) or (130b) in that it has non-canonical order, i.e., scrambling occurs in (131b). This shows that scrambling is allowed when the Principle of Information Flow is satisfied (cf. (129b) and (130b)). In contrast, (131c) is more appropriate compared with (129c) or (130c), even though (131c) violates the Principle of Information Flow as (129c) and (130c) do. (131c) differs from (129c) or (130c) in that the former keeps canonical order, while the latter do not. This fact is accounted for if we assume that the Principle of Information Flow tends to apply to non-canonical order, i.e., the Principle of Information Flow can be overridden by canonical order.

2.4. Summary and Conclusion

The main claim of this chapter is (i) that Korean has a flat clause structure and (ii) that clause-internal scrambling results from the relative freedom of linear precedence constraints among the non-head constituents at the sentence level. To support our claim, in section 2.1, we have reviewed eight constructions or phenomena that have been claimed to provide crucial evidence for a hierarchical clause structure in Korean and Japanese. None of them turn out to be problematic for a flat analysis. Rather, the flat analysis seems to be preferable to the hierarchical analysis in accounts of some constructions such as word order variation in the emotion verb construction (section 2.1.1.3); anaphor binding (section 2.1.1.6); and weak crossover effects and bound variable binding (section 2.1.1.7). In section 2.2. we also argued for the flat stucture analysis based on the more general applicability of the mechanisms used in the flat analysis, compared with the mechanism used in the hierarchical analysis. Canonical word order and discourse restrictions on scrambling were briefly sketched in section 2.3, based on the Principle of Information Flow.

CHAPTER III

ARGUMENT ATTRACTION AND

AUXILIARY VERB CONSTRUCTIONS

In the previous chapter, we discussed the clausal structure in Korean, proposing that the structure is flat and that freedom of word order (scrambling) is due to the relative freedom of linear precedence constraints among the constituents at the clause level. In this chapter, I discuss the auxiliary verb construction in Korean and its relevant phenomena. The first goal of this chapter is to propose that a mechanism called argument attraction (Hinrichs and Nakazawa (1989, 1994)) is crucial for accounts of the auxiliary verb construction and the relevant phenomena in Korean. Argument attraction is a mechanism which "attracts" the arguments of the governed verb to the argument list of the governing verb. The second goal is to show that scrambling among the arguments of the main verb (e.g., *mekko* 'eat' in (1)) results from the relative freedom of linear precedence constraints among the constituents at the clause level, as does scrambling in a simplex clause.

(1) a. Mary-ka   sakwa-lul mekko   issta.
       M-Nom   apple-Acc eat   be in the process of

   'Mary is eating an apple.'

   b. Sakwa-lul Mary-ka   mekko   issta.
      apple-Acc M-Nom   eat   be in the process of

The organization of this chapter is as follows. In section 3.1, we discuss the properties of auxiliary verb constructions, focusing on the fact that an auxiliary verb (AUX henceforth) and its governed verb make a "strong bond". In section 3.2, we discuss some previous analyses which assume that an AUX takes a VP or a S as its complement and their problems. In section 3.3, we provide linguistic motivations for the argument attraction analysis, showing how it can account for the problems raised in section 3.2. Here we suggest two possible analyses, the complex-predicate analysis following Cho (1988) and the flat-structure analysis. Sections 3.4 is a summary of this chapter.

3.1. Properties of Korean Auxiliary Verbs

The following are examples of Korean auxiliary verbs (AUXs henceforth):

(2)

	Auxiliary verb	Verb form of the governed verb	Example
a.	iss 'be in the process/ state of'	ko	cako issta sleep AUX 'is sleeping'
b.	siph 'want'	ko	cako siphta sleep AUX 'want to sleep'
c.	toy 'be led to'	key	cwukkey toyta die AUX 'be led to die'
d.	an 'not'	ci	cwukci anta 'do not die'
e.	po 'try as a test'	a/e	ilke pota read AUX 'try reading something'
f.	iss 'be in the state of'	a/e	anca issta sit AUX 'be in the state of sitting'
g.	peli 'have the courage to'	a/e	meke pelita eat Aux 'have the courage to eat'
h.	chiwu 'do resolutely'	a/e	phala chiwuta sell AUX 'sell something resolutely'
i.	noh 'do in advance'	a/e	malyenhaye nohta prepare AUX 'prepare something in advance'
j.	cwu 'do as a favor for'	a/e	malyenhaye cwuta prepare AUX 'prepare something as a favor for someone'

k. nay   a/e   kyendye nayta
    'do to the very end/   endure AUX
    thoroughly   'endure to the last'

l. ha   a/e   siphe hata
    'act like'   want AUX
                                                 'act like someone wants something'

m. ci   a/e   sewe cita
    passive   build AUX
                                                 'be built'

An AUX is the head of the verbal expression since (i) the AUX chooses the

morphological verb form of its complement and (ii) verbal suffixes such as sentence type

suffixes (e.g. *-ta* for declarative sentences) and tense suffixes (e.g. *-ess* for past)) are

realized on the AUX. One special property of the AUX construction is that the AUX and

its complement verb make a very "strong bond", differently from other complements

(e.g. subject, objects, etc.) as illustrated in (3):

(3)   a. Mary-ka   sakwa-lul mekko   issta.
          M-Nom   apple-Acc eat   be in the process of

       'Mary is eating an apple.'

       b. i. *Mary-ka   mekko   sakwa-lul issta.
               M-Nom   eat   apple-Acc be in the process of

          ii. *Sakwa-lul   mekko   Mary-ka   issta.
               apple-Acc   eat   M-Nom   be in the process of

       c. afterthoughts

          i. Sakwa-lul   mekko   issta.   Mary-ka
              apple-Acc   eat   be in the process of M-Nom

       ii. Mary-ka   mekko issta.   sakwa-lul
            M-Nom   eat   be in the process of   apple-Acc

       iii. Mekko   issta.   Mary-ka   sakwa-lul
            eat   be in the process of   M-Nom   apple-Acc

       iv. *Mary-ka   sakwa-lul issta.   mekko
            M-Nom   apple-Acc be in the process of   eat

       v. *Mary-ka   issta.   sakwa-lul mekko
            M-Nom   be in the process of   apple-Acc eat

    d. parentheticals

       i. Hayekan   Mary-ka   sakwa-lul mekko   issta.
           anyway   M-Nom   apple-Acc eat   be in the process of

       'Anyway Mary is eating an apple.'

       ii. Mary-ka   hayekan   sakwa-lul mekko   issta.
            M-Nom   anyway   apple-Acc eat   be in the process of

       iii. Mary-ka   sakwa-lul hayekan   mekko   issta.
            M-Nom   apple-Acc anyway   eat   be in the process of

       iv. *Mary-ka   sakwa-lul mekko   hayekan issta.
            M-Nom   apple-Acc eat   anyway   be in the process of

(3b) shows that the governed verb *mekko* 'eat' and the AUX *issta* 'in the process of'

cannot be separated by other arguments. (3c) shows that the governed verb cannot be

separated from the AUX and be an afterthought expression. Finally, (3d) shows that even

a parenthetical expression cannot occur between an AUX and its complement verb.

Most AUXs share properties with subject-control verbs such as *sitoha* 'try' in that

the controller of the AUX is the subject of the main verb. However, AUXs differ from

the ordinary control verbs in that the AUX and its governed verb cannot be separated by an independent word, as shown in (3). A real control verb such as *sitoha* 'try' and its governed verb do not make such a bond as illustrated in (4): the subject *Mary-ka* or an adverbial expression like *kkuncilkikey* 'ceaselessly' can intervene between the governed verb and the control verb (e.g., (4b) and (4c)), and the governed verb can be a part of an afterthought expression and separated from the control verb (e.g., (4d)). (See chapter 4 for detailed discussion on the control verb construction.)

(4) a. Mary-ka   ku mwunce-lul   phwulye-ko   sitohayessta.
       M-nom   the problem-Acc   solve   tried

    'Mary tried to solve the problem.'

    b. Ku mwunce-lul   phwulye-ko   Mary-ka   sitohayessta.
       the problem-Acc   solve   M-nom   tried

    c. Mary-ka   ku mwunce-lul   phwulye-ko   kkuncilkikey   sitohayessta.
       M-nom   the problem-Acc   solve   ceaselessly   tried

    d. Mary-ka   sitohayessta.   ku mwunce-lul   phwulye-ko
       M-nom   tried   the problem-Acc   solve

Now let us consider the analysis of the AUX construction. We have four possible structures for it, as illustrated in (5):

(5) a., b., c., d. [tree diagrams]
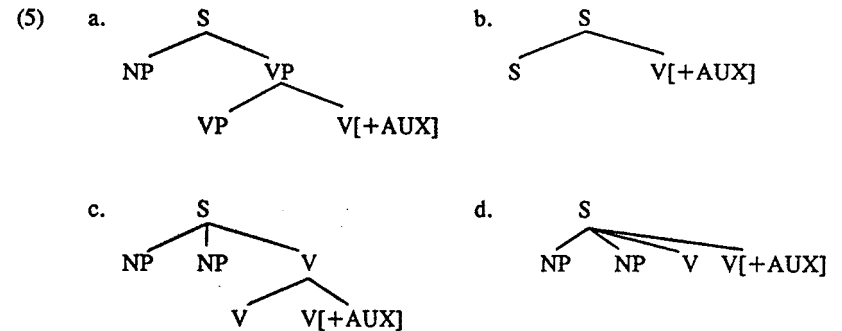
I will call (5a) the VP-complement analysis, (5b) the S-complement analysis, (5c) the complex-predicate analysis, and (5d) the flat-structure analysis. In section 3.2, we discuss the VP- and S-complement analyses and their problems. In section 3.3, we introduce the notion of argument attraction and show how argument attraction works in the complex-predicate analysis and in the flat-structure analysis.

3.2. VP- and S-Complement Analyses and Their Problems

The VP-complement analysis in (5a), advocated by Yoon (1993) and No (1991) among others, states that the complement of an AUX is a VP. One of the difficulties with this analysis is that it is not easy to explain the fact that AUXs differ from ordinary control verbs as discussed in (3) and (4), i.e., AUXs differ from ordinary control verbs in that the AUX and its complement verb do not permit intervening syntactic material (e.g., (3)), while a control verb like *sitoha* 'try' and its governed verb do not make such a bond (e.g, (4)). To avoid this problem, we may assume that a mismatch between syntax and

morphology occurs in the Korean auxiliary verb construction, as proposed in No (1991:

169-171). According to No (1991), an AUX takes a VP as its complement at the level

of syntax, and hence the AUX and the governed verb do not form a unit at the level. At

the level of morphology, however, the clitic AUX must attach to the head of the

complement VP, and hence the AUX and the governed verb form a composite

morphological word. A problem with this proposal is that no empirical syntactic evidence

exists that the AUX takes a VP as its complement. Rather, some syntactic phenomena

that are discussed below cause problems for the VP-complement analysis. Moreover, it

would be theoretically more desirable to get rid of this kind of mismatch between two

components in a grammar whenever possible, especially when the motivation for the

mismatch is not obvious.

The first empirical problem for the analysis in (5a) is a fact about passivization.
In Korean, generally two kinds of passivization are assumed. One is passivization through

suffixes (-i, -hi -li, and -ki), and the other is passivization through the AUXs ci

(henceforth ci-passivization). Passivization that is relevant to the current discussion is ci-

passivization because AUXs are passivized only through ci-passivization. An example of

ci-passivization is as follows:

(6)   a. Cengpwu-ka   ku kenmwul-ul   seywessta.
           government-Nom the building-Acc constructed
           'The government constructed the building.'

        b. Ku kenmwul-i   cengpwu-eyuyhay   seywe   ci-essta.
           the building-Nom government-by   construct passive-past
           'The building was constructed by the government.'

Even though not all AUXs can be governed by the AUX ci, some AUXs can be

governed and be passivized, as shown in (7)-(9):[1]

(7)   a. Ku nongpwu-ka   malssengmanhun so-lul   phala chiw-essta.
           the farmer-Nom troublesome   cow-Acc sell   do resolutely-past
           'The farmer resolutely sold the troublesome cow.'

        b. Malssengmanhun so-ka   (ku nongpwu-eyuyhay)
           troublesome   cow-Nom   the farmer-by
           phala chiwe   ci-essta.
           sell   do resolutely passive-past
           'The troublesome cow was resolutely sold (by the farmer).'

---

[1]The distinction between passivizable and non-passivizable AUXs seems to result
from semantic constraints on ci-passivization. According to Li and Thompson (1975), the
passive construction in topic-prominent languages such as Japanese and Korean carries
a special meaning (e.g., the "adversity" passive in Japanese). The ci-passive in Korean
also seems to have a semantic constraint, i.e., the verb or verbal cluster to which the
passive ci attaches must not be a stative verb which denotes a certain state, in terms of
Dowty (1979). For example, the following sentences have sharp contrasts compared with
the sentences in (7)-(9):

(i)   a. * Ku namwu-ka   Mary-eyuyhayse caluko isse
            the tree-Nom   M-by   cut   be in the process of
            ci-essta.
            passive-past
            'The tree was in the process of being cut.'
      b. * Ku namwu-ka   Mary-eyuyhayse caluko siphe ci-essta.
            the tree-Nom   M-by   cut   want passive-past
            'The tree was wanted to be cut by Mary.'
      c. * Ku namwu-ka   Mary-eyuyhayse calukey   toye   ci-essta.
            the tree-Nom   M-by   cut   be led to passive-past
            'The tree was led to be cut by Mary.'

Here the verbal clusters to which the passive ci attaches represent states, while the ones
in (7)-(9) represent activities.

(8) a. Kwukhoyuywentul-i ku pepan-ul malyenhay nohu-nikka,
 Congressmen-Nom the bill-Acc plan do in advance-when
 taythonglyeng-i pantayhayssta.
 president-Nom raised an objection
 'When congressmen planned the bill, the president raised an objection to it.'

 b. Ku pepan-i (kwukhoyuywentul-eyuyhay) malyenhay
 the bill-Nom Congressmen-by plan
 noha ci-nikka, taythonglyeng-i pantayhayssta.
 do in advance passive-when president-Nom raised an objection
 'When the bill was planned by congressmen, the president raised an objection to it.'

(9) a. Motun salam-i ku himtun kopi-lul
 all people-Nom the tough crisis-Acc
 cal kyentie nayessta.
 well endure do thoroughly
 'All people well endured the tough crisis thoroughly.'

 b. Ku himtun kopi-ka (motun salam-eyuyhay)
 the tough crisis-ka all people-by
 cal kyentie naye ci-essta.
 well endure do thoroughly passive-past
 'The tough crisis was well endured thoroughly by (all people).'

If we assume the analysis in (5a) to be the structure of the AUX construction, the structures of (7a,b) would be as in (10a,b), respectively:

(10) a. [s Ku nongpwu-ka [vp [vp malsssengmanhun so-lul
 the farmer-Nom troublesome cow-Acc
 phala] chiw-essta]]
 sell do resolutely-past
 'The farmer resolutely sold the troublesome cow.'

 b. [s Malssengmanhun so-ka [vp [vp [vp (ku nongpwu-eyuyhay) phala]
 troublesome cow-Nom the farmer-by sell
 chiwe] ci-essta].
 resolutely passive-past
 'The troublesome cow was resolutely sold (by the farmer).'

Under standard assumptions in Phrase Structure Grammar, an object can be passivized only when it is an argument of a verb on which a passive morpheme is realized. In (10b), the object NP *malssengmanhun so-lul* 'the troublesome cow' is an argument of the main verb *phala* 'sell', but not of the AUX *chiwe* 'do resolutely' or the passive AUX *ciessta*. Then it is not clear how we can account for the fact that the AUX *ci* makes the typical passive valence change, i.e., a primary object changes to the subject, and the subject changes to a PP complement.

Another problem for the VP-complement analysis arises from the fact that emotion AUXs such as *siph* 'want' and *silh* 'dislike' can trigger a case alternation of the NP object which is directly governed by the main verb, as shown in (11) and (12):

(11) a. Nay-ka sakwa-lul mekessta.
 I-Nom apple-Acc ate

 'I ate an apple.'

 b. *Nay-ka sakwa-ka mekessta.
 I-Nom apple-Nom ate

(12) a. Nay-ka sakwa-lul mekko siphta.
 I-Nom apple-Acc eat want

 'I want to eat an apple.'

b. Nay-ka sakwa-ka mekko siphta.
  I-Nom   apple-Nom eat   want

(11) shows that the verb *mek* 'eat' assigns only accusative case to the NP object. However, when the AUX *siph* 'want' governs the verb *mek* 'eat', nominative case can also be assigned to the object, as shown in (12b). If we assume the VP-complement analysis, the structure of the sentences in (12a) is as in (13):

(13) a. [_S Nay-ka [_{VP} [_{VP} sakwa-lul mekko] siphta]]
     I-Nom   apple-Acc eat   want

    'I want to eat an apple.'

  b. [_S Nay-ka [_{VP} [_{VP} sakwa-ka mekko] siphta]]
     I-Nom   apple-Nom eat   want

Under a standard assumption, case assignment is a local phenomenon in that the case assignee is required to be head governed by the assignor. Following this assumption, Pollard and Sag (1987:143-144) suggest that the case assignment is one of the phenomena which observe the Locality Principle:[2] there is no verb in any language that assigns case to some NP properly contained within one of its complements. A problem for the

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[2]Pollard and Sag (1987) define the Locality Principle as follows: the SUBCAT elements of *lexical sign* (*word* in Pollard and Sag (1994)) specifies values for SYNTAX and SEMANTICS (SYNSEM in Pollard and Sag (1994)) but crucially not the attribute DAUGHTERS. However, Pollard and Sag (1994) assume that elements of SUBJ or COMPS lists are not of sort *sign* but sort *synsem* which does not includes the attribute DAUGHTERS. In this framework, the Locality Principle is incorporated into the definition of the features, and thus the Locality Principle needs not be separately stated.

structure in (13b) is that it violates this Locality Principle. I.e., to account for the fact that the AUX can alternate case of the object NP from accusative to nominative, we need to assume that the AUX can assign nominative case to the NP that is properly contained within the VP complement. We may simply say that the Korean emotion AUX is an exception to the Locality Principle or that the Principle is not universal. However, it would clearly be better if we could provide an analysis which accounted for the given fact without violating a general principle.

Another case alternation problem similar to the above arises from the "deemotion AUX" *ha* 'act like'.[3] The AUX *ha* always governs an emotion verb and "deemotionalizes" it. I.e., when the AUX *ha* attaches to an emotion verb, the whole predicate does not have typical properties of an emotion verb any longer. One of the effects of deemotionalization is that the combination does not allow nominative case to be assigned to the primary object of the main verb, as shown in (14):

(14) a. Nay-ka sakwa-lul/-ka mekko siphta.
     I-Nom   apple-Acc/-Nom eat want
    'I want to eat an apple.'

  b. Mary-ka sakwa-lul/*-ka mekko siphe hanta.
     M-Nom apple-Acc/-Nom eat want act like
    'Mary acts like she wants to eat an apple.'

In the VP-complement analysis, the structure of (14b) is as in (15):

---

[3]Following No (1991), we call the AUX *ha* a "deemotion" AUX .

(15)   [$_S$ Mary-ka [$_{VP}$ [$_{VP}$ [$_{VP}$ sakwa-lul/*-ka   mekko]   siphe] hanta]]
       M-Nom   apple-Acc/-Nom eat   want   act like
       'Mary acts like she wants to eat an apple.'

Again, in this analysis, it is impossible, without violating the Locality Principle, to

account for the fact that the AUX *ha* always takes as its complement a VP which

contains an NP object with accusative case, if the NP exists.

The S-complement analysis in (5b) has the same problems that occur in the VP-

complement analysis. That is, it is hard to account for (i) the strong bond between the

AUX and the governed verb, (ii) the fact that an object NP of the main verb can be

passivized while the passive morpheme is not realized on the verb, and (iii) the fact that

an emotion or deemotion AUX can alternate case of the object NP of the main verb. In

addition to these problems, the S-complement analysis has one more empirical problem.

In this analysis, the AUX has no direct access to the subject, so it would be hard to

explain subject-verb honorific agreement, as shown in (16):

(16)   a. Halapeci-kkeyse   ku chayk-ul   ilke   po-si-essta.
           grandfather-Hon.Nom   the book-Acc read   try-Hon-past

           'Grandfather tried reading the book.'

       b. Halapeci-kkeyse   ku chayk-ul   ilk-usie   poassta.
           grandfather-Hon.Nom   the book-Acc read-Hon   tried

       c. Halapeci-kkeyse   ku chayk-ul   ilk-usie   po-si-essta.
           grandfather-Hon.Nom   the book-Acc read-Hon   try-Hon-past

       d. #Halapeci-kkeyse   ku chayk-ul   ilke   poassta.
            grandfather-Hon.Nom   the book-Acc read   tried

In the S-complement analysis, the structure of (16a) is as in (17):

(17)   [$_S$ [$_S$ Halapeci-kkeyse   ku chayk-ul   ilke]   po-si-essta]
              grandfather-Hon.Nom   the book-Acc read   try-Hon-past
              'Grandfather tried reading the book.'

The problem is that (17) also violates the Locality Principle: there is no verb in any

language that agrees with an NP properly contained within one of its complements. In

(17), the AUX agrees with the subject NP, which is properly contained within the S

complement.

In the following section, we discuss some alternative analyses that account for all

the given data in this section without making them exceptions to the general observations.

These alternatives are the analyses in (5c,d). In both analyses, the complement of the

AUX is a simple verb rather than a VP or S. In these analyses, the notion of argument

attraction plays a crucial role, and thus they are called argument attraction approaches.

3.3. Argument Attraction Approaches

Hinrichs and Nakazawa (1989, 1994) introduce the mechanism of argument attraction into

the HPSG framework to account for linear order of the verbal complexes in German. And

the mechanism is adopted by other HPSG researchers such as Kiss (1994), Gerdemann

(1994), and Ryu (1993). Argument attraction is so called because the effect of the

mechanism is to "attract" the arguments of the governed verb to the argument list of the

governing verb. In HPSG, argument attraction is represented by structure sharing between the SUBCAT(EGORIZATION) values of the governed verb and the governing verb.[4] A simplified example from Hinrichs and Nakazawa (1994) is as follows: (Here $X_0 | <X_1,...,X_n>$ is $<X_0,X_1,...,X_n>$. That is, $X_0 | <X_1,...,X_n>$ means that X_0 is the first element of a list and $<X_1,...,X_n>$ is the rest of the list.)[5]

(18)
```
                    V[SUBCAT [2]]
                   /            \
  [1]V[SUBCAT [2]<NP, NP>]     H[SUBCAT [1]|[2]]
          |                           |
        finden                       wird
        'find'                       'will'
```
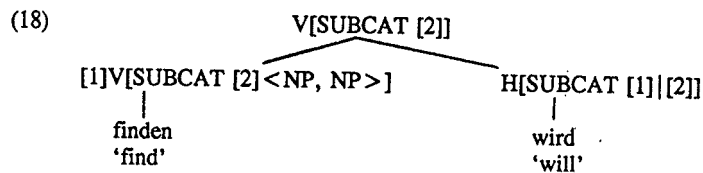
In (18), the SUBCAT value (the list of the subcategorized-for elements) of the transitive verb *finden* is $<NP, NP>$ and is tagged by [2]. The verb itself is tagged by [1]. The SUBCAT value of the AUX *wird* is [1]|[2] (i.e., [1]V|[2]$<NP, NP>$) which is $<[1]V, NP, NP>$). Hence the effect of the function | is to attract or raise the subcategorized-for elements ($<NP, NP>$) of the governed verb *finden* into the SUBCAT list of governing AUX *wird*. Then the SUBCAT value of the mother node is $<NP, NP>$ since [1]V is discharged by the Valence Principle in chapter 1.

In the following sections, we will try to show how the problematic cases

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[4]Hinrichs and Nakazawa (1989, 1994) use a version of HPSG where the valence list is not divided into the subject and complement lists. In this version, arguments of a lexical entry are elements of the SUBCAT list.

[5]This is essentially the same as the CONS function in LISP which takes an element and a list to give a list: element + list → list.

---

illustrated in previous section are accounted for by the argument attraction mechanism. Two different analyses seem to be possible on this approach. We first discuss the complex-predicate analysis in (5c) which is considered to be the preferred analysis, and then the flat-structure analysis in (5d).

3.3.1. Complex-Predicate Analysis

Roughly, this approach says that the main verb and AUX(s) form a constituent while the subject and complements of the main verb are sisters to the verbal cluster. Considering the fact that many AUXs can occur in a sentence, we need at least the following LP constraint in (19) and the schematic ID rules in (20) on this approach.

(19)   X ≺ HEAD

(20)   a. S → Subj, Comp*, H

       b. V → V, H

LP constraint (19) simply says that a head can be preceded by any category.[6] (20a) is an abbreviation of the Head-Subject-Complement Schema which is basically the same as the rule suggested in Hale (1982) which says that a sentence consists of an arbitrary number of non-head daughters (a subject and complements) and a lexical head. (20b) says

---

[6]See section 4.4 in chapter 4 for more formal LP constraints that embody the head-finality in Korean.

that V consists of a complement daughter V and a lexical head. Here, we treat the verbal clusters (the combination of a main verb and AUX(s)) as a kind of morpho-syntactic compound word. This analysis is consistent with the compound analysis of the AUXs in Cho (1988) and Sells (1991) even though they do not provide any specific mechanism for the compounding, especially with regard to the subcategorization frame of the compound verb. For example, the rough analysis of (21a) looks like (21b) on this approach.

(21) a. Mary-ka   ku chayk-lul   ilke   poko   issta.
          Mary-Nom   the book-Acc   read   try   be in the process of

      'Mary is trying reading the book.'

b.
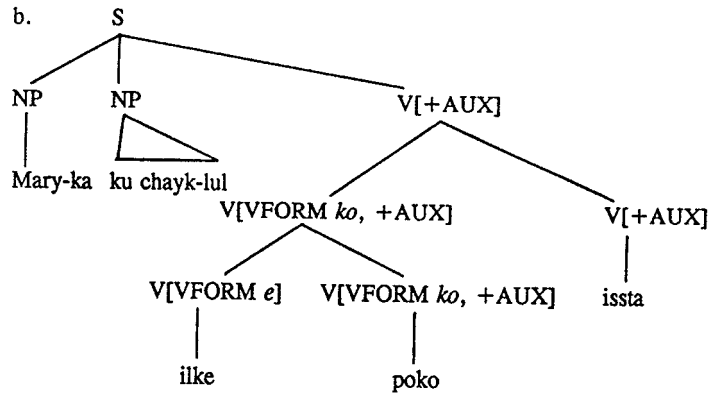
On this analysis, the AUX and its governed verb form a verbal complex which excludes the NP arguments selected by the verb *ilke* 'read'. To this end, Chung (1993a) proposes (i) that AUXs have another valence feature, namely "GOV(ERNEE)" which takes as its value a list of the governed verb, (ii) that rule (20b) should be understood as

a lexical compounding schema that compounds a lexical AUX with its lexical governee, and (iii) that following Krieger and Nerbonne (1991), sort *word* has subsorts *simple-word* and *compound*, where *compound* has a new feature LEXICAL-DAUGHTERS (LEX-DTRS) whose value is a new sort *compound-structure* with features HEADWORD and GOVERNEE. The proposed sort hierarchy is represented in (22):

(22)
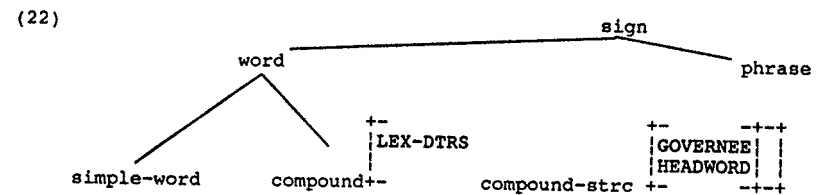
On this analysis, the lexical compounding rule looks like (23a), which simply says that a head word (i.e., an AUX) selects a simple or compound word (i.e., a main verb or a main verb plus AUX(s)). Rule (20a) also needs to be changed into (23b):

(23) a.

b. S → Subj, Comp*, H[GOV < >]

Before we proceed to see how these rules work in detail, I would like to discuss a potential problem for the sort hierarchy assumed in (22) and the word formation rule in (23a). (22) indicates that the sort *compound* is a subsort of *word*, so that the verbal

complex forms a syntactic word. However, No (1991) points out two facts suggesting that a main verb and an AUX must be considered to be combined by syntactic principles and hence that the combination cannot be considered as a syntactic word whose internal structure is invisible from the level of syntax. The first fact concerns bound morphemes called delimiters: e.g., *-man* 'only', *-to* 'also', *-cocha* 'even', etc., which can intervene between an inflected main verb and an AUX (e.g., *mekko-man issta* (eat-only be-in-the-process-of) 'be only eating'). No points out that delimiters need to be viewed as a syntactic category since they occur not only after a verb but also after a noun or a postposition, i.e., their distribution is not confined to within a verbal morphology. Then, it is doubtful that syntactic material such as a delimiter could intervene between a verb and the AUX if the verbal complex is a real syntactic word.

No also points out that the combination of an AUX and its governed verb is wholly productive and semantically compositional. This productivity and compositionality are typical properties of syntactic rules, but not of word-formation rules.

To accommodate the syntactic characteristics of the verbal complex, we may need to revise the sort hierarchy shown in (22) into (24):

(24)

```
                                    sign
              nonphrase                        phrase
          word          complex-word[LEX-DTRS...]
   simple-word      compound
```
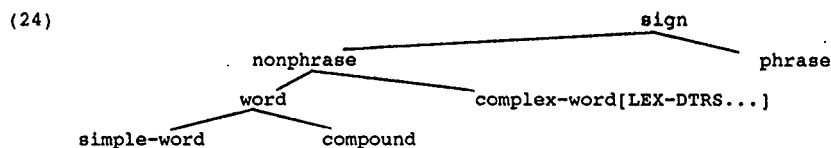
(24) states that the sort *sign* has two subsorts *phrase* and *nonphrase*. The sort *nonphrase*,

in turn, has two subsorts *word* and *complex-word*. The complex-word represents various kinds of so-called complex predicates, e.g., the verbal noun construction discussed in Ryu (1993), and the delimiter construction that will be discussed shortly as well as the AUX construction in question. It takes the LEX-DTRS (lexical daughters) attribute, and the composition of the LEX-DTRS are governed by syntactic principles and rules, as the composition of the subject and complement daughters in a phrase is. The sort *word* corresponds to the syntactic word whose internal structure is not visible from the level of syntax. It includes all kinds of inflected or derived simple words which belong to the subsort *simple-word*, and morphological compound words (e.g., *blackboard*) which belong to the subsort *compound*. If we assume the sort hierarchy in (24), the sort of the verbal complex is *complex-word*, and the rule in (23a) needs to be changed into (25):

(25)

```
               complex-word [GOV < >]
       GOVERNEE                HEADWORD
   nonphrase[SYNSEM [1]]      simple-word [GOV < [1] > ]
```
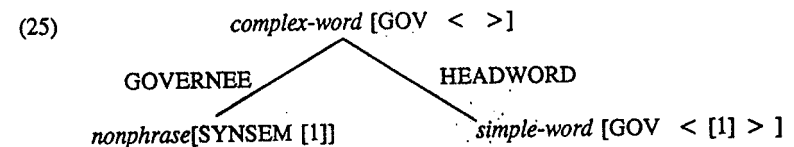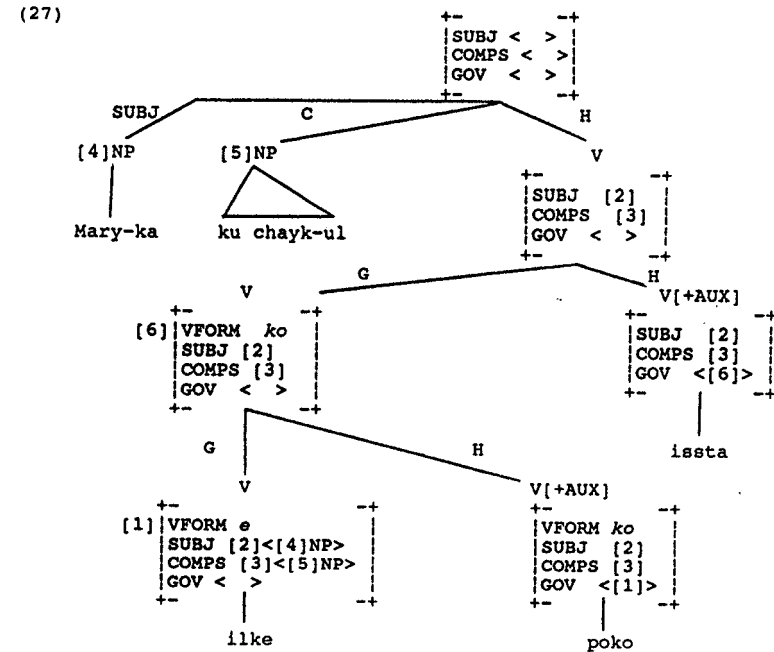
Also note that (25) must now be regarded as a syntactic schema, not as a word formation rule. That is, the sort hierarchy in (24) states that, besides *phrase*, there exists another type of constituent structure, namely *complex-word*, which is formed by the different type of syntactic rule in (25).

For example, on this analysis, the valence features for the AUX *iss* 'be in the process of' are as in (26), which embodies the assumption that the COMPS list of the

verb selected by an AUX can be inherited to the COMPS list of the AUX:

(26) *iss*

```
+-                                        -+
|  SUBJ    [1]                             |
|  COMPS   [2]                             |
|  GOV     V[VFORM ko, SUBJ [1], COMPS [2]] |
+-                                        -+
```
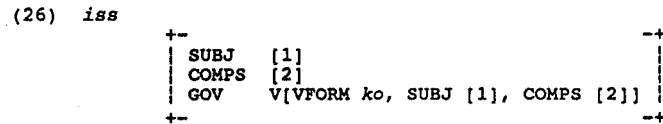
(26) states (i) that the AUX *iss* selects a verb which has the VFORM (verb form) *-ko*;[7]
(ii) that the COMPS value of the AUX is structure-shared with that of its governee verb,
which is represented by [2]; and that the SUBJ value of the AUX is structure-shared with
that of the governee verb, which is represented by [1]. The valence features of most
AUXs in Korean are the same as (26).[8] On this approach, the sentence in (21a) is
analyzed as follows:

---

[7] See section 4.4.3.1 in chapter 4 for more precise verbal morphology where the
[VFORM *-ko*] is analyzed as a complementizer.

[8] An exception is the passive AUX *ci*, which will be discussed shortly.

(27)

The first advantages of this complex-predicate approach is that the strong constituency of
the verbal clusters can be directly captured in terms of a structural unit, and hence there
is no need to assume the syntax and morphology mismatch assumed in No (1991).

The second advantage is that there is no need to assume a mechanism such as
move-α or the VP-flattening metarule in Pullum (1982) to account for the scrambling
phenomena illustrated in (1). On this analysis, the arguments of the verbal complex are
all sisters, and scrambling results from the lack of LP constraints among the arguments.

The third advantage is that the problems raised in the VP-complement analysis are
not problems any longer. In the rest of this section, we will show how the problems of

passivization (e.g., (7)-(9)) and case alternation (e.g., (12) and (14)) are solved in the complex-predicate analysis.

For *ci*-passivization, shown in (7)-(9), we assume the following lexical entry for the AUX *ci*. Here $<X_0,...,X_{n-1}> \oplus X_n$ is $<X_0,...,X_{n-1},X_n>$.

(28)
```
+-                                                  -+
| SUBJ <[2]NP[str]>                                 |
| COMPS [3]⊕PP[uyhay]::[1]                          |
| GOV <V[SUBJ <NP[str]::[1]>, COMPS [2]NP[str]|[3]> |
+-                                                  -+
```

(28) states the following: (i) the AUX *ci* takes a verb as its governee, (ii) the subject of the governee (NP[*str*]::[1]) is coindexed with the PP[*uyhay*] which is a value of the COMPS list of the AUX, (iii) the first element of the COMPS list which is the primary object of the governee ([2]NP[*str*]) is structure shared with the subject of the AUX, and (iv) the rest of the COMPS list of the governee ([3]) is attracted to the COMPS list of the AUX.

On this approach, the analysis of the sentence in (7b), which is repeated below, is as in (29):

(7) b. Malssengmanhun so-ka   (ku nongpwu-eyuyhayse)
        troublesome   cow-Nom the farmer-by
        phala chiwe   ciessta.
        sell do resolutely   passive
        'The troublesome cow was resolutely sold (by the farmer).'

(29)
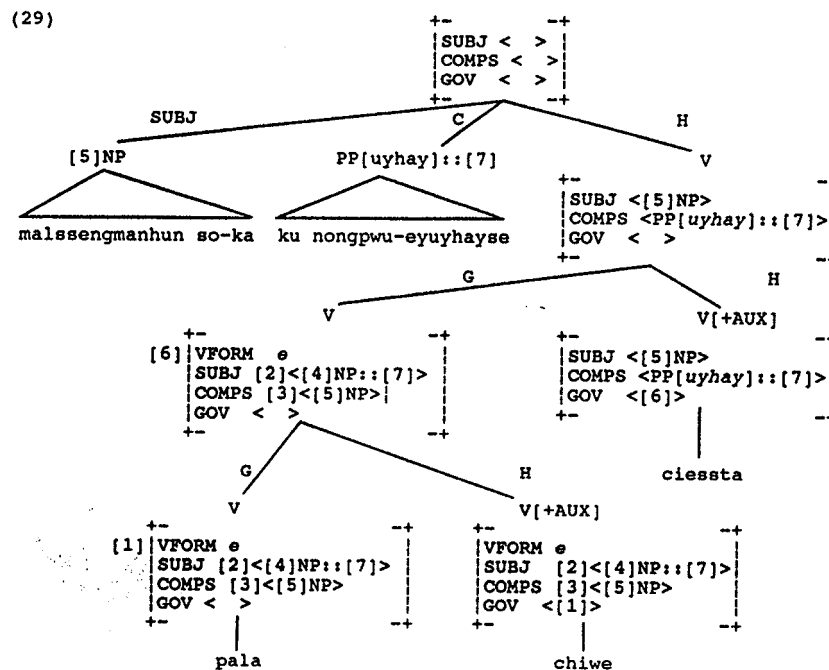
In (29), the primary object of the verb *phala* 'sell', *malssengmanhun so* 'troublesome cow' ([5]NP), is attracted to the COMPS list of the AUX *chiwu* 'do resolutely', percolates up to the mother node via the Valence Principle, and attracted to the SUBJ list of the AUX *ciessta* (passive). The subject of the main verb *phala*, *ku nongpwu* 'the farmer' ([4]NP::[7]) is attracted to the SUBJ list of the AUX *chiwu*, percolates up to the mother node, and coindexed with the PP[*uyhay*] in the COMPS list of the AUX *ciessta*. Here the COMPS value of the AUX *ciessta* is just $<$PP[*uyhay*]::[7]$>$ since the rest COMPS list of the GOV except the first element (the primary object) is an empty list.

For the case alternation triggered by emotion AUXs, we assume two kinds of lexical entries for an emotion AUX as in (30):[9]

```
(30)    a.        +-                                    -+
                  | SUBJ [1]                              |
                  | COMPS [2]                             |
                  | GOV <V[SUBJ [1], COMPS [2]>|
        emotion   +-                                    -+

        b.        +-                                              -+
                  | SUBJ [1]                                        |
                  | COMPS NP[nom]::[3]|[4]                           |
                  | GOV <V[SUBJ [1], COMPS NP[str]::[3]|[4]>|
        emotion   +-                                              -+
```

(30a) indicates that the COMPS value of the governed verb is directly attracted to the COMPS value of the emotion AUX. This lexical entry is responsible for the sentence like (12a) repeated below:

(12)   a. Nay-ka   sakwa-lul mekko   siphta.
           I-Nom   apple-Acc eat   want
           'I want to eat an apple.'

In (30a), the COMPS list of the governee is structure-shared as a whole with that of the AUX, and hence structural case assigned to the object of the governee is inherited to the COMPS list of the AUX without any change. Then by the Case Principle discussed in chapter 1, accusative case is assigned to the object NP.

---

[9]A similar approach is taken in Yoo (1993: 196). Yoo adopts the GOV feature in Chung (1993a) for lexical entries of emotion AUXs. The lexical entries proposed by her has a minor technical problem as they are, since they lead to saying that an emotion verb takes only a transitive verb as its governee.

In contrast, the lexical entry in (30b) indicates (i) that the first NP of the COMPS list of the governee has structural case (i.e., NP[str]::[3]) and is coindexed with the first NP of the COMPS list of the AUX, (ii) that nominative case is assigned to the coindexed NP in the COMPS list of the AUX (i.e., NP[nom]::[3]), and (iii) that the rest of the COMPS list of the governee, represented by [4], is attracted to the COMPS list of the AUX. This lexical entry is responsible for the sentence like (12b), repeated below, which has an object with nominative case.

(12)   b. Nay-ka   sakwa-ka   mekko   siphta.
           I-Nom   apple-Nom   eat   want
           'I want to eat an apple.

An example of another case alternation phenomena is in (14), which is due to the deemotion AUX *ha* 'act like'. The example is repeated below:

(14)   a. Nay-ka   sakwa-lul/-ka   mekko siphta.
           I-Nom   apple-Acc/-Nom   eat   want
           'I want to eat an apple.'

       b. Mary-ka   sakwa-lul/*-ka   mekko siphe hanta.
           M-Nom   apple-Acc/-Nom   eat   want   act like
           'Mary acts like she wants to eat an apple.'

Here due to the deemotion AUX *ha*, the case of the object must be accusative even though it is governed by an emotion AUX *siphe* 'want'. To account for this phenomena, we assume the following lexical entry for the AUX *ha*.

(31)
```
+-                                            -+
| SUBJ [1]                                     |
| COMPS (NP[acc]::[2])|[3]                      |
| GOV <V[SUBJ [1], COMPS (NP::[2])|[3]>        |
+-                                            -+
```

(31) indicates (i) that if the AUX *ha* takes as its governee a verb whose first COMPS value is an NP (the primary object represented by NP::[2]), the NP is coindexed with the first NP in the COMPS list, and (ii) that accusative case is assigned to the coindexed NP in the COMPS list of the AUX (i.e., NP[*acc*]::[2]), and (iii) that if such an NP (primary object) does not exist in the COMPS list of the governee, then the whole COMPS list, represented by [3], is attracted to the COMPS list of the AUX. In the complex-predicate analysis, the COMPS value of the governed verb is directly accessible from the governing verb, and hence the governing verb can select a certain category as a governee and specify the case alternation of the governee's complement. Due to this selectabilty, we can exclude the ill-formed sentence in (14b) which has an NP complement with nominative case, without violating the Locality Principle.

As shown above, the emotion AUX can change the case of the primary object of the governed verb from accusative to nominative. However, when the emotion AUX such as *siph* 'want' governs the deemotion AUX *ha* 'act like', the case of the primary object cannot be altered, as shown in (32):

(32) a. Nay-ka   sakwa-lul coha   hako   siphta.
        I-Nom   apple-Acc like   act like   want
        'I want to act like I like apples.'

b. *Nay-ka   sakwa-ka coha   hako   siphta.
     I-Nom   apple-Acc like   act like   want
     'I want to act like I like apples.'

From this fact, we may assume that the case alternation through emotion AUXs is possible only when the case of the primary object of the governed verb is not lexically specified, i.e., only when its case is structurally assigned. Our approach correctly predicts this fact. The structure for (32a) is as follows:[10]

(33)

---
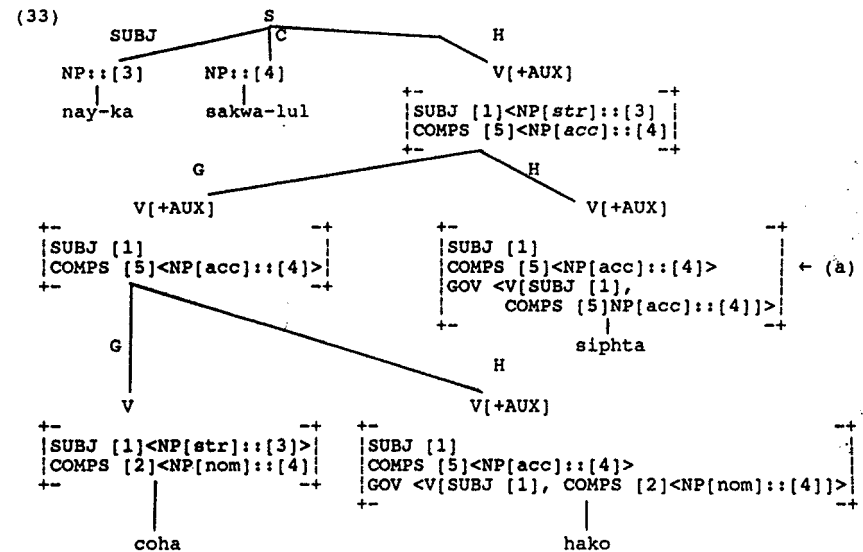
[10]As already mentioned in chapters 1 and 2, non-auxiliary emotion verbs such as *coh* 'like', *silh* 'dislike', *mip* 'hate', etc. lexically assign nominative case to the object of the verb. This is represented in the lexical entry of the verb, i.e., the NP in the COMPS list is specified with nominative case.

The lexical entry indicated by node (a) above is an instance of (30a). The lexical entry in (30b) is not applicable to this node because (30b) is the lexical entry for the emotion AUX which takes as its governee a verb whose complement NP has structural case. As shown in node (a), this lexical entry has to take as its governee a verb whose complement NP is accusative, which is lexically assigned by the deemotion AUX *ha* 'act like' (cf. (31)). Therefore, the ill-formed sentence in (32b) is never licensed on our approach.

As mentioned earlier in this section, delimiters (DLs henceforth) are the only expressions that can occur between a verb and its governing AUX. We would like to finish this section with a discussion of how DLs can be handled in the complex-predicate analysis. DLs are bound morphemes which attach to a verb, a noun, or a postposition. When they modify a verb, they attach only to verbs with the *-a/e*, *-key*, *-ci*, or *-(la)ko* form. Thus, (34a,b) below are well-formed because the DL *-man* 'only' attaches to verbs with the *-ko* or *-e* form, while (34c) is ill-formed because the DL attaches to a verb of a finite form or a base form.

(34) a. Nay-ka   ku chayk-lul   ilke-man   poko   siph-essta.
          I-Nom   the book-Acc   read-only   try   want-past
          'I wanted to try only reading the book.'

      b. Nay-ka   ku chayk-lul   ilke   poko-man   siph-essta.
          I-Nom   the book-Acc   read   try-only   want-past
          'I wanted to only try reading the book.'

      c. *Nay-ka   ku chayk-lul   ilke   poko
          I-Nom   the book-Acc   read   try
          siph-essta-man/siph-man-essta.
          want-past-only/want-only-past
          'I only wanted to try reading the book.'

To represent this selectional property of DLs, we may use the feature MOD (modified) in HPSG. As mentioned in chapter 1, the MOD is a feature in an adjunct which takes as its value a category that is modified by the adjunct. The rule for the DL construction is proposed in (35):
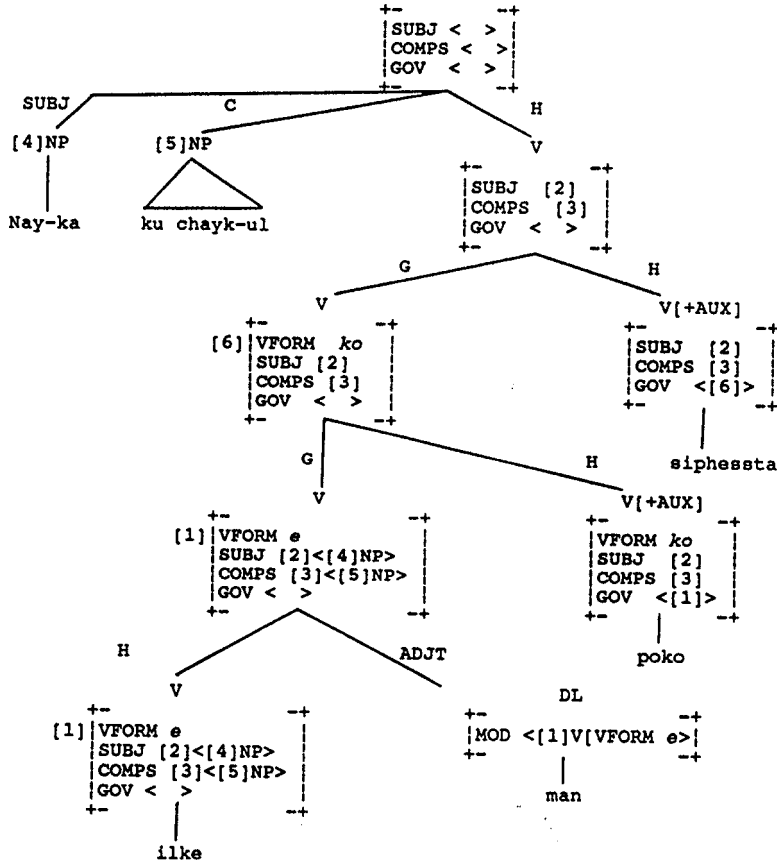
(35)   complex-word[   ]
          HEAD-WORD   ADJUNCT
      simple-word[SYNSEM [1]]   delimiter[MOD <[1]V[VFORM α]>][11]

          (Here α = e/a, key, ci, (la)ko)

On this analysis, the structure of (34a) is as follows:

---

[11]Considering that DLs also can modify a noun or postposition, the rule in (35) needs to be more complicated. The MOD value of the sort *delimiter* needs to be revised to <[1]V[VFORM α] $\lor$ [1]N $\lor$ [1]P>. We use the simplified version in (35) since modification of a noun or postposition has no effect on the current discussion. Also section 4.4.3.1 for more precise verbal morphology where all VFORMs in (35) are analyzed as complementizer forms.

(36)

```
                                    +-           -+
                                    | SUBJ  < >   |
                                    | COMPS < >   |
                                    | GOV   < >   |
                                    +-           -+
        SUBJ           C                                        H
       [4]NP        [5]NP                                       V
                                                  +-             -+
                                                  | SUBJ   [2]    |
      Nay-ka      ku chayk-ul                     | COMPS  [3]    |
                                                  | GOV   < >     |
                                                  +-             -+
                                    G                              H
                               V                             V[+AUX]
                      +-               -+                +-             -+
                      | [6] | VFORM ko  |               | SUBJ   [2]    |
                      |     | SUBJ [2]  |               | COMPS  [3]    |
                      |     | COMPS [3] |               | GOV   <[6]>   |
                      |     | GOV  < >  |               +-             -+
                      +-               -+                        |
                               G                   H          siphessta
                          V                      V[+AUX]
                 +-                  -+      +-                -+
                 | [1] | VFORM e      |     | VFORM ko          |
                 |     | SUBJ [2]<[4]NP>|   | SUBJ  [2]         |
                 |     | COMPS [3]<[5]NP>|  | COMPS [3]         |
                 |     | GOV < >       |    | GOV  <[1]>        |
                 +-                  -+     +-                -+
              H                    ADJT              |
              V                    DL              poko
       +-                -+   +-                 -+
       | [1] | VFORM e     |  | MOD <[1]V[VFORM e>|
       |     | SUBJ [2]<[4]NP>| +-                -+
       |     | COMPS [3]<[5]NP>|        |
       |     | GOV < >      |          man
       +-                -+
               |
             ilke
```

Note that here the headess of the modified verb *ilke* 'read' is maintained due to the fact that the delimiter *-man* 'only' is an adjunct, and thus information of the verb (e.g., its category, its valence features, and its VFORM feature) percolates up to the mother node without any change.

Before we discuss an alternative analysis represented by the flat analysis in (5d),

we will compare our argument attraction analysis with the verb projection raising (VPR) analysis proposed by Haegeman and Riemsdijk (1986). They propose the reanalysis rule in (37) for the account of verbal complexes in Germanic languages:

(37)   Reanalysis

   If the representation of a sentence contains the line $X \, V^i_q \, V_r \, Y$, where $0 \le i \le 2$ and V_r is a VR ([verb raising]) verb, then add the line $X \, V_x \, Y$ to that representation.

The rule in (37) is intended for stating that when there is a sequence of verbs, V_q and V_r, and when V_r is a VR verb, V_q and V_r are reanalyzed as V_x, as in (38):

(38)

```
            V_x
           /   \
         V_q    V_r
```
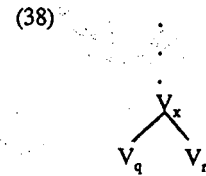
In (37), the superscript i in V^i_q represents the verbal category V_q can be V^0, V' or VP, depending on languages. If we adopt the reanalysis in (37) for Korean, we may assume that $i = 0$, so that the reanalyzed verbal complex is a combination of nonphrasal categories which do not dominate arguments such as a subject or complements.

In the structure like (38), where V_r is the head, the internal θ-role of V_q is assumed to percolate up to V_x, while both the internal and external θ-roles of V_r are

assumed to percolate up to V_x. Then the percolated internal θ-role of V_q is assumed to be "associated with" that of V_r. Here, the notion of "associated with" is not clearly defined, but we can regard it as having the same effect as argument attraction or structure-sharing. On our account, (i) the COMPS list of V_q is attracted to the COMPS list of V_r by the lexical structure of V_r, and (ii) the SUBJ list and COMPS list with the attracted elements percolate up by the Valence Principle. We may say that argument attraction and the Valence Principle correspond to the internal θ-role association and θ-role percolation, respectively.

Despite the apparent similarity between the VPR and our analyses, ours has at least two advantages over the VPR analysis. One advantage is its formal preciseness. The formulation of the reanalysis rule in (37) is so vague that we cannot tell how the reanalyzed structure is licensed, i.e., how can "adding the line X V_x Y" license the structure in (38) without any separate theory about "adding the line"? For example, to guarantee a well-formed verbal complex structure in Korean, the head verb needs to select a certain form of the governed verb, and the selected verb (or verbal complex) must combine first with the head, before the arguments of the selected verb are discharged. A straightforward way to capture this fact is to posit that a certain lexical entry selects only a certain form of a verb, and that there is a rule which licenses their combination, which is exactly what we proposed. Once this kind of lexicon-based system is adopted, which is anyway necessary for correct descriptions of the given facts, we may totally eliminate the reanalysis rule whose formal status is unclear.

The other advantage bears on the applicability range of argument attraction and

θ-role association. As mentioned above, in Haegeman and Riemsdijk's (1986) framework, internal θ-role association between the governed verb and the governing verb occurs only when two verbs are reanalyzed as a verbal complex. As will be discussed in the next chapters (chapters 4 and 5), however, such internal θ-role association also seems to be required to account for long-distance scrambling in Korean. However, the notion of θ-role association cannot be extended or generalized into the account of this phenomenon since the governed and governing verbs are not reanalyzed as a verbal complex in this case, i.e., a syntactic material can intervene between the governed and governing verbs. In contrast, we can use the same argument attraction to account for the same phenomenon by simply changing the selection mechanism, i.e., by lexically specifying that the governed verb is selected by the governing verb's COMPS list, rather than by the GOV list, and that the COMPS list of the governed verb is attracted to that of the governing verb. The flexibility of our system is due to the fact that argument attraction is based not on configuration but on structure sharing within a lexical entry. See section 4.4 in chapter 4 for detailed discussion about this.

In this section, we have tried to show that the complex-predicate analysis enriched by argument attraction can provide an appropriate account of the AUX construction in Korean. We also compared our analysis with the verb projection raising analysis. In the next subsection, we will discuss the alternative analysis, which is called flat-structure analysis. The notion of argument attraction is also crucial on this analysis.

3.3.2. Flat-Structure Analysis

This analysis says that an AUX, its complement verb, and the subject and complements of the governed verb are all sisters. To license (21a), repeated below, in the flat-structure analysis, we need an ID schema like (39a), one of whose instances is (39b):

(21) a. Mary-ka   ku chayk-lul   ilke   poko   issta.
        Mary-Nom   the book-Acc   read   try   be in the process of
        'Mary is trying reading the book.'

(39) a. S → Subj, Comp*, H

     b. S → NP, NP, V[-AUX], V[+AUX], V[+AUX]

(39a) says that a sentence consists of a subject daughter and arbitrary number of complement daughters and a lexical head. (39b) as one of the instances of (39a) licenses (21a). This analysis is also based on the assumption that an AUX is allowed to attract the complement(s) of the verb it governs. That is, the COMPS list of the verb governed by the AUX is attracted to the COMPS list of the AUX. For example, the valence features for the AUX *iss* 'be in the process of' is as follows:

(40) *iss*
```
+-                                            -+
|  SUBJ [1]                                    |
|  COMPS V[VFORM ko, SUBJ [1], COMPS [2]]|[2]  |
+-                                            -+
```

(40) states that the SUBJ list and the COMPS list of the governed verb are attracted to those of the AUX, so that *iss* is treated as a kind of subject-controlled verb. Under this analysis, (21a) is analyzed as follows:

(41)
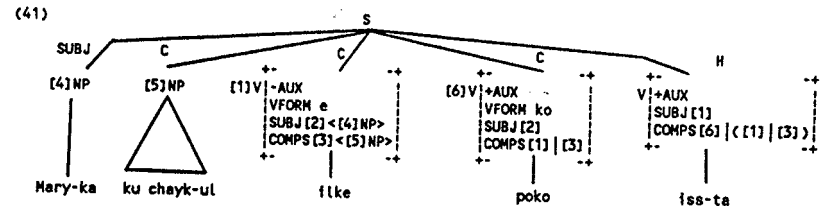
On this approach, the problems of passivization and case alternation caused in the VP- or S-complement analyses do not occur due to argument attraction. For example, in (7), repeated below, the arguments (the subject and the object) of *phala* 'sell' is attracted to the AUX *chiwe* 'do resolutely', and then to the passive AUX *cita* which is the head of the sentence. Then by the lexical entry of the AUX *ci* in (42), which is a variation of (28), the typical passive valence-alternation is licensed: object → subject, and subject → PP[*uyhay*].

(7)   b. Malssengmanhun so-ka   (ku nongpwu-eyuyhayse) phala
          troublesome   cow-Nom the farmer-by   sell
          chiwe-ci-essta.
          do resolutely-passive-past
          'The troublesome cow was resolutely sold (by the farmer).'

$$
\begin{array}{ll}
(42) & \begin{bmatrix} \text{SUBJ} & \langle[2]\text{NP}[str]\rangle \\ \text{COMPS} & V\begin{bmatrix} \text{SUBJ}\langle\text{NP}[str]::[1]\rangle, \\ \text{COMPS}\langle[2]\text{NP}[str]|[3]\rangle \end{bmatrix} |[3]\oplus(\text{PP}[uyhay]::[1]) \end{bmatrix}
\end{array}
$$

(42) indicates (i) that the passive AUX *ci* takes a verb as its complement, (ii) that the primary object of the complement verb (i.e., [2]NP[*str*]) is attracted to the SUBJ list of the AUX, (iii) that the rest of the COMPS list of the complement, represented by [3], is attracted to the COMPS list of the AUX, and (iv) that the subject of the complement verb (i.e., NP[*str*]::[1]) is coindexed with PP[*uyhay*]::[1] which is added to list [3]. (See (28) to see what ⊕ stands for.)

In the case of case alternation by the emotion AUX *siph* 'want', which is shown in (12b) and repeated below, the arguments of *mekko* 'eat' is attracted to the head *siphta* 'want'. Then nominative case is assigned to the object NP by the one of the lexical entries of the emotion AUX in (43), which is a variation of (30b).

(12) b. Nay-ka   sakwa-ka   mekko   siphta.
         I-Nom   apple-Nom   eat   want
         'I want to eat an apple.'

$$
\begin{array}{ll}
(43) & \begin{bmatrix} \text{SUBJ} & [1], \\ \text{COMPS} & V\begin{bmatrix} \text{SUBJ} [1], \\ \text{COMPS NP}[str]::[3]|[4] \end{bmatrix} | \text{NP}[nom]::[3]|[4] \end{bmatrix}
\end{array}
$$

(43) indicates (i) that the emotion AUX takes a verb as its complement, (ii) that the first NP of the complement verb, represented by NP[*str*]::[3], has structural case and is coindexed with the first NP of the AUX's COMPS list, (iii) nominative case is lexically

assigned to the coindexed first NP of the AUX (i.e., NP[*nom*]::[3]), and (iv) that the rest list of the COMPS list of the complement verb, represented by [4], is attracted to the COMPS list of the AUX.

An important matter in this flat-structure analysis is how we can provide an appropriate restriction on linear order among the AUXs. If we assume the LP constraint in (44), the correct surface order of the above sentence is predicted. (44a) states the order between a non-head V[+AUX] and head V[+AUX], while (44b) captures the order between a V[-AUX] and the V[+AUX] governing it. (Here X < Y represents X immediately precedes Y.)[12]

(44) a.   X < HEAD

      b.   V[-AUX] < V[+AUX]

However, these statements cannot give the correct order among the non-head AUXs, and hence cannot eliminate ill-formed sentences such as the one in (45b):

(45) a. Nay-ka   ttuye   poko   siphkey   toyessta.
         I-Nom   run   try   want   became
         'I came to want to try running.'

      b. *Nay-ka   ttuye   toyko   pokey   siphessta.
         M-nom   fly   become   try   wanted
         'I wanted to try coming to run.'

---

[12]See Zwicky and Nevis (1986), Ojeda (1988) and Kuh (1990) for cross-linguistic motivations for immediate precedence constraints.

To handle this problem, we may need an LP constraint as in (46) instead of the one in (44b), according to which complements (including complement AUXs) always precede the category that subcategorizes for them:

(46)   [1] < [COMPS <...[1]...>]

However, there is still a problem with (46). As shown in the previous section, the main verb and the following AUXs make a strong bond, so that no parenthetical expression can occur between them. However, the above LP constraint cannot eliminate ill-formed sentences such as (3d,iv), repeated below, in which the adverb *hayekan* 'anyway' occurs between the governed verb and the governing AUX.

(3)   d. iv. *Mary-ka sakwa-lul mekko   hayekan issta.
                M-Nom apple-Acc eat   anyway   be in the process of
                'Mary anyway is eating an apple.'

Here all the complements precede the categories that subcategorize for them, in accordance with (46). To correct this problem, we may change (46) to (47), which says that complements immediately precede the category that subcategorizes for them.

(47)   [1] < [COMPS <...[1]...>]

However, the problem with this constraint is that it eliminates well-formed sentences such

as (3d,iii), repeated below, because here the object *sakwa-lul* does not immediately precede the head verb *mekko* that subcategorizes for it.

(3)   d. iii. Mary-ka sakwa-lul hayekan   mekko   issta.
                 M-Nom   apple-Acc anyway   eat   be in the process of
                 'Mary is anyway eating an apple.'

To solve this problem we may further modify the constraint in (47) to the one in (48), which states that a category immediately precedes the category that subcategorizes for it only when the subcategorized-for category is a verb.

(48)   [1]V < [COMPS <...[1]V...>]

However, there is still a problem with (48). To see the problem, consider the value of the COMPS of the head AUX in (41). The COMPS value is the same as <[6]V, [1]V, [5]NP>. It contains two verbs, represented by tags [1] and [6]. Thus (46) states that [1]V as well as [6]V must immediately precede the head AUX that subcategorizes for it. As shown in (41), however, [1]V and the head AUX are actually separated by [6]V.

To solve this problem, we need to say that immediate precedence between the two verbs is required only when one verb is directly selected by the other verb. I.e., in (45), the verb *ttuye* 'run' is directly selected by the AUX *poko* 'try' in that the verb form *-e* of *ttuye* is selected by *poko*, and the AUX *poko* is directly selected by the AUX *issta* 'be in the process of' in that the verb form *-ko* of *poko* is selected by *issta*. The relationship

between the verb *ttuye* and the AUX *issta* is indirect in that the valence feature of *ttuye* is attracted to the AUX *issta* via the AUX *poko*. We can distinguish the directly selected verb from the other verbs in a valence list through order of the elements within the list, i.e., the AUX lexical entries are organized in such a way that the directly selected element is put leftmost in the COMPS list. For example, as shown in (41), [6]V comes leftmost in the COMPS list of *issta* 'be in the process of', and [1]V comes leftmost in the COMPS list of *poko* 'try'. Then we may use the LP constraint as in (49):

(49)   [1]V < [COMPS <[1]V...>]

(49) states that a verb which is directly selected by the other verb must immediately precede the selecting verb. This LP constraint correctly restricts order of the verbal sequence in (45). I.e., (49) states that *ilke* 'read' immediately precedes *poko* 'try', and that *poko* immediately precedes *issta* 'be in the process of', without stating that *ilke* immediately precedes *issta*.

It is hard to argue against the flat-structure analysis on empirical grounds since this analysis enriched with argument attraction and the LP constraint in (49) correctly describes all the given data. However, the complex-predicate analysis discussed in section 3.3.1 seems to be preferable to the flat-structure analysis since the latter cannot provide a good reason why no independent syntactic material can intervene between a verb and its governing AUX. I.e., in the flat analysis, the LP constraint in (49) simply stipulates that nothing can occur between a verb and its governing AUX, while the complex-

predicate analysis says that a verb and its governing AUX form a complex word and that this is the reason why nothing can intervene between them.

3.4. Summary and Conclusion

In this chapter, we discussed the AUX construction in Korean. We proposed that the combination of an AUX and its selected verb form a complex word, and that the formation of the verbal complexes is governed by syntactic principles and rules. The crucial mechanism that drives the analysis is argument attraction, which allows the VALENCE value of a selected verb to be attracted to the VALENCE value of the selecting AUX. By virtue of this mechanism, passivization and case alternation problems involved in the AUX construction are accounted for without any violation of the general assumption on passivization (an object can be passivized only when it is an argument of verb on which a passive morpheme is realized) and standard locality assumptions. On this approach, the arguments of a verbal complex (initially the arguments of the main verb) are all sisters. Thus scrambling in this construction results from the lack of LP constraints among the arguments, as does scrambling in a simplex sentence. (See chapter 2 for scrambling in a simplex sentence.)

In the next chapter, we will show how argument attraction can be extended to accounts of scrambling in various S- and VP-complement constructions (e.g., embedded-clause, control-verb, raising-verb, and causative constructions) and relevant phenomena.

CHAPTER IV

WORD ORDER VARIATIONS IN COMPLEX CLAUSES:

LONG-DISTANCE SCRAMBLING AND ARGUMENT ATTRACTION

In the previous chapter, we have discussed structures of the auxiliary verb construction, proposing that the notion of argument attraction is crucial for accounts of the construction. In this chapter, we will extend the theory of the auxiliary verb construction, proposing that the mechanism of argument attraction is also crucial for accounts of word order variation facts in complex clauses. A complex clause here represents the VP complement constructions (e.g., the control verb construction, the raising verb construction, and the *ha*-causative construction) and embedded clause constructions in which the head verb takes an S as its complement. In Korean, argument(s) of the embedded verb can scramble with argument(s) of the governing verb, as shown in (1) and (2):

(1)   VP Complement Construction

    a. Mary-ka John-hanthey [VP ku chayk-ul ilkulako] seltukhayssta.
       M-Nom J-to the book-Acc read persuaded

       'Mary persuaded John to read the book.'

    b. John-hanthey Mary-ka ku chayk-ul ilkulako seltukhayssta.
       J-to M-Nom the book-Acc read persuaded

    c. Ku chayk-ul Mary-ka John-hanthey ilkulako seltukhayssta.
       the book-Acc M-Nom J-to read persuaded

    d. Mary-ka ku chayk-ul John-hanthey ilkulako seltukhayssta.
       M-Nom the book-Acc J-to read persuaded

    e. Ku chayk-ul John-hanthey Mary-ka ilkulako seltukhayssta.
       the book-Acc J-to M-Nom read persuaded

(2)   Embedded Clause Construction

    a. Nay-ka John-hanthey [S Mary-ka ku chayk-ul ilkesstako]
       I-Nom J-to M-Nom the book-Acc read
       malhay-cwu-essta.
       tell-as a favor for-past

       'I told John that Mary read the book as a favor for him.'

    b. Ku chayk-ul nay-ka John-hanthey Mary-ka ilkesstako
       the book-Acc I-Nom J-to M-Nom read
       malhay-cwu-essta.
       tell-as a favor for-past

    c. Na-nun ku chayk-ul John-hanthey Mary-ka ilkesstako
       I-Top the book-Acc J-to M-Nom read
       malhay-cwu-essta.
       tell-as a favor for-past

The goal of this section is to explore the syntactic mechanism(s) by which such facts about scrambling must be accounted for. What is proposed in this chapter is that scrambling out of VP complements or embedded clauses is not due to the unbounded dependency mechanism such as the SLASH feature percolation in GPSG and HPSG, or A-bar movement in GB, but rather due to argument attraction.

The organization of this chapter is as follows. In section 4.1, we discuss the

existence of a VP constituent in Korean and various data showing different scrambling properties of the different VP-complement constructions. In section 4.2, data involving the S-complement construction are discussed. In section 4.3, we discuss case markings and their effects on scrambling possibilities in complex clauses. In section 4.4, we propose our own theory of word order variations in complex clauses through the mechanisms of argument attraction and lexical rules. Here we also discuss some other relevant phenomena such as afterthought expressions and adjunct scrambling. Theoretical predictions of our theory will be discussed in the next chapter (chapter 5).

4.1. VP-Complement Constructions in Korean

In this section, we discuss the existence of a VP constituent and various kinds of VP-complement constructions, focusing on facts about word order variations among the arguments of the main verb and those of an embedded verb. As for scrambling of adjuncts, see section 4.4.4.2

4.1.1. VP constituent in Korean

In chapter 2, we proposed that Korean has a flat clause structure. Then the question arises whether a VP constituent exists at all in Korean. In this section, we will propose an answer to the question. Even though in chapter 2, we proposed that Korean does not have a VP node that makes the clausal structure hierarchical, it does not necessarily follow that

Korean does not have a VP constituent at all. What we propose in chapter 2 is weaker than that. There we simply suggest that Korean does not have a schema like (3) which says that an S consists of a subject and a predicate VP:

(3) Head-Subject Schema:

X"[SUBJ < >] → [1]Y",   X"[SUBJ <[1]>]
                    SUBJ   HEAD

Actually, we have data which show that verbs such as control or raising verbs subcategorize for a VP. In this case, we need to assume a VP constituent which is one of the complements of a particular lexical head and thus is a sister to the head. In this theory, the sentence in (1a) is licensed by the flat schema in (4):

(4)   Head-Subject-Complement-Schema:

X"[SUBJ < >] → X[SUBJ <[1]>, COMPS[2]], [1]Y",   [2]
                    HEAD   SUBJ   COMPS

The relevant data will be discussed shortly.

It is not a new idea to assume that only a certain type of VP constituent exists in a language. According to Borsley (1989), the normal order in a finite clause in Welsh is verb-subject, as shown in (5):

(5)   Gwelodd Emrys y ddraig.
       saw   Emrys the dragon
       'Emrys saw the dragon.'

However, the normal order in a nonfinite clause is subject-verb, as illustrated in (6):

(6)   Disgwyliodd Emrys [i Gwyn weld Megan].
        expected   Emrys   to Gwyn see   Megan
        'Emrys expected Gwyn to see Megan.'

To account for these facts about Welsh word order and related phenomena, Borsely proposes that a finite clause in this language is licensed by the schema in (7) which says that a sentence consists of an arbitrary number of complement daughters and a lexical head, while a nonfinite clause is licensed by the schema in (3).

(7)   S → C*, V

Thus, on this accounts, the structure of (6) is as follows:

(8)   [S Disgwyliodd Emrys [S' i [S Gwyn [VP   weld Megan]]]].
        expected   Emrys   to   Gwyn   see   Megan
        'Emrys expected Gwyn to see Megan.'

Kuh (1990) independently claims that Tamil has a flat finite clause structure but has a nonfinite VP constituent. According to him, a subject, an object and a verb can occur in any order in Tamil when the object is marked with accusative case. To account for this freedom of word order, he assumes that Tamil has a flat clause structure and has no rule as in (3). However, he assumes that an infinitival VP exists which is

subcategorized for by a control verb like *anuppi* 'send', as shown in (9):

(9)   a. Naan   raaman-e   [VP kkannan-e   ppaakk-a] anuppineen.
         I-Nom   Raman-Acc   Kannan-Acc   see-Inf   sent-1.SG

         'I sent Raman to see Kannan.'

      b. Naan   [VP kkannan-e   ppaakk-a] raaman-e   anuppineen.
         I-Nom   Kannan-Acc   see-Inf   Raman-Acc   sent-1.SG

In this construction, an argument within a VP complement cannot permute with any of the control verb's sisters, even though a subject of a control verb, the controller *raaman-e*, and the VP complement can occur in any order. Kuh states that this fact cannot be explained satisfactorily unless we assume that an infinitival VP category exists in this construction and that the sentences in (9) is licensed by the rule in (4). In Kuh (1990), the existence of a nonfinite VP in Tamil is also supported by the fact that finite verbal forms may not be coordinated in any circumstances while certain nonfinite verb forms can.

Then what about in Korean? Is there any evidence showing the existence of VP constituents in Korean? There seem to be at least two pieces of evidence that suggest the existence of a VP constituent which is subcategorized for by control and raising verbs. First, let us consider the examples in (10b,c) where the verbal form *ku chayk-ul ilkulako* 'to read the book' and *ilkulako* 'read' are afterthought expressions, respectively.

(10) a. Mary-ka   John-ul/-hanthey ku chayk-ul   ilkulako   seltukhayssta.
        M-Nom   J-Acc/-to   the book-Acc read   persuaded

   'Mary persuaded John to read the book.'

   b. Mary-ka   John-ul/-hanthey seltukhayssta, ku chayk-ul   ilkulako.
      M-Nom   J-Acc/-to   persuaded   the book-Acc   read

   c. * Mary-ka   John-ul/-hanthey ku chayk-ul   seltukhayssta, ilkulako.
        M-Nom   J-Acc/-to   the book-Acc persuaded   read

In Korean, a lexical expression cannot be used as an afterthought expression, and thus the sentence in (10c) in which the embedded verb *ilkulako* 'read' alone is used as an afterthought expression is not acceptable. If we do not assume the existence of a VP category (VP complement), there is no way to form (10b) without assuming that the embedded verb is an afterthought expression, and it is hard to explain its acceptability. However, if we assume a VP category, we can simply account for (10b) since in this case, the afterthought expression is not a lexical category but a phrasal category, a VP. See sections 4.1.2 and 4.4 for more detailed discussion on the afterthought construction.

Another piece of evidence for a VP constituent is provided by the raising verb construction. Let us consider the examples in (11):

(11) a. Mary-ka   John-ul   New York-ey isstako   mitnunta.
        M-Nom   J-Acc   New York-at exist   believe

   'Mary believes John to be/stay at New York.'

   b. ??/* New York-ey Mary-ka John-ul   isstako mitnunta.
           New York-at M-Nom   J-Acc   exist believe

   c. ??/* Mary-ka   New York-ey John-ul   isstako mitnunta.
           M-Nom   New York-at J-Acc   exist   believe

In the raising verb construction, a constituent (*New York-ey*) which is directly governed by the embedded verb (*isstako* 'exist') cannot be scrambled with the arguments (*Mary-ka* and *John-ul*) which are directly governed by the raising verb (*mitnunta* 'believe'), as in the control verb construction in Tamil (cf. (9)). As proposed in Kuh (1990), this fact can be straightforwardly accounted for if we assume that *New York-ey isstako* 'to be/stay in New York' forms a VP constituent. See sections 4.1.3 and 4.4 for more detailed discussion on the raising verb construction.[1]

From the discussions above, we may conclude that Korean does not have the rule in (3) but has a VP constituent. In the following sections, we will discuss varoius kinds of VP-complement constructions such as the control verb construction, the raising verb construction, and the *ha*-causative construction, focusing on the facts about scrambling.

4.1.2. Control Verb Constructions in Korean

Examples of control verb constructions in Korean are in (12). (The examples in (1) are also the control verb construction.)

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[1]In theories like GB, the VP complements in (10) and (11) are considered to be a clause with the PRO subject for the satisfaction of the extended projection principle. In the HPSG framework that is assumed in this thesis and other theories such as LFG, GPSG, and CG, however, the extended projection principle and an empty category such as PRO are not posited. Thus, in these theories, the VP complement is simply a VP and cannot be a clause.

(12)   a.   Mary-ka   John-hanthey   [VP   ku cengchayk-ul   sihaynghalako]
              M-Nom   J-to   the policy-Acc   carry out
              cisihayssta.
              ordered
              'Mary ordered John to carry out the policy.'

       b.   Mary-ka   John-ul   [VP ku cengchayk-ul   sihaynghakey]
              M-Nom   J-Acc   the policy-Acc   carry out
              mantulessta.
              made
              'Mary made John carry out the policy.'

       c.   Mary-ka   John-hanthey   [VP   ku cengchayk-ul   sihaynghalilako]
              M-Nom   J-to   the policy-Acc   carry out
              yaksokhayssta.
              promised
              'Mary promised John to carry out the policy.'

Here the control verbs *cisihayssta* 'ordered', *mantulessta* 'made' and *yaksokhayssta* 'promised' subcategorize for a VP complement and select its verb form. In (12a,c), the control verbs select the verb form -*ko*, e.g., *sihaynghala-ko* 'carry out' in (12a), while in (12b), the control verb selects the verb form of -*key*, e.g., -*key* in *sihaynghala-key* 'carry out'. (See section 4.4.3 for more detailed discussion of verbal morphology.) In the HPSG framework, lexical entries of the object-control verb in (12a) and the subject-control verb in (12c) are as in (13a) and (13b), respectively:[2]

(13) a. +- +- +-   -+-+-+
          |CAT|VAL|SUBJ <NP[str]::[1]> | | |
          | | |COMPS <NP[dat]::[2], VP[SUBJ <NP[str]::[2]>]::[3]>| | |
          | +- +-   -+-+
          | +-   -+ |
          |CONTENT|RELN ordered| |
          | |ORDERER [1] | |
          | |ORDEREE [2] | |
          | |SOA-ARG [3] | |
          +-   +-   -+   -+

      b. +- +- +-   -+-+-+
          |CAT|VAL|SUBJ <NP[str]::[1]> | | |
          | | |COMPS <NP[dat]::[2], VP[SUBJ <NP[str]::[1]>]::[3]>| | |
          | +- +-   -+-+
          | +-   -+ |
          |CONTENT|RELN promised| |
          | |PROMISER [1]| |
          | |PROMISEE [2]| |
          | |SOA-ARG [3] | |
          +-   +-   -+   -+

In (13a), the SUBJ value of the VP complement (NP::[2]) is coindexed with the NP[*dat*] complement, representing that the controller of the VP is the secondary object of the control verb. In (13b), the SUBJ value of the VP (NP::[1]) is coindexed with the SUBJ value of the control verb, representing that the controller of the VP is the subject of the control verb.[3]

It is still controversial whether the complement NP[*dat*] in (13) is a PP headed by the postposition *hanthey* 'to' or an NP with dative case which is realized as *hanthey*. If an expression like *John-hanthey* is an NP with dative case, the case of the NP must be specified in a lexical entry, as shown in (13), because dative case is marked case

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[2]Some more object-control verbs in Korean are *kangyohata* 'compel', *malhata* 'tell', *canglyehata* 'encourage', *caychokhata* 'urge', *pwuthakhata* 'ask', *helakhata* 'allow', *sikhita* 'make', and so on. And other subject-control verbs are *mayngseyhata* 'vow', *sitohata* 'try', *tonguyhata* 'agree', and so on.

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[3]A more general account of complement control is proposed in chapter 7 in Pollard and Sag (1994). In this dissertation, we use the simplified version of lexical entries since it has no effect on current discussion.

compared with nominative or accusative case.[4] If *John-hanthey* is a PP, the VALENCE value of the lexical entry in (13a) for example needs to be changed into (14):

(14)
```
    +-                                                      -+
    |SUBJ <NP[str]::[1]>                                      |
    |COMPS <PP[hanthey]::[2], VP[SUBJ <NP[str]::[2]>]:[3]>|
    +-                                                      -+
```

No matter exactly what category is the controller, PP[*hanthey*] or NP[*dat*], it is important to realize that not the whole SYNSEM value of the subject of the VP complement is structure-shared with the controller in (14). If the whole SYNSEM values of the controller and the subject of the VP complement were assumed to be structure-shared, it would amount to assuming that the subject of a VP is also a PP[*hanthey*] or NP[*dat*]. In the current framework, however, there is no way to get their whole SYNSEM values structure-shared because they cannot be unified due to a category mismatch, i.e., the controller is a PP or an NP with dative case, whereas the understood subject of a VP complement is an NP with structural case.[5] From now on, we will

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[4]The literature on relational grammar and other literature on grammatical relations have treated nominative and accusative as a natural class of cases, as apposed to dative and other oblique cases. A motivation for this is that dative case is the most oblique case among the three cases, nominative, accusative and dative, in many languages, e. g., we can find many sentences in Korean consisting of only nominative, or only nominative + accusative, or only nominative + accusative + dative, but cannot or rarely find sentences consisting of only accusative + dative or nominative + dative. Kang (1988) points out that in Korean *insahata* 'greet' subcategorizes for only nominative and dative NPs.

[5]Alternatively, we may specify that the whole SYNSEM value of the controller and the subject of the VP complement is structure-shared in the VP-complement construction. A problem with this specification is that it results in undermotivated proliferation of lexical entries. According to this analysis, the subject of the VP complement in sentences such as (10) can be either an NP[*dat*] or an NP[*str*], which

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assume that *-hanthey* is a dative case marker attached to an NP for expository convenience, though nothing hinges on this choice.

In the context of the current discussion, of particular interest are facts about scrambling. As shown in (15), the order of the subject, the controller, and the VP complement is free.

(15) a. Mary-ka   John-hanthey   [$_{VP}$ ku chayk-ul   ilkulako] seltukhayssta.
          M-Nom   J-to   the book-Acc   read   persuaded

          'Mary persuaded John to read the book.'

      b. Mary-ka   [$_{VP}$ ku chayk-ul ilkulako] John-hanthey seltukhayssta.
          M-Nom   the book-Acc read   J-to   persuaded

      c. John-hanthey Mary-ka   [$_{VP}$ ku chayk-ul   ilkulako] seltukhayssta.
          J-to   M-Nom   the book-Acc   read   persuaded

      d. John-hanthey [$_{VP}$ ku chayk-ul ilkulako] Mary-ka   seltukhayssta.
          J-to   the book-Acc read   M-Nom   persuaded

      e. [$_{VP}$ Ku chayk-ul   ilkulako] John-hanthey Mary-ka seltukhayssta.
                    the book-Acc   read   J-to   M-Nom   persuaded

      f. [$_{VP}$ Ku chayk-ul   ilkulako] Mary-ka John-hanthey seltukhayssta.
                    the book-Acc   read   M-Nom   J-to   persuaded

In addition to (15), afterthought expressions are also possible in colloquial style. Any phrasal constituent(s) can occur at the postverbal position, which allows many more possible permutations. (16) shows only some examples of afterthought expressions, which

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entails that a nonfinite verb such as *ilkulako* 'read' must have two separate lexical entries: one with a dative subject, and the other with a structural-case subject. In our coindexing analysis, however, the subject of a nonfinite verb always has only structural case. .

are variations of (15a):

(16)   a.   [_{VP}   Ku chayk-ul   ilkulako]   seltukhayssta,
            the book-Acc   read   persuaded
            Mary-ka John-hanthey.
            M-Nom   J-to
        'Mary persuaded John to read the book.'

        b.   Mary-ka John-hanthey [_{VP}   ilkulako] seltukhayssta, ku chayk-ul.
          M-Nom   J-to   read   persuaded   the book-Acc

        c.   Mary-ka John-hanthey seltukhayssta, [_{VP}   ku chayk-ul   ilkulako].
          M-Nom   J-to   persuaded   the book-Acc read

More interestingly, an argument of a governed verb (e.g., *ilkulako* 'read' in (15))

can also be scrambled with arguments of the control verb, as shown in (17):

(17)   a.   Ku chayk-ul   Mary-ka   John-hanthey   ilkulako   seltukhayssta.
          the book-Acc   M-Nom   J-to   read   persuaded

           'Mary persuaded John to read the book.'

        b.   Mary-ka ku chayk-ul John-hanthey   ilkulako   seltukhayssta.
          M-Nom   the book-Acc J-to   read   persuaded

However, the (b) sentences in (18)-(19), where the object (*ku chayk-ul* 'the book') of the

governed verb (*ilku(li)lako* 'will read') linearly follows the verb, are not allowed:

(18)   a.   Mary-ka John-hanthey ku chayk-ul   ilkulako
          M-Nom   J-to   the book-Acc read
          seltukhayssta/cisihayessta.
          persuaded/ordered

          'Mary persuaded/ordered John to read the book.'

        b.   *Mary-ka John-hanthey ilkulako   ku chayk-ul
          M-Nom   J-to   read   the book-Acc
          seltukhayssta/cisihayessta.
          persuaded/ordered

(19)   a.   Mary-ka John-hanthey ku chayk-ul   ilku-lilako   yaksokhayssta.
          M-Nom   J-to   the book-Acc read-will   promised

          'Mary promised John to read the book.'

        b.   *Mary-ka John-hanthey ilku-lilako ku chayk-ul   yaksokhayssta.
          M-Nom   J-to   read-will   the book-Acc   promised

It might be assumed that it is not correct to posit a syntactic constraint, whatever

it is, that eliminates sentences such as (18b) and (19b),[6] when we consider sentences in

the following:

(20)   a.   Mary-ka John-hantey ku cengchayk-ul sihaynghalako cisihayessta.
          M-Nom   J-to   the policy-Acc   carry out   ordered

          'Mary ordered John to carry out the policy.'

        b.   Mary-ka John-hantey sihaynghalako   ku cengchayk-ul cisihayessta.
          M-Nom   J-to   carry out   the policy-Acc   ordered

---

[6]See section 4.4.1.1 for the syntactic constraint proposed to rule out sentences
such as (18b) and (19b).

(21) a. Mary-ka   John-hanthey sakwa-lul   mekulako   kwenhayssta.
      M-Nom   J-to   apple-Acc   eat   offered

    'Mary offered an apple to John to eat.'

  b. Mary-ka   John-hanthey mekulako   sakwa-lul   kwenhayssta.
      M-Nom   J-to   eat   apple-Acc   offered

These sentences look like a control verb construction but seem to allow an object of a governed verb to linearly follow the verb.

Actually, however, the sentences in (20b) and (21b) are not examples of control verb constructions and thus not an exception to a constraint that syntactically eliminates sentences like (18b) and (19b). The verbs *cisihata* 'order' or *kwentata* 'offer' in (20b) and (21b) can also be used as ditransitive verbs like *cwuta* 'give' and take as their complement two objects (primary and secondary objects), as shown in (22):

(22) a Mary-ka   John-hanthey ku cengchayk-ul cisihayessta.
      M-Nom   J-to   the policy-Acc   ordered
    Lit. 'Mary ordered the policy to John.'

  b. Mary-ka   John-hanthey sakwa-lul   kwenhayssta.
      M-Nom   J-to   apple-Acc   offered
    'Mary offered an apple to John.'

What we assume here is that the sentences in (20b) and (21b) are instances of the ditransitive verb *cisihayssta* and *kwentata* as in (22), and that the verbal expression like *sihaynghalako* 'carry out' and *mekulako* 'eat' in (20b) and (21b) are a kind of purpose adjunct. This view is supported by the following observation.

A difference between (a) sentences in (18) and (19) on the one hand, and (b) sentences in (20) and (21) on the other hand arises when the embedded verb is negated. The sentences in (18a) and (19a) do not show any awkwardness when the embedded verb *ilkulako* 'read' is negated, as shown in (23). By contrast, the sentences in (20b) and (21b) sound like contradictions and become awkward when the embedded verbs *sihaynghalako* 'carry out' and *mekulako* 'eat' are negated, as shown in (24):

(23) a. Mary-ka   John-hantey   ku chayk-ul   ilkci-malako
      M-Nom   J-to   the book-Acc read-not
    seltukhayssta/cisihayessta.
    persuaded/ordered
    'Mary persuaded/ordered John not to read the book.'

  b. Mary-ka   John-hantey   ku chayk-ul   ilkci-anhu-lilako   yaksokhayssta.
      M-Nom   J-to   the book-Acc read-not-will   promised
    'Mary promised John not to read the book.'

(24) a. #Mary-ka John-hantey   sihaynghaci-malako   ku cengchayk-ul   cisihayessta.
      M-Nom   J-to   carry out-not   the policy-Acc   ordered
    'Mary ordered the policy to John (not to be carried out).'

  b. #Mary-ka   John-hanthey   mekci-malako   sakwa-lul   kwenhayssta.
      M-Nom   J-to   eat-not   apple-Acc   offered
    Lit. 'Mary offered an apple to John not to eat it.'

The sentences in (24), however, no longer have such awkwardness when the object precedes its governing verb, as shown in (25):

(25) a. Mary-ka   John-hantey   ku cengchayk-ul   sihaynghaci-malako
      M-Nom   J-to   the policy-Acc   carry out-not
      cisihayessta.
      ordered
      'Mary ordered John not to carry out the policy.'

   b. Mary-ka   John-hanthey   sakwa-lul   mekci-malako   kwenhayssta.
      M-Nom   J-to   apple-Acc   eat-not   offered
      'Mary recommended John not to eat an apple.'

On our account, the verbs such as *cisihata* 'ordered' and *kwenhata* 'offer, recommend' in (24) and (25) are lexically ambiguous. The verbs in (24) are ditransitive verbs and the verbal expression *sihaynghalako* 'to carry out' and *mekci-malako* 'not to eat' there are purpose adjuncts, whereas the verbs in (25) are control verbs and the verbal expressions there are verbal complement of the control verbs. The awkwardness in (24) arises from a contradiction between the entailment of the meaning of the matrix verb and the purpose adjunct. For example, in (24b), offering something edable to someone entails allowing him/her to eat it. However, the purpose adjunct says the opposite, i.e., the purpose of offering an apple to John is not allow him to eat it. The sentences in (24) get awkward due to this contradiction. The awkwardness of (24a) can be accounted for by the same reason.

From the above observation, we may conclude that sentences like (20b) and (21b) are not exceptions to a constraint that syntactically eliminates unacceptable sentences in (18b) and (19b) where a complement of a verb linearly follows the verb. In section 4.4.1.1, we will discuss what syntactic constraint would be appropriate for this kind of constraint on scrambling.

The control verb constuction in Korean discussed above is similar to the so-called "optionally coherent" construction in German that has been discussed since Bech (1955). In this German construction, either a VP complement constituent exists or the head verb of the VP complement and the matrix verb form a verbal complex. Only in the latter case, the arguments of the complement verb can scramble with arguments of the matrix verb. For example, the control verb construction in German can have two different structures, as shown in (26):

(26) a. Er hat den Wagen   [V zu reparieren   versprochen].
        he has the car   to fix   promised
      'He has promised to fix the car.'

   b. Er hat [VP   den   Wagen   zu reparieren]   versprochen.
      he has   the   car   to fix   promised

However, scrambling in the control verb construction in Korean is less restrictive than that in the German construction in that the following sentences are also allowed:

(27) a. Ku chayk-ul   John-hanthey   ilkci-malako   Mary-ka   cisihayssta.
        the book-Acc   J-to   read-not   M-Nom   ordered
      'Mary ordered John not to read the book.'

   b. Ku chayk-ul   Mary-ka   ilkci-malako   John-hanthey   cisihayssta.
      the book-Acc   M-Nom   read-not   J-to   ordered

In (27), neither the VP complement constituent [*ku chayk-ul ilkci-malako*] 'not to read

the book' exists, nor the embedded complex verb *ilkci-malako* 'not to read' and the matrix verb *cisihayssta* 'ordered' form a verbal complex.

The sentences in (17) and (27) show that an argument of a governed verb can be scrambled with arguments of the governing verb when the governing verb is a control verb. However, when the governing verb is a raising verb, that kind of scrambling does not seem to occur. I.e., in the control verb construction, scrambling out of the VP complement is relatively free, while in the raising verb construction, scrambling seems to be more restricted. In the following section, we will discuss the raising verb construction.

4.1.3. Raising-to-Object Verb Construction[7]

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[7]In Korean, the raising-to-subject construction is an instance of the verbal complex construction, which is headed by an AUX such as *pota* 'seem', *tushata* 'seem, look like', etc. In this construction, NP arguments can scramble with each other (ia,b). However, the governed verb and the AUX cannot be separated by syntactic material (ic,d) or by making the governed verb an afterthought expression (ie). As discussed in chapter 3, these are the typical properties of the verbal complexes in Korean.

(i) a. Mary-ka   ku chayk-ul   ilk-ess-na   pota.
         M-Nom   the book-Acc   read-Past-vform.na seem

    'Mary seemed to read the book.'

    b. Ku chayk-ul   Mary-ka   ilk-ess-na   pota.
        the book-Acc   M-Nom   read-Past-vform.na seem

    c. * Ku chayk-ul   ilk-ess-na   Mary-ka   pota.
           the book-Acc   read-Past-vform.na   M-Nom   seem

    d. * Mary-ka   ku chayk-ul   ilk-ess-na   hayekan   pota.
           M-Nom   the book-Acc   read-Past-vform.na   anyway   seem
           'Anyway Mary seemed to read the book.'

The typical examples of the raising-to-object verb construction are as follows:

(28) Mary-ka   John-ul [VP cengcikhatako]   mitnunta/sayngkakhanta.
      M-Nom   J-Acc   be honest   believe/think
      'Mary believes/thinks John to be honest.

Under the framework of HPSG, a raising verb is similar to a control verb in that both take as their complements a controller NP and a VP whose subject is identical to the controller NP. (cf. Pollard and Sag (1987, 1994) for English, and Yoo (1993) for Korean, among others) However, one difference between them is that a control verb assigns a semantic role (e.g., the roles of ORDEREE and PROMISEE in (13)) to the controller, whereas a raising verb does not assign any semantic role to the controller. The other important difference is that in the control verb construction, the controller and the understood subject of the VP complement are coindexed (roughly, they are only semantically identical), whereas in the raising verb construction, the whole SYNSEM values of the controller and the understood subject of the VP are structure-shared (i.e.,

---

e. * Mary-ka   pota,   ku chayk-ul   ilk-ess-na.
       M-Nom   seem   the book-Acc   read-Past-vform.na

The lexical entry for the raising-to-subject AUX *pota* is as follows:

```
(ii)        +-       +-                                              -+-+
            |CAT|VAL|SUBJ [1]                                         | |
            |       |COMPS [2]                                        | |
            |       |GOV <V[VFROM na, SUBJ [1], COMPS [2]]:[3]>|      | |
            |       +-                                         -+     | |
            |       +-            -+                                  | |
            |CONTENT|RELN seem     |                                  | |
            |       |SOA-ARG [3]|                                     | |
            +-      +-           -+                                  -+ -+
```

See Sells (1990) for a similar analysis.

they are identical syntactically as well as semantically). On this approach, the lexical

entry of the control verb *mitta* 'believe' is as follows:

```
(29)+-   +-   +-                                              -+-+-+
    |CAT|VAL|SUBJ <[1]NP[str]::[2]>                           | | |
    |   |   |COMPS <[3]NP[str]::[4], VP[SUBJ <[3]NP[str]::[4]>]:[5]>| | |
    |   +-  +-                                                -+-+ |
    |       +-               -+                                    |
    |CONTENT|RELN believe|                                         |
    |       |BELIEVER [2]|                                         |
    |       |SOA-ARG [5] |                                         |
    +-      +-           -+                                       -+
```

In Korean, the controller in the raising verb construction is always an NP with

accusative case. Thus, we assign structural case to both the controller and the subject of

the VP complement without any category mismatch, which can be realized as accusative

case or nominative case by the Case Principle mentioned in Chapter 1. In (29), the

controller is a complement daughter and thus has accusative case.

As for scrambling in the raising construction, let us consider the following

examples:

(30) a. Mary-ka   John-ul   [vp   New York-ey   isstako]   mitnunta.
          M-Nom   J-Acc   New York-at   exist   believe

          'Mary believes John to be/stay at New York.'

      b. John-ul   Mary-ka   [vp New York-ey   isstako]   mitnunta.
          J-Acc   M-Nom   New York-at   stay   believe

      c. John-ul   [vp   New York-ey isstako]   Mary-ka   mitnunta.
          J-Acc   New York-at stay   M-Nom   believe

      d. ??/*   Mary-ka   [vp   New York-ey isstako]   John-ul   mitnunta.
                 M-Nom   New York-at stay   J-Acc   believe

      e. ??/*   [vp   New York-ey   isstako]   John-ul   Mary-ka   mitnunta.
                       New York-at   stay   J-Acc   M-Nom   believe

(31) a. Mary-ka   John-ul   [vp   ku tayhak-ey   tanyesstako]   sayngkakhanta.
          M-Nom   J-Acc   the college-at   attended   think

          'Mary thinks John to have attended the collage.'

      b. John-ul   Mary-ka   [vp ku tayhak-ey   tanyesstako]   sayngkakhanta.
          J-Acc   M-Nom   the college-at   attended   think

      c. John-ul   [vp   ku tayhak-ey   tanyesstako]   Mary-ka   sayngkakhanta.
          J-Acc   the college-at   attended   M-Nom   think

      d. ??/*   Mary-ka   [vp   ku tayhak-ey   tanyesstako]   John-ul
                 M-Nom   the college-at   attended   J-Acc
                 sayngkakhanta.
                 think

      e. ??/*   [vp   Ku tayhak-ey   tanyesstako]   John-ul   Mary-ka
                       the college-at   attended   J-Acc   M-Nom
                 sayngkakhanta.
                 think

The above examples show that the subject, the controller and the VP complement can be

scrambled as long as the controller precedes the VP complement. These scrambling

possibilities in the raising verb construction show a sharp contrast with those in the

control verb construction, since such a restriction does not exist in the latter, as shown

in (15).

Afterthought expressions are also more restricted in the raising verb construction

than in the control verb construction, as shown in the sentences in (32) which are

variations of (30a):

(32) a. [$_{VP}$ New York-ey   isstako]   mitnunta, Mary-ka John-ul.
          New York-at   stay   believe M-Nom   J-Acc

'Mary believes John to be/stay at New York.'

b. Mary-ka John-ul   mitnunta, [$_{VP}$ New York-ey   isstako].
   M-Nom   J-Acc   believe   New York-at   stay

c. ?? Mary-ka John-ul   [$_{VP}$ isstako]   mitnunta, New York-ey.
       M-Nom   J-Acc   stay   believe New York-at

(32c) shows that the argument *New York-ey* of the embedded verb is only marginally allowed to be extracted to the postverbal position, while such a restriction does not exist in the control verb construction (cf. (16)).

Also, an argument of the embedded verb is only marginally allowed to be scrambled with the argument(s) of the raising verb, as shown in the examples in (33) which are variations of (30a). Such a restriction does not exist in the control verb construction (cf. (17)).

(33) a. ??/* New York-ey   Mary-ka   John-ul [$_{VP}$ isstako]   mitnunta.
              New York-at   M-Nom   J-Acc   exist   believe

'Mary believes John to be/stay at New York.'

b. ?? Mary-ka New York-ey John-ul [$_{VP}$ isstako]   mitnunta.
      M-Nom   New York-at J-Acc   exist   believe

In the raising verb construction as well as in the control verb construction, an argument of an embedded verb is not allowed to follow the verb, as shown in (34) (cf. (18)-(19) for the control verb construction):

(34) * Mary-ka John-ul   isstako   New York-ey mitnunta.
       M-Nom   J-Acc   exist   New York-at believe
'Mary believes John to be/stay at New York.'

To sum, scrambling possibilities in the raising verb construction are more restricted than those in the control verb construction. It seems that a constituent within the VP complement of the raising verb can be scrambled with the categories outside the VP only with great difficulty, if at all. Also the controller in the raising verb construction must precede the complement VP. In the following section, we will discuss another kind of VP complement construction, the *ha*-causative construction, which shows slightly different scrambling possibilities from the control and raising verb constructions.

4.1.4. *Ha*-Causative Construction

In Kang (1988), No (1991), and Chung (1993a) among others, the causative verb *ha* 'cause' is considered as an auxiliary verb. However, this seems to be not correct because there is an obvious difference between the causative verb *ha* and ordinary auxiliary verbs such as *siph* 'want' and *ha* 'act like', as shown in (35)-(37):

(35) a. Mary-ka John-hanthey/-ul ku chayk-ul   ilkkey hayssta.
        M-Nom   J-to/-Acc   the book-Acc   read   caused

'Mary caused John to read the book.'

b. (?) John-hanthey/-ul ku chayk-ul   ilkkey Mary-ka hayssta.
        J-to/-Acc   the book-Acc read   M-Nom   caused

ha:[8]

(39) a.
```
+- +- +-                        -+-+-+
|CAT|VAL|SUBJ <[1]NP[str]::[2]>| | |
|   |   |COMPS <S:[3]>          | | |
|   +-  +-                      -+-+ |
|       +-            -+             |
|CONTENT|RELN caused|               |
|       |CAUSER [2]  |               |
|       |SOA-ARG [3] |               |
+-      +-           -+          -+
```

b.
```
+- +- +-                                                    -+-+-+
|CAT|VAL|SUBJ <[1]NP[str]::[2]>                             | | |
|   |   |COMPS <[3]NP[str]::[4], VP[SUBJ <[3]NP[str]::[4]>:[5]>| | |
|   +-  +-                                                  -+-+ |
|       +-            -+                                         |
|CONTENT|RELN caused |                                          |
|       |CAUSER [2]   |                                          |
|       |SOA-ARG [5]  |                                          |
+-      +-            -+                                      -+
```

c.
```
+- +- +-                                            -+-+-+
|CAT|VAL|SUBJ <NP[str]::[1]>                        | | |
|   |   |COMPS <NP[dat]::[2], VP[SUBJ <NP[str]::[2]>]:[3]> | | |
|   +-  +-                                          -+-+ |
|       +-            -+                                 |
|CONTENT|RELN caused |                                 |
|       |CAUSER [1]   |                                 |
|       |CAUSEE [2]   |                                 |
|       |SOA-ARG [3]  |                                 |
+-      +-            -+                             -+
```

(38a) is licensed by (39a) which indicates that the ha takes a sentence as its complement. Here John has nominative case because it is a subject daughter in the S complement.[9] Also note that it does not directly assign any role to the subject of the S

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[8]The lexical entry in (39b) needs to be revised to account for afterthought expressions in this ha-causative construction. See section 4.5 for this matter.

[9]In Korean, nominative case can generally be assigned to the subject of a nonfinite clause, as shown in (i):

(i) a. John-un [s atul-i   tolawa-se]   kippessta.
         J-Top   son-Nom   return-because   was happy

complement, John, and thus it is not necessary to assume that the causer's action is done directly to John. (38b) is licensed by (39b), which indicates that the ha takes as its complement an NP with structural case and a VP whose subject's SYNSEM value, represented by [3], is structure-shared with that of the complement NP. Here the NP complement is marked by accusative case by the Case Principle. As in (39a), this ha assigns no semantic role to the complement NP, and the causer's direct causation to John is not necessarily required. (38c) is licensed by (39c) which indicates that this ha takes as its complement a NP[dat] and a VP. Unlike the other ha's, this ha assigns a causee role to the NP complement and thus the causer's direct causation to the causee is required.

Since we are now discussing VP-complement constructions, let us focus on (38b,c) and (39b,c), postponing the discussion on (38a) and (39a) to section 4.2 where the S-complement construction is discussed. As already suggested, the lexical entry in (39b) looks the same as that of a raising verb (cf. (29)) and the lexical entry in (39c) the same as that of a control verb (cf. (13)). In other words, on our analysis, the ha-causative construction with an accusative controller (accusative ha-causative henceforth) forms a natural class with the raising verb construction, while the ha-causative construction with the NP[dat] controller (dative ha-causative henceforth) forms a natural class with the control verb construction. This classification is also supported by some facts about

---

'John was happy because his son returned.'

b. * John-un [s atul-i   tolaw-ass-se]   kippessta.
          J-Top   son-Nom   return-Past-because was happy

scrambling. As illustrated in (40), the dative *ha*-causative allows the NP complement to occur between the VP complement and the *ha* causative verb, as the control verb construction does (cf. (15b)).

(40)　(?) Mary-ka [vp 　　ku chayk-ul　ilkkey]　John-hanthey　hayssta.
　　　　　M-Nom　　　　the book-Acc　read　　　J-to　　　　　caused
　　　　　'Mary caused John to read the book.'

Even though (40) is slightly marginal, compared with the counterpart in the control verb construction, it is acceptable to most speakers, especially when focal stress is given to the NP controller. The dative *ha*-causative and the control verb construction also show the same distribution in other scrambling and afterthought phenomena, as illustrated in (41).

(41)　a.　Mary-ka　ku chayk-ul　John-hanthey　　　ilkkey　hayssta.
　　　　　　M-Nom　　the book-Acc　J-to　　　　　　　read　　caused

　　　　　　'Mary caused John to read the book.'

　　　　b.　Mary-ka　John-hanthey　　　ilkkey　hayssta,　ku chayk-ul.
　　　　　　M-Nom　　J-to　　　　　　　read　　caused　　the book-Acc

　　　　c.　Mary-ka　John-hanthey　hayssta,　[ku chayk-ul　　　ilkkey].
　　　　　　M-Nom　　J-to　　　　　caused　　the book-Acc　　read

That is, in both constructions, an argument of the embedded verb is allowed to scramble with arguments of the *ha* verb (e.g., (41a); cf. (17)), an argument of the embedded verb can be an afterthought expression (e.g., (41b); cf. (16b)), and the VP complement can be an afterthought expression (e.g., (41c); cf. (16c)).

In contrast, the accusative *ha*-causative and the raising verb construction show the same pattern of scrambling in that neither allows the NP controller to occur between the VP complement and the *ha* verb under any circumstance, as shown in (42): (cf. (30d) for the case of the raising verb construction)

(42)　*　Mary-ka [vp 　　ku chayk-ul　ilkkey]　John-ul　　hayssta.
　　　　　M-Nom　　　　the book-Acc　read　　　J-Acc　　　caused
　　　　　'Mary caused John to read the book.'

However, the accusative *ha*-causative differs from the raising verb construction in that it also has some of the scrambling properties of the control verb construction, i.e., as shown in (43), in the accusative *ha*-causative, an argument of the embedded verb is allowed to be scrambled with the arguments of the *ha* verb, and an argument of the embedded verb can be used as an afterthought expression.

(43)　a.　Mary-ka　cip-ulo　　John-ul　　　　tolakakey　hayssta.
　　　　　　M-Nom　home-to　J-Acc　　　　　go back　　caused

　　　　　　'Mary caused John to go back home.'

　　　　b.　Mary-ka　John-ul　　　　tolakakey　hayssta.　cip-ulo
　　　　　　M-Nom　　J-Acc　　　　　go back　　caused　　home-to

Moreover, the accusative *ha*-causative differs from both the control and raising constructions in that it does not allow the VP complement to be used as an afterthought expression, as shown in (44):

(44) * Mary-ka John-ul hayssta, [$_{VP}$ cip-ulo tolakakey].
M-Nom J-Acc caused home-to go back
'Mary caused John to go back home.'

In section 4.4, we will propose how all the aspects of scrambling and afterthought expressions can be accounted for through the mechanism of argument attraction and lexical rules. The important aspects of scrambling and afterthought expressions that are discussed in this section are summarized in (45):

(45)

	control (equi)	raising	accusative ha-causative	dative ha-causative
placement of the main subject between the embedded verb and the main verb	yes	yes	yes	yes
placement of a complement of the embedded verb between the embedded verb and the main verb	no	no	no	no
scrambling between the VP complement and the controller	yes	no	no	yes
scrambling of an argument of the embedded verb with the argument(s) of the main verb	yes	no	yes	yes
afterthought expression of the VP complement	yes	yes	no	yes
afterthought expression of an argument of the embedded verb	yes	no	yes	yes

4.2. S-Complement Constructions in Korean

In Korean, arguments of an embedded clause also can scramble with arguments of the main verb, as shown in (46) and (47):

(46) a. Nay-ka [$_S$ Mary-ka ku chayk-ul ilkesstako] sayngkakhayssta.
I-Nom M-Nom the book-Acc read thought

'I thought Mary read the book.'

b. Ku chayk-ul nay-ka Mary-ka ilkesstako sayngkakhayssta.
the book-Acc I-Nom M-Nom read thought

(47) a. Mary-ka motun salam-hanthey [$_S$ John-i ku mwuncey-lul
M-Nom all people-to John-i ku mwuncey-lul
J-Nom the problem-Acc
haykyelhaysstako] malhayssta.
resolved told

'Mary told all the people that John resolved the problem.'

b. (?) Ku mwuncey-lul, Mary-ka, motwun salam-hanthey, John-i
the problem-Acc M-Nom all people-to J-Nom
haykyelhaysstako malhayssta.
resolved told

c. ? Mary-ka, ku mwuncey-lul, motwun salam-hanthey, John-i
M-Nom the problem-Acc all people-to J-Nom
haykyelhaysstako malhayssta.
resolved told

(47b,c) are marginal due to some reason that we do not know presently.[10] However, it

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[10]My conjecture is that the awkwardness of (47b,c) may result from a processing factor. Both sentences have an accusative NP and a dative NP, which are typical complements of a ditransitive verb. When speakers process these sentences, they may consider them as simplex clauses headed by a ditransitive verb. However, when the

is still acceptable when short pauses are put between the NP arguments, which are represented by commas.

Also note that any argument(s) of the embedded clause can be used as afterthought expressions. An example is shown in (48):

(48) a. Mary-ka [$_s$ John-i   ku yenghwa-ul   poasstako] sayngkakhayssta.
          M-Nom   J-Nom   the movie-Acc saw   thought

          'Mary thought that John saw the movie.'

  b. afterthought

          Mary-ka [$_s$ John-i   ___   poasstako]   sayngkakhayssta,
          M-Nom   J-Nom   saw   thought
          ku yenghwa-ul.
          the movie-Acc

So far we have shown that the arguments of the embedded verb can generally scramble with arguments of the matrix verb in the control verb, *ha*-causative, and S-complement constructions, without discussing the fact that case marking on arguments can affect scrambling possibilities. In the next section, we will discuss this kind of restriction

---

embedded subject is met, the sentences need to be reprocessed. (47c) may be worse than (47b) because the former has a more canonical word order for the ditransitive verb and thus has more processing interference.

Another way to analyze (47b,c) may be to assume that they are not instances of scrambling but instances of English style topicalization (Bratt (1993)), i.e., extraction out of a finite clause is due to an unbounded dependency mechanism such as the A-bar movement in GB or SLASH percolation in GPSG and HPSG. However, this view is suspicious because no obvious evidence exists which shows that extraction out of an embedded clause must differ from the other extractions. See chapter 5 for detailed discussion on this.

on scrambling.

4.3. Case Marking and Restrictions on Scrambling in Complex Clauses

In the control verb and *ha*-causative constructions, an accusative or dative NP argument of an embedded verb cannot scramble with the controller when they have the same marker, as shown in (49)-(51):

(49) a. Nay-ka   Mary-lul [$_{VP}$ ku sakwa-lul   mekkey] mantulessta.
          I-Nom   M-Acc   the apple-Acc   eat   made

          'I made Mary eat the apple.'

  b. * Nay-ka   ku sakwa-lul Mary-lul   mekkey   mantulessta.
            I-Nom   the apple-Acc M-Acc   eat   made

  c. * Ku sakwa-lul nay-ka   Mary-lul   mekkey   mantulessta.
            the apple-Acc I-Nom   M-Acc   eat   made

(50) a. Nay-ka   Mary-lul [$_{VP}$ ku hakkyo-lul   pangmwunhakey] hayssta.
          I-Nom   M-Acc   the school-Acc   visit   caused

          'I caused Mary to visit the school.'

  b. * Nay-ka   ku hakkyo-lul Mary-lul pangmwunhakey hayssta.
            I-Nom   the school-Acc M-Acc visit   caused

  c. * Ku hakkyo-lul   nay-ka Mary-lul pangmwunhakey hayssta.
            the school-Acc   I-Nom M-Acc   visit   caused

(51) a. Nay-ka   Mary-hanthey   [$_{VP}$ ku toyci-hanthey salyo-lul cwulako]
          I-Nom   M-to   the pig-to   feed-Acc give
          malhayssta.
          told

          'I told Mary to give feed to the pig.'

b. * Nay-ka   ku toyci-hanthey   Mary-hanthey   salyo-lul   cwulako
    I-Nom   the pig-to   M-to   feed-Acc   give
    malhayssta.
    told

c. * Ku toyci-hanthey nay-ka Mary-hanthey   salyo-lul   cwulako
    the pig-to   I-Nom M-to   feed-Acc   give
    malhayssta.
    told

(49b,c), (50b,c) and (51b,c) are hard to be interpreted as having the intended meanings in (49a), (50a) and (51a). For example, (49b,c) must be interpreted as 'I made the apple eat Mary', and (51b,c) as 'I told the pig to give feed to Mary.' Then what kind of constraint should we impose to eliminate this kind of ill-formed sentence? Should it simply be the following constraint on processing that avoids the possibility of ambiguous interpretations?

(52) In general, the greater the likelihood of ambiguous interpretation, the more difficult it is to switch the word order of two NP's marked with the same grammatical formative. (Kuno (1980))

We do not deny that this kind of general constraint may be needed in Korean or Japanese grammar, but we doubt that the ungrammaticality of (49b,c), (50b,c) and (51b,c) only results from a violation of this kind of processing factor. For example, in the real world, apples never eat people, and this pragmatic factor is strong enough to disambiguate the meanings of (49b,c). That is, we may understand the sentences in (49b,c) as having the

intended meaning due to this pragmatic factor, but the sentences are still unacceptable and hardly uttered with the intended meaning in any context. Thus, it seems that we need some syntactic constraint on this kind of scrambling. We will discuss this constraint in section 4.4.1.1.

Another matter that deserves a discussion is a subject extraction phenomena. Saito (1985) proposes that the subject with nominative case cannot be scrambled at any circumstance. His proposal is based on the observations that an embedded subject with nominative case cannot scramble with arguments of the main verb. The Korean counterparts are shown in (53) and (54):

(53) a. Mary-ka [s John-i cengcikhatako]   sayngkakhanta.
      M-Nom   J-Nom be-honest   think
      'Mary thinks John is honest.'

    b. * John-i   Mary-ka   cengcikhatako   sayngkakhanta.
      J-Nom   M-Nom   be-honest   think

(54) a. Mary-ka motun salam-hanthey   [s John-i   cengcikhatako]
      M-Nom   all people-to   J-Nom   be-honest
      malhayssta.
      told
      'Mary told all people that John was honest.'

    b. * Mary-ka   John-i   motun salam-hanthey   cengcikhatako malhayssta.
      M-Nom   J-Nom   all people-to   be-honest   told

    c. * John-i   Mary-ka   motun salam-hanthey   cengcikhatako malhayssta.
      J-Nom   M-Nom   all people-to   be-honest   told

Saito (1985) assumes that a condition on Case assignment in (55) is responsible for the

lack of subject scrambling.

(55)   Variables must have Case. (Chomsky (1981))

According to him, nominative Case is inherent in that it is not assigned by a lexical

category, and no abstract Case is assigned to the subject position in Japanese. Thus, if

a subject is scrambled, its variable (trace) cannot have Case, which makes (53b) and

(54b,c) unacceptable.

However, Saito's syntactic constraint is too strong because there are at least two

cases where the nominative subject seems to be allowed to be extracted. The first case

is when the main subject has the topic marker, as shown in (56) and (57):

(56)   a.   Ne-nun   [s nwu-ka   olilako]   sayngkakha-ni?
            you-Top   who-Nom   will come   think

            'Who do you think will come?'

       b.   Nwu-ka   ne-nun   olilako   sayngkakha-ni?
            who-Nom   you-Top   will come   think

(57)   a.   Mary-nun   ku kkoch-i   situlesstako   sayngkakhanta.
            M-Top   the flower-Nom   wither   think

            'Mary thinks the flower withers.'

       b.   Ku kkoch-i   Mary-nun   situlesstako   sayngkakhanta.
            the flower-Nom   M-Top   wither   think

Saito notices that (56b) and (57b) may be counterexamples to his analyses. To avoid this

problem, he just assumes that the NPs with the topic marker in (56) and (57) are used

as parenthetical expressions. However, as acknowledged by Saito himself, there is no

evidence for the parenthetical usage of the topic NP. Moreover, this assumption is very

suspicious because the grammatical function of the NPs with the topic marker in (56) and

(57) is the subject of the matrix verb. It is not clear how a matrix subject can be a

parenthetical.

Afterthought examples in (58) below also suggest that Saito's Case constraint on

subject scrambling may be too strong:

(58)   a.   Mary-ka   ku chayk-ul   ilkessta.
            M-Nom   the book-Acc   read

            'Mary read the book.'

       b.   Ku chayk-ul   ilkessta,   Mary-ka.
            the book-Acc   read   M-Nom

It is controversial whether an afterthought expression is a syntactically extracted

constituent or not. According to Kuno (1978), a post-verbal element is restricted to either

an element which can be deleted without any substantial change in the meaning of the

sentence or an element which represents supplementary information.[11] Following Kuno,

Saito (1985) assumes that the afterthought phenomena is just a stylistic matter and does

---

[11]Contrary to Kuno, however, Kim (1985), Choe (1987), Whitman (1990) and Yoo(1992) report that some focused or unexpected expression can also be a postverbal element, even though it cannot be a *wh*-word in a *wh*-question or an answer to a *wh*-question.

not involve any syntactic extraction. A serious problem for this assumption, however, is that the distribution of post-verbal elements is restricted by a syntactic context (Choe (1987) and Whitman (1990)). For example, a constituent is not allowed to extract out of an adjunct to the post-verbal position, as scrambling is not allowed out of an adjunct, as shown in (59) and (60):

(59) a. Mary-ka [NP [S ku yenghwa-lul an pon] salam-ul]
M-Nom the movie-Acc not see person-Acc
mannaci moshayssta.
meet did not

'Mary did not meet any person who did not see the movie.'

b. afterthought

* Mary-ka [NP [S ____ an pon] salam-ul] mannaci
M-Nom not see person-Acc meet
moshayssta, ku yenghwa-lul.
did not the movie-Acc

c. scrambling

* Ku yenghwa-lul Mary-ka [NP [S ____ an pon] salam-ul]
the movie-Acc M-Nom not see person-Acc
mannaci moshayssta.
meet did not

(60) a. Mary-ka [S kicha-ka ku yek-ey imi tochakhaysski ttaymwuney]
M-Nom train-Nom the station-at already arrive because
pyo-lul howanpwulhayssta.
ticket-Acc refunded

'Mary refunded a ticket because the train already arrived at the station.'

b. afterthought

* Mary-ka [S kicha-ka ____ imi tochakhaysski ttaymwuney]
M-Nom train-Nom already arrive because
pyo-lul howanpwulhayssta, ku yek-ey.
ticket-Acc refunded the station-at

c. scrambling

* Ku yek-ey Mary-nun [S kicha-ka ____ imi tochakhaysski
the station-at M-Top train-Nom already arrive
ttaymwuney] pyo-lul howanpwulhayssta.
because ticket-Acc refunded

Also note that a constituent cannot be extracted out of a sentential subject to be an afterthought expression, as an argument of the sentential subject cannot scramble with an argument out of a sentential subject. The examples are illustrated in (61):[12]

(61) a. [S Mary-ka ku yenghwa-lul pon kes]-i motwu-eykey
M-Nom the movie-Acc saw COMP-Nom all-to
palkhieciessta.
become known

'It became known to all (people) that Mary saw the movie.'

b. afterthought

*[S Mary-ka ____ pon kes]-i motwu-eykey palkhieciessta,
M-Nom saw COMP-Nom all-to become known
ku yenghwa-lul.
the movie-Acc

---

[12]In (61), the analysis of *kes* may be controversial. It can be analyzed as a complementizer or as an abstract noun meaning 'thing'. We assume it to be a complementizer which selects a clause whose head verb has a modifier form, following Jhang (1993).

c. scrambling

* Mary-ka motwu-eykey ku yenghwa-lul pon kes-i
M-Nom all-to the movie-Acc saw COMP-Nom
palkhieciessta.
become known

*[s Mary-ka __ pon kes]-i ku yenghwa-lul motwu-eykey
M-Nom saw COMP-Nom the movie-Acc all-to
palkhieciessta.
become known

We cannot simply say that a constituent is not allowed to be extracted out of an embedded clause to the postverbal position, since an afterthought expression and scrambling out of an embedded clause are allowed when the embedded clause is a complement, as shown in (62):

(62) a. Mary-ka [s John-i ku yenghwa-ul poasstako] sayngkakhayssta.
M-Nom J-Nom the movie-Acc saw thought

'Mary thought that John saw the movie.'

b. afterthought

Mary-ka [s John-i __ poasstako] sayngkakhayssta,
M-Nom J-Nom saw thought
ku yenghwa-ul.
the movie-Acc

c. scrambling

Ku yenghwa-ul Mary-ka [s John-i __ poasstako] sayngkakhayssta.
the movie-Acc M-Nom J-Nom saw thought

Kuno (1980) suggests that a sentence with a postverbal expression is unacceptable

when the sentence without the postverbal expression is not interpretable. This may account for the acceptability of some afterthought expression constructions, but not that of (59b), (60b) and (61b) i.e., the sentences in (59b)-(61b) without the postverbal expressions are fully acceptable when *ku yenghwa* 'the movie' or *ku yek-ey* 'the station' is recoverable from the context.

A different way for Saito to avoid the problem may be to assume that an afterthought expression is base-generated and does not involve any syntactic extraction, as with so-called Chinese-style topicalization (Kuno (1973) and Xu and Langendoen (1985)). However, such as assumption would be questionable, because Chinese-style topicalization differs from the afterthought expression in that the topic is generally interpretable as (or coindexable with) an element within an adjunct, as long as the topic and the comment clause satisfy the "aboutness condition" (Kuno (1973)). An example is (63), which is a variation of (59):

(63) Ku yenghwa$_i$-nun Mary-ka [NP [s pro$_i$ an pon] salam-ul]
the movie-Top M-Nom not see person-Acc
mannaci moshayssta.
meet did not
'As for the movie, Mary did not meet any person who did not see it.'

If the afterthought expression were an instance of this kind of topicalization, (59b) would also be predicted to be acceptable. This prediction, however, is not borne out and the unacceptability of (59b) and (60b) remains unexplained.

The data in (59)-(61) can be naturally explained if we assume that an afterthought

expression is subject to a certain syntactic constraint, such as the Condition on Extraction Domains in Huang (1982).[13] If the assumption is correct that an afterthought expression is a syntactic extraction, we can say that the sentence in (58b) is another counterexample to Saito's condition on subject extraction: a subject cannot scramble due to a Case licensing condition. In section 4.4.2, we will propose our own constraint on subject scrambling, which may be considered as an interpretive condition on processing, and we will also suggest an analysis of the afterthought expression phenomena in section 4.4.3.1.

In this and previous two sections, we discussed the basic data that are directly relevant to scrambling in complex clauses, without making any theoretical proposals. In section 4.4, we will (i) propose our own theory of scrambling in complex clauses, based on the notion of argument attraction and lexical rules, and (ii) explore how other directly relevant phenomenon, such as the afterthought construction and adjunct scrambling can be handled in our theory. Theoretical predictions of our theory and alternatives will be discussed separately in the next chapter (chapter 5).

---

[13]Huang's (1982) Condition on Extraction Domain (CED) is as in (i) which roughly says that extraction out of non-complement is prohibited.:

(i)   A phrase A may be extracted out of a domain B only if B is lexically properly governed.

4.4.   Argument Attraction, Lexical Rules and Word Order Variation in Complex Clauses

The main goal of this section is to propose that scrambling out of VP complements or embedded clauses is not due to the unbounded dependency mechanism such as SLASH feature percolation in GPSG and HPSG, or A-bar movement in GB, but rather to argument attraction. The organization of this section is as follows. In sections 4.4.1 and 4.4.2, we will show how scrambling in VP- and S-complement constructions is appropriately handled through the mechanisms of argument attraction and lexical rules. Here we also propose some LP constraints and an interpretive principle to account for some restrictions on scrambling possibilities. In section 4.4.3, we will discuss the afterthought expression construction and adjunct scrambling, which seem to be directly relevant to the discussions in sections 4.4.1 and 4.4.2.

4.4.1. Word Order Variations in VP-Complement Constructions

4.4.1.1. Control Verb and Dative *Ha*-Causative Constructions

Following Pollard and Sag (1994), Yoo (1993) assumes that VP complement constructions in Korean have a flat structure. For example, (64b) is a structure of a control verb construction which is licensed by the lexical entry in (64c), represented as V[4]. (See (13) in section 4.2.1 for the lexical structure of the control verb.)

(64) a. Mary-ka   John-hanthey [VP   ku chayk-ul   ilkulako] seltukhayssta.
       M-Nom   J-to   the book-Acc   read   persuaded

'Mary persuaded John to read the book.'

b.
```
                         S
         _____
NP::[1]    NP::[2]    VP[SUBJ <NP::[2]>]    V[4]
   |          |       _____        |
Mary-ka   John-hantey ku chayk-ul ilkulako seltukhayssta
```

c.
```
     +-  +-  +-
V[4]|CAT|VAL|SUBJ <NP[str]::[1]>                        -+-+-+
    |   |   |COMPS <NP[dat]::[2], VP[SUBJ <NP[str]::[2]>]:[3]>| |
    |   +-  +-                                            -+-+
    |       +-              -+
    |CONTENT|RELN persuaded|
    |       |PERSUADER [1] |
    |       |PERSUADEE [2] |
    |       |SOA-ARG [3]   |
    +-      +-            -+                                -+
```
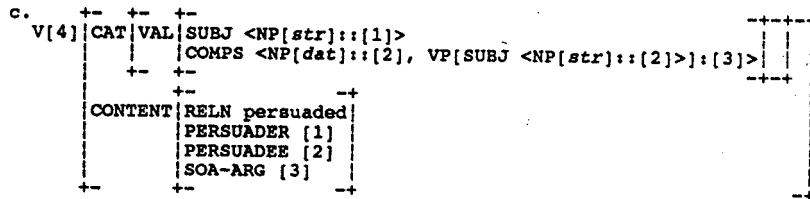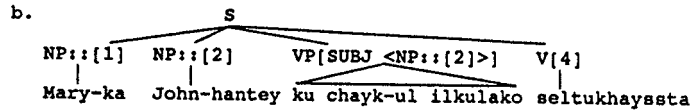
The flat structure in (64b) can account for scrambling among the NP::[1], NP::[2] and VP. However, it cannot account for the fact that the direct object *ku chayk-ul* 'the book' which is governed by the embedded verb *ilkulako* 'read', can be scrambled with arguments governed by the main verb *seltukhayessta* 'persuaded'. Examples are given in (65):

(65) a. Ku chayk-ul   Mary-ka   John-hanthey   ilkulako   seltukhayssta.
        the book-Acc   M-Nom   J-to   read   persuaded

'Mary persuaded John to read the book.'

b. Mary-ka   ku chayk-ul   John-hanthey   ilkulako   seltukhayssta.
   M-Nom   the book-Acc   J-to   read   persuaded

c. Ku chayk-ul   John-hanthey   Mary-ka   ilkulako   seltukhayssta.
   the book-Acc   J-to   M-Nom   read   persuaded

d. Ku chayk-ul   John-hanthey   ilkulako   Mary-ka   seltukhayssta.
   the book-Acc   J-to   read   M-Nom   persuaded

e. * Mary-ka   John-hanthey   ilkulako   ku chayk-ul   seltukhayssta.
     M-Nom   J-to   read   the book-Acc   persuaded

To account for these facts, we propose that a control verb like *seltukhayesta* 'persuaded' can take as its complement not only the VP but also the embedded verb *ilkulako* 'read'. When the control verb takes a verb as its complement, the complement(s) of the complement verb is (are) attracted to the COMPS list of the control verb, as in the AUX constructions. Also we propose that a control verb that takes a VP as its complement is related to the other control verb that takes a V as its complement by a lexical rule in (66).

(66)
```
    +-  +-  +-
   |CAT|VAL|SUBJ <NP[str]::[1]>                        -+-+-+
   |   |   |COMPS <NP::[3], VP[SUBJ <NP[str]::[3]>]:[4]>| | |
   |   +-  +-                                           -+-+
   |       +-              -+
   |CONTENT[5]|RELN x      |
   |          |ARG1 [1]    |
   |          |ARG2 [3]    |
   |          |SOA-ARG [4] |
   +-         +-          -+                              -+
```
                        ↓
```
    +-  +-  +-
   |CAT|VAL| SUBJ <NP[str]::[1]>                       -+-+-+
   |   |   | COMPS <NP::[3],   V[SUBJ<NP[str]::[3]>]:[4]> ⊙ [6]| | |
   |   +-  +-             [COMPS [6]                      -+-+|
   |                                                        -+-+
   |CONTENT [5]
   +-
```

(Here $<X_0,\ldots,X_i> \odot <X_j,\ldots,X_n>$ is $<X_0,\ldots,X_n>$)
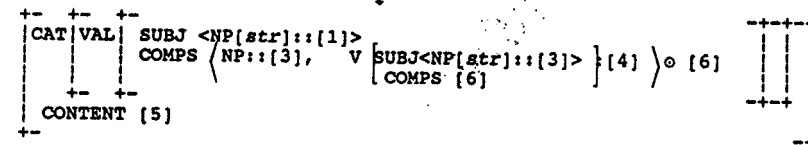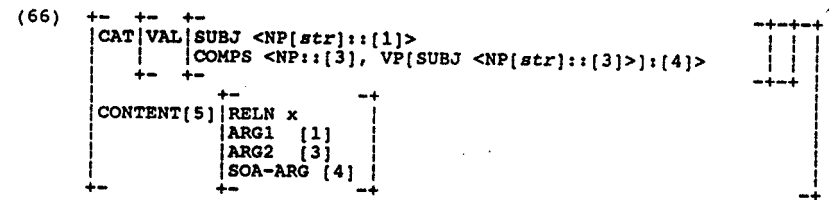
The lexical rule in (66) is formulated in such a way that takes as input a lexical entry which takes as its complements a VP and the controller NP::[3], and gives as output a lexical entry which takes the controller, a verb and the verb's complement(s), i.e., in the

output lexical entry, the COMPS list of the complement verb, which is represented by [6], is attracted to the COMPS list of the control verb.

On our approach, the sentence in (64a) also can be analyzed as in (67a), which is licensed by the lexical entry of the control verb in (67b). (67b) is an instance of the output entry of the lexical rule in (66).

(67)   a.

b.
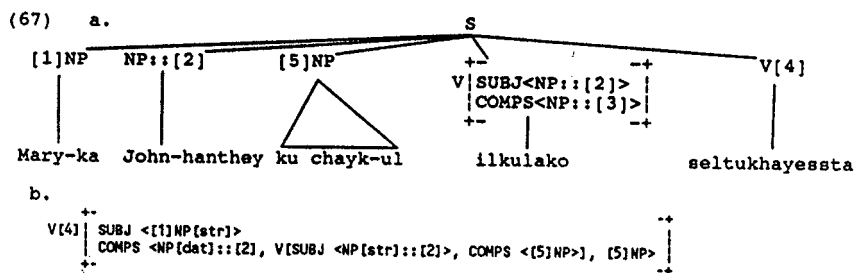
Then, the scrambling fact in (65) is accounted for by the flat analysis illustrated in structure (67a).

The lexical rule in (66) is formulated such a way that it accounts for scrambling involving only object-control constructions, but not subject-control constructions. However, the subject-control construction also allows the same type of scrambling as the object-control construction. Some examples are illustated in (68) and (69):

(68)   a.   Mary-ka   John-hanthey   [VP   ku chayk-ul   pilyecwu-kessako]
            M-Nom   J-to   the book-Acc   lend-will
            yaksokhayssta.
            promised

       'Mary promised John to lend the book.'

       b.   Mary-ka   ku chayk-ul   John-hanthey   pilyecwu-kessako
            M-Nom   the book-Acc   J-to   lend-will
            yaksokhayssta.
            promised

       c.   Ku chayk-ul   John-hanthey   pilyecwu-kessako   Mary-ka
            the book-Acc   J-to   lend-will   M-Nom
            yaksokhayssta.
            promised

(69)   a.   Mary-ka   [VP ku chayk-ul   ilkulyeko]   sitohayssta.
            M-Nom   the book-Acc read   tried

       'Mary tried to read the book.'

       b.   Ku chayk-ul   Mary-ka   ilkulyeko   sitohayssta.
            the book-Acc   M-Nom   read   tried

       c.   Ku chayk-ul   ilkulyeko   Mary-ka   sitohayssta.
            the book-Acc   read   M-Nom   tried

We schematize the lexical rule in (66) into (70) to incorporate the subject-control cases:

(70)
```
+- +- +-                                                        -+-+-+
|CAT|VAL|SUBJ <NP[str]::[1]>                                     | | |
|   |   |COMPS [2]<(NP::[3])>o<VP[SUBJ <NP[str]::[α]>]:[4]> | |
|   +- +-                                                       -+-+ |
|                                                                    |
|   +-             -+                                                |
|CONTENT[5]| RELN x    |                                             |
|          | ARG1  [1] |                                            |
|          |(ARG2  [3])|                                            |
|          | SOA-ARG [4]|                                           |
+-         +-          -+                                          -+
```

$$\downarrow$$

```
+- +- +-                                                     -+-+-+
|CAT|VAL| SUBJ <NP[str]::[1]>                                 | | |
|   |   | COMPS [2]o/ V[SUBJ<NP[str]::[α]]| :[4]\o[6]      | | |
|   |   |          \   [ COMPS [6]       ]        /          -+-+ |
|   +- +-                                                         |
| CONTENT [5]                                                     |
+-                                                              -+
```

(Here $<x_0,...,x_i> \circ <x_j,...,x_n>$ is $<x_0,...,x_n>$, and α = 1 or 3.)

(70) differs from (66) in two respects: (i) (70) states that the verb optionally selects the NP complement, which is indicated by the parentheses ([2]NP::[3]), and that when the NP is not selected, it has no contribution to the semantic content; and (ii) the understood subject of the VP complement is coindexed with either the subject or the complement of the control verb. Then lexical entries such as *yaksokhata* 'promise' and *sitohata* 'try' in (71) feed the lexical rule in (70) producing entries which license flat structures.

(71) a.
```
+- +- +-                                                  -+-+-+
|CAT|VAL|SUBJ <NP[str]::[1]>                               | | |
|   |   |COMPS <NP[dat]::[2], VP[SUBJ <NP[str]::[1]>]:[3]>| |
|   +- +-                                                 -+-+ |
|   +-             -+                                          |
|CONTENT|RELN promise |                                       |
|       |PROMISER [1] |                                       |
|       |PROMISEE [2] |                                       |
|       |SOA-ARG [3]  |                                       |
+-      +-           -+                                      -+
```

b.
```
+- +- +-                                              -+-+-+
|CAT|VAL|SUBJ <NP[str]::[1]>                           | | |
|   |   |COMPS <VP[SUBJ <NP[str]::[1]>]:[2]>|         | |
|   +- +-                                             -+-+ |
|   +-             -+                                      |
|CONTENT|RELN try   |                                     |
|       |TRIER [1]  |                                     |
|       |SOA-ARG [2] |                                    |
+-      +-          -+                                   -+
```

The control verb construction differs from the AUX constructions which are discussed in chapter 3, in that the control verb construction allows syntactic material to intervene between the governed verb and the control verb, while such an intervention is not allowed in the AUX construction as shown in chapter 3, some of which are repeated below:

(72) a. Mary-ka sakwa-lul mekko issta.
         M-Nom   apple-Acc eat   be in the process of

      . 'Mary is eating an apple.'

      b. i. *Mary-ka   mekko   sakwa-lul issta.
            M-Nom   eat   apple-Acc be in the process of

      c. afterthoughts

         iv. *Mary-ka sakwa-lul issta.   mekko
             M-Nom   apple-Acc be in the process of   eat

      d. parentheticals

         iv. *Mary-ka sakwa-lul mekko hayekan issta.
             M-Nom   apple-Acc eat   anyway   be in the process of

This difference is represented in the structure. Thus, in the AUX construction, the governed verb and the AUX form a complex word, as shown in chapter 3. A simplified

version of the structure is repeated below:

(73) a. Mary-ka   ku chayk-ul ilke   poko   issta.
M-Nom   the book-Acc read   try   be in the process of
'Mary is in the process of trying reading the book.'

b.
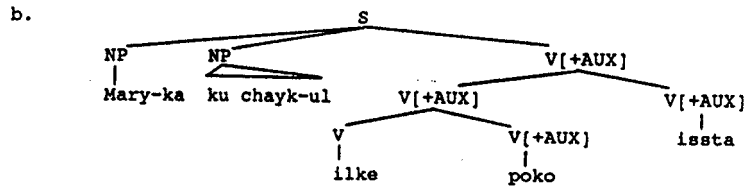
In the control verb construction, in contrast, the governed verb and the control verb are separate syntactic words, as shown in (67) above, and thus syntactical material can intervene the control verb and its complement verb as shown in (65d), (68c) and (69c) for example.

As shown in (65e), however, a complement of a complement verb in the control construction cannot occur between the control verb and its complement verb. On our approach, this ill-formed sentence can be eliminated by assuming the following LP constraint:

(74)   SYNSEM[1] < [COMPS <...[1]...>]

(74) states that a complement must precedes the category which subcategorizes for it, which is an embodiment of the head-final property of Korean. For example, in (65e), *ku chayk* 'the book' is a complement of *ilkulako* 'read', and thus cannot occur after the verb

due to (74).[14]

The only case where a complement can linearly follow a category that subcategorizes for it is in the afterthought expression construction, as shown in (75):

(75)   Mary-ka John-hanthey ilkulako   seltukhayssta, ku chayk-ul.
M-Nom J-to   read   persuaded   the book-Acc
'Mary persuaded John to read the book.'

On our approach, the afterthought expression is treated differently from scrambling. We will discuss this in section 4.4.3.1.

Another matter that we need to discuss in this section is the constraint on scrambling possibilities due to case marking, which is discussed in section 4.3. In the control verb and *ha*-causative constructions, an accusative NP argument or a dative NP argument of an embedded verb cannot scramble with the controller when they have the same marker, as shown in (49)-(51). Sentences (b) there are repeated below:

---

[14]In our theory, the LP constraint is given as a primitive, instead of being derived form other principles. In a theory like GB, the same effect is obtained by the proper binding condition in (i):

(i)   An anaphor (including trace) must be properly bound (i.e., coindexed and c-commanded) by its antecedent (including moved phrases).
(Riemsdijk and Williams (1986))

Scrambling the object within the VP to the left and then scrambling the remnant of the VP to the left over the object produces a proper binding violation.

as in (29) repeated below:

```
(29)
+-  +-  +-
|CAT|VAL|SUBJ <[1]NP[str]::[2]>                                    -+-+-+
|   |   |COMPS <[3]NP[str]::[4], VP[SUBJ <[3]NP[str]::[4]>:[5]>|  | |
|   +-  +-                                                        -+-+ |
|       +-                -+                                           |
|CONTENT|RELN believe|                                                |
|       |BELIEVER [2]|                                                |
|       |SOA-ARG [5] |                                                |
+-      +-           -+                                           -+
```

The lack of scrambling out of the VP complement in this construction, shown in (33a) follows from the fact that a raising verb does not feed the lexical rule in (70). In the input entry of the lexical rule, the controller has its own semantic role. As shown in (29), however, the controller in the raising verb, represented by [3]NP[*str*], does not have its own semantic role (no role of BELIEVEE in (29)). Thus (29) is not a licit lexical entry for the input, and the lexical rule in (70) does not allow it to have the output counterpart. Under this assumption, the structure of the raising verb sentence in (30a), repeated in (77a), is analyzed only as in (77b):

(77) a. Mary-ka   John-ul   [VP   New York-ey   isstako]   mitnunta.
          M-Nom   J-Acc   New York-at   exist   believe
          'Mary believes John to be/stay at New York.'

b.
```
                            S
          _____/ | _____
       [1]NP      [3]NP      VP[SUBJ<[3]NP>]         V
        |          |         _____       |
      Mary-ka    John-ul     New York-ey isstako    mitnunta
```
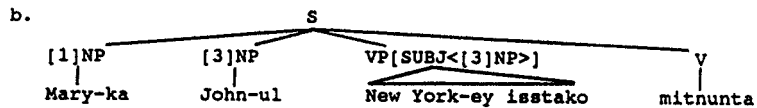
Here *New York-ey* cannot scramble out of the VP complement since it is confined within the VP.[16]

To account for the fact that the controller cannot occur after the complement VP in the raising verb construction, we assume the following LP constraint, which is suggested by Yoo (1992):

(78)   SYNSEM[1] < [SUBJ <[1]>]

(78) states that a subject must precede the category which selects it as a subject. Like the LP constraint in (74), the LP constraint in (78) is another embodiment of the head-final property of Korean. In (30e), repeated above, *John-ul* is the subject of the VP *New York-ey isstako* 'to stay at New York', but does not precede the VP. Thus, (30e) is unacceptable due to the violation of (77).[17]

It is important to note that the LP constraint in (78) does not apply in the case of the control verb construction. (78) applies only when the whole SYNSEM value of the controller and the subject of the VP complement is the same. As shown in (64c), (67b) or (71), however, the controller and the understood subject of the verbal complement of

---

[16]Even though our theory can capture the different scrambling possibilities between control and raising verb constructions by restricting the application of the attraction rule to the control construction, it does not explain why it must be the case. If the difference is caused by an independent reason, we may generalize the lexical rule so that it can apply to all lexical entries which take any kind of verbal expression as its complement. We leave this for further study.

[17]The LP constraints encoding head-finality (e.g., (74) and (78)) can be schematized as in (i), where VAL ranges over all valence features.

(i)   SYNSEM[1] < [VAL|... <...[1]...>]

the control verb are just coindexed, and the whole SYNSEM value is not necessarily the same. Hence, in the control verb construction, (78) does not apply, and the controller is allowed to linearly follow the verbal complement.[18]

The subject of the raising verb can occur between the complement VP and the raising verb as shown in (30c), repeated below:

(30) c. John-ul   [VP New York-ey   isstako]   Mary-ka   mitnunta.
         J-Acc   New York-at   stay   M-Nom   believe
         'Mary believes John to be/stay at New York.'

This is predicted by the flat analysis shown in (77b).

4.4.1.3. Accusative *Ha*-Causative Construction

As discussed in section 4.1.4 and summarized in the table in (45), the scrambling possibilities of the accusative *ha*-causative construction are not the same as those of the control verb construction or of the raising verb construction. On the one hand, this *ha* verb has the property of a raising verb that it does not allow the controller to occur after

---

[18]We may think that the proper binding condition is also responsible for the fact that the controller linearly follows the complement VP (e.g., (30d,e)) in the raising verb construction, under the assumption that the controller is within the VP complement at D-structure. That is, scrambling the controller within the VP to the left and then scrambling the remnant of the VP to left over the controller produces a proper binding violation. However, this account is problematic because it needs to assume that the controller within the VP complement is allowed to be scrambled out of the VP first. As shown in (33a), however, an argument within the VP is generally not allowed to be scrambled out of the VP, and thus the preassumption is not tenable.

the governed verb (e.g., (42), repeated below), but on the other hand, it also has the property of a control verb that an argument within the VP complement can scramble with arguments outside the VP or can be an afterthought expression (e.g., (43), repeated below).

(42) * Mary-ka   [VP ku chayk-ul   ilkkey]   John-ul   hayssta.
          M-Nom   the book-Acc read   J-Acc   caused
          'Mary caused John to read the book.'

(43) a. Mary-ka   cip-ulo   John-ul   tolakakey hayssta.
          M-Nom   home-to   J-Acc   go back   caused

          'Mary caused John to go back home.'

      b. Mary-ka   John-ul   tolakakey hayssta,   cip-ulo.
          M-Nom   J-Acc   go back   caused   home-to

Also note that the accusative *ha*-causative differs from both the control and raising verbs in that it does not allow the complement VP to be an afterthought expression (e.g., (44), repeated below).

(44) * Mary-ka   John-ul   hayssta,   [VP cip-ulo   tolakakey].
          M-Nom   J-Acc   caused   home-to   go back
          'Mary caused John to go back home.'

On our approach, all the properties of the accusative *ha*-causative fall out naturally if we assume that the *ha* verb has the lexical entry in (79), which is a revision of (39b):

(79)
```
    +-  +-  +-
    |CAT|VAL| SUBJ <NP[str]::[1]>                        -+-+-+
    |   |   | COMPS/[3], V SUBJ<[3]NP[str]::[2]> :[4]\:[4]) o [5]| | |
    |   |   |      \      COMPS [5]            /         -+-+ | |
    |   +-  +-           -+                                    | |
    |CONTENT|RELN cause |                                      | |
    |       |CAUSER [2]  |                                     | |
    |       |SOA-ARG [4] |                                     | |
    +-      +-          -+                                    -+
```
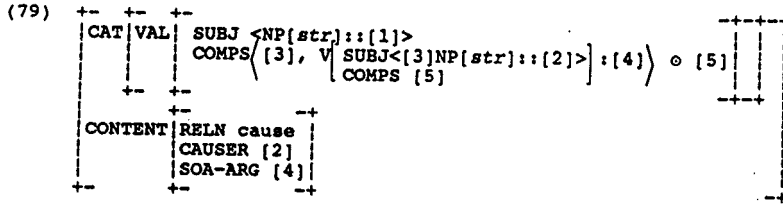
This resembles an output of the lexical entry in (70); on our account, however, there is no lexical entry corresponding to an input for (70), and therefore (79) must simply be listed separately. The lexical entry in (79) licenses the structure in (80b) for the sentence in (38b), repeated as (80a) below:

(80) a. Mary-ka John-ul ku chayk-ul ilkkey hayssta.
        M-Nom   J-Acc   the book-Acc read   caused
        'Mary caused John to read the book.'

b.
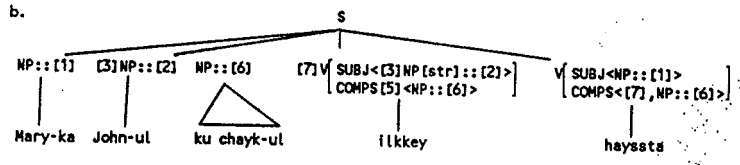
In (80b), *John-ul* and the subject of the verb *ilkkey* 'read' have the same SYNSEM value, which is represented as [3]NP[*str*]. Thus, by the LP constraint in (78), *John-ul* must precede *ilkkey*. (42) is unacceptable since it violates (78). Here *ku chayk-ul* 'the book' cannot follow *ilkkey*, because of the LP constraint in (74) which states that a complement must precede the category which subcategorizes for it. Our analysis correctly predicts that all permutations of three NPs and a complement verb in (80b) are possible as long as

these two LP constraints are observed.

The fact that *ku chayk-ul ilkkey* 'to read the book' cannot be an afterthought expression as shown in (44), repeated above, is also naturally accounted for by the analysis in (80b) where *ku chayk-ul* and *ilkkey* do not form a constituent. On our analysis, the only way to form a sentence like (44) is to assume that the lexical category *ilkkey* itself is used independently as an afterthought expression. However, this assumption violates the constraint that only a phrasal category can be an afterthought expression. (See section 4.1.1 for the discussion about this constraint.) (44) is unacceptable due to a violation of this constraint. See section 4.4.3 for detailed discussion of the afterthought construction.

4.4.2. Word Order Variations in S-Complement Constructions

We extend the idea of scrambling via argument attraction further, proposing that scrambling out of an S-complement also can be accounted for by argument attraction. Relevant examples are (46) and (47), which are repeated below:

(46) a. Nay-ka   [s Mary-ka ku chayk-ul ilkesstako] sayngkakhayssta.
        I-Nom   M-Nom   the book-Acc read   thought

        'I thought Mary read the book.'

     b. Ku chayk-ul nay-ka Mary-ka ilkesstako sayngkakhayssta.
        the book-Acc I-Nom   M-Nom   read   thought

(47) a. Mary-ka   motwun salam-hanthey   [s   John-i ku mwuncey-lul
          M-Nom   all people-to   J-Nom   the problem-Acc
          haykyelhaysstako]   malhayssta.
          resolved   told

          'Mary told all the people that John resolved the problem.'

      b. (?) Ku mwuncey-lul,   Mary-ka,   motwun salam-hanthey, John-i
             the problem-Acc   M-Nom   all people-to   J-Nom
          haykyelhaysstako malhayssta.
          resolved   told

      c. ? Mary-ka, ku mwuncey-lul, motwun salam-hanthey, John-i
             M-Nom   the problem-Acc all people-to   J-Nom
          haykyelhaysstako malhayssta.
          resolved   told

In our analysis, arguments of the head of the embedded clause can be attracted to the COMPS lists of the matrix verb. To this end, we posit the following lexical rule which is similar to that in (70):

(81)

```
+-  +-                                 -+ -+
|CAT|SUBJ [1]<NP[str]::[2]>             |  |
|   |COMPS [4]<(NP[dat])>o<S:[5]>       |  |
|   +-                                  -+ |
|          +-               -+             |
|CONTENT[6]|RELN  x          |             |
|          |ARG1 [2]         |             |
|          |     .           |             |
|          |     .           |             |
|          |SOA-ARG [5]|                   |
+-         +-          -+          -+      |
                                    -+
```

                              ↓

```
+-  +-                                                    -+-+
|CAT|SUBJ [1]                                              | |
|   |        +-                 -+                         | |
|   |COMPS [4]o/V|SUBJ<NP[str]::[9]>|:[5]\o<NP[nom]::[9]>o[8]| |
|   |        \  |COMPS [8]           /                     | |
|   +-       +-                 -+                         -+ |
|CONTENT [6]                                                  |
+-                                                          -+
```

The input entry of (81) takes a sentence as its complement. When the element represented by [4] is an empty list, the input entry stands for a lexical entry that takes only a sentence as its complement (e.g., *sayngkakhayssta* 'thought' in (46), repeated above). When [4] is realized as an NP[*dat*], the input entry stands for a lexical entry that takes both an NP[*dat*] and an S as its complement (e.g., *malhayssta* 'told' in (47), repeated above). In contrast, the output entry of (81) takes a verb as its complement in addition to [4], and the subject and complement of the complement verb (represented by NP[str]::[9] and [8]) are attracted and appended to the COMPS lists of the matrix verb. Note that when the subject NP of the embedded verb is attracted to the COMPS list, nominative case is lexically assigned to it, so that accusative case cannot be assigned to the attracted embedded subject through the Case Principle. See section 5.1 and 5.4.1 in chapter 5 for the motivation that we assume the embedded subject to be attracted to the matrix verbs's COMPS list, rather than to the SUBJ list.

On our approach, the scrambling shown in (46b) and (47b,c) above is licensed by output entries of the lexical rule. (82a) is a structure of (46b) licensed by (82b), and (83a) is a structure of (47b,c) licensed by (83b):[19]

_____

[19]In (82b) and (83b), NP's case is not specified when assigned case is *str(uctural)* just for expository convenience.

(82) a.

```
                                    S
        NP::[1]      NP::[2]     NP::[3]        [4]V            [5]V
           |            |           |             |               |
        na-nun      Mary-ka    ku chayk-ul   ilkesstako    sayngkakhayssta
```

b.
```
      +-    +-    +-                                        -+-+-+
[5]V|CAT|VAL|SUBJ <NP::[1]>                                |||
    |   |   |COMPS  /[4]V SUBJ <NP::[2]>           \       |||
    |   |   |      (      COMPS <NP::[3]>  , NP[nom]::[2], NP::[3]/  |||
    |   +-  |                                                    -+-+
    |       +-                            -+
    |CONTENT|RELN thought
    |       |THINKER [1]
    |       |                   +-        -+
    |       |SOA-ARG|RELN read |
    |       |       |READER [2]|
    |       |       |READ  [3] |
    +-      +-      +-         -+ -+                         -+
```

(83) a.
```
                                 S
   NP::[1]  NP::[2]        NP[nom]::[3]    NP::[4]      [5]V         [6]V
      |        |               |             |           |            |
   na-nun    motun          John-i     ku mwuncey-lul  haykyel-    malhayssta
          salam-hanthey                                haysstako
```

b.
```
   +-   +-   +-                                          -+-+-+
[6]V|CAT|VAL|SUBJ <NP::[1]>                             |||
    |   |   |COMPS  /                 [5]V SUBJ <NP::[3]>     \  |||
    |   |   |      ( NP[dat]::[2],       COMPS <NP::[4]> , NP[nom]::[3], NP::[4]/ |||
    |   +-  +-                                                        -+-+
    |       +-                            -+
    |CONTENT|RELN told
    |       |TELLER [1]
    |       |TELLEE [2]
    |       |                +-         -+
    |       |SOA-ARG|RELN resolved|
    |       |       |RESOLVER [3]|
    |       |       |RESOLVED [4]|
    +-      +-      +-          -+-+-+                               -+
```

In the examples discussed so far, only one argument is scrambled out of the embedded clause. But rule (81) allows arbitrarily many arguments of the embedded clause to scramble out. Actually this is possible in Korean as shown below:

(84) a. Nay-ka   [s Mary-ka   ku chayk-ul   John-hanthey pilyecwuesstako]
          I-Nom   M-Nom   the book-Acc J-to   lent
          malhayssta.
          told
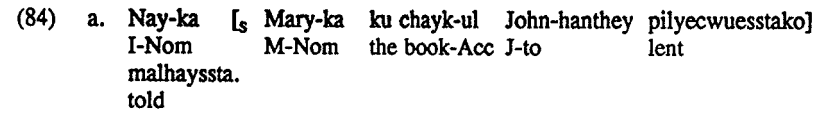
      'I told that Mary lent the book to John.'

      b. Ku chayk-ul   John-hanthey nay-ka   Mary-ka   pilyecwuesstako
          the book-Acc   J-to   I-Nom   M-Nom   lent
          malhayssta.
          told

      c. John-hanthey   ku chayk-ul   nay-ka   Mary-ka   pilyecwuesstako
          J-to   the book-Acc I-Nom   M-Nom   lent
          malhayssta.
          told
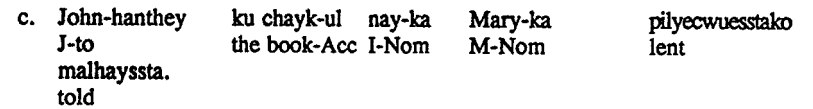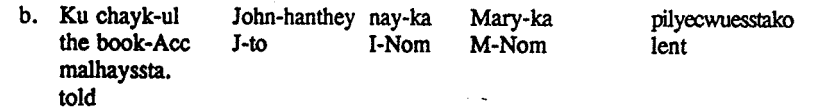
The flat structure analyses in (82a) and (83a) alone cannot account for the fact that a nominative subject of the complement verb cannot scramble with arguments of the main verb, which was discussed in section 4.3 through the examples in (53) and (54). The examples are repeated below:
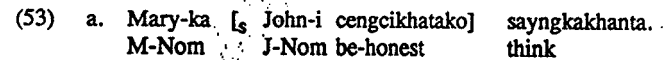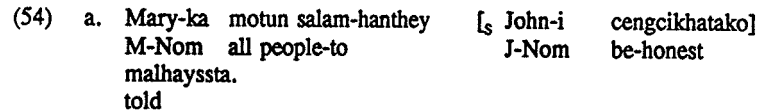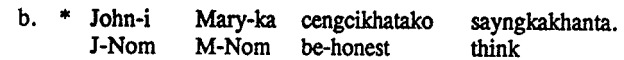
(53) a. Mary-ka [s John-i cengcikhatako]   sayngkakhanta.
          M-Nom   J-Nom be-honest   think

      'Mary thinks John is honest.'

      b. * John-i   Mary-ka   cengcikhatako   sayngkakhanta.
            J-Nom   M-Nom   be-honest   think

(54) a. Mary-ka   motun salam-hanthey   [s John-i   cengcikhatako]
          M-Nom   all people-to   J-Nom   be-honest
          malhayssta.
          told

      'Mary told all people that John was honest.'

b. * Mary-ka   John-i   motun salam-hanthey   cengcikhatako malhayssta.
   M-Nom   J-Nom   all people-to   be-honest   told

c. * John-i   Mary-ka motun salam-hanthey   cengcikhatako malhayssta.
   J-Nom   M-Nom   all people-to   be-honest   told

In section 4.3, we pointed out that Saito's (1985) condition that prevents a subject from being scrambled under any circumstance is too strong and cannot fully account for data such as (56b), (57b) and (58b), repeated below:

(56) b. Nwu-ka   ne-nun   olilako   sayngkakkha-ni?
    who-Nom you-Top will come   think
    'Who do you think will come?'

(57) b. Ku kkoch-i Mary-nun   situlesstako sayngkakhanta.
    M-Top   the flower-Nom wither   think
    'Mary thinks the flower withers.'

(58) b. Ku chayk-ul   ilkessta,   Mary-ka.
    the book-Acc   read   M-Nom
    'Mary read the book.'

Presently, we do not know the exact reason why the nominative NP of the embedded verb generally cannot scramble with arguments of the matrix verb, but the descriptive generalization involved here is as follows: a nominative NP and the linearly closest verb form an interpretive unit, a clause. In other words, speakers interpret as components of one clause all the constituents that appear between a nominative NP and the closest verb. If we assume the above generalization to be correct one, (53b) is unacceptable because *Mary-ka cengcikhatako* 'Mary is honest' is interpreted as an

embedded clause, and the intended interpretation cannot be obtained. (53b,c) are unacceptable because *John-i motun salam-hanthey cengcikhatako* 'John is honest to all people' is interpreted as a clause and thus the intended interpretation cannot be obtained.

If this kind of interpretive principle is responsible for the unacceptability of (53b) and (54b,c), then how can we account for the acceptability of the sentences in (56b) and (57b), which were repeated above? In (56b) and (57b), the NPs with *-nun* marker are an argument of the matrix verb but occur between the embedded subject and the embedded verb. Thus, the interpretive principle discussed above incorrectly rules them out. Even though it is far from clear why they are exceptions to the principle, there seems to be an explanation for this fact. As suggested by the name of the principle, the principle is an interpretive or processing principle, which can be overridden by certain grammatical clues. That is, (56b) and (57b) may not be ruled out by the principle due to certain grammatical clues, which are discussed below.

In Korean, the marker *-nun* has two different functions. One is the topic marker, and the other is the contrastive focus marker. Even though they have the same phonetic shape, they seem to have different stress patterns. When *-nun* is used as the topic marker, it usually does not bear stress or high pitch accent, while when it is used as the contrastive focus marker, it usually bears stress (Choe (1994)). Another crucial difference arises from their syntactic distribution. In Korean and Japanese, the topic marker and the subject marker (the nominative marker *-ka/-i*) are quite interchangeable in their usage, so that native speakers usually consider *-nun* as another subject marker. Gunji (1986) also says that both topic and subject in Japanese have similar properties except that the topic

is used to introduce old information, whereas the subject is used to introduce new information. However, when a sentence contains an embedded clause, this interchangeability disappears. That is, when the embedded subject has the *-nun* marker, it always has the contrastive focus reading, but not the ordinary subject or topic reading.

Based on these observations, let us reconsider the sentences in (56b) and (57b). In (56b) for example, we can assume that the marker *-nun* in *ne-nun* 'you' does not carry focal stress so that *ne-nun* is interpreted as having not the contrastive reading but the ordinary subject or topic reading, as shown in the English translation. Then *ne-nun* cannot be interpreted as the embedded subject since the embedded subject with the marker *-nun* always has the contrastive focus reading. Therefore, in this case, there is no other choice but interpreting *ne-nun* as the matrix subject. The same reasoning is possible for (57b). In (57b), this kind of syntactic and phonological clues are facilitated further by a pragmatic clue, i.e., flowers wither but not people. If the marker *-nun* has focal stress, then *ne-nun* is interpreted as an embedded subject with a contrastive focus reading. In this case, the interpretation of (56b) is roughly as follows: 'who thinks that you will come (but does not know about the others)?'.

The processing or interpretive condition discussed above can be described as follows:

(85)   Interpretive Principle

Suppose (i) that Y is an NP[*nom*], (ii) that X is the first verb to the right of Y, and (iii) that Z is any non-topic constituent which occurs between Y and X. Then Z cannot be a semantic dependent of a verb superordinate to X.

The principle in (85) can be rephrased with the notion of cross dependency which is widely used in study of language processing as follows: an NP[*nom*] Y and the verb X which selects Y cannot be in a cross dependency relation with an intervention of a constituent Z which is a non-topic dependent (adjunct or argument) of a verb which linearly follows X. Here, we mean by a cross dependency relation the following structural description for example:

```
(86)
[...NP[nom]::[1]...NP::[2]...V[3][CONTENT|ARG[1]]...V[4][CONTENT|ARG[2]..]
       |_____|    |_____|         |
                     |_____|
```

In (86), NP[*nom*]::[1] and V[3] are in a cross dependency relation because NP::[2] which is an argument of V[4] intervenes between NP[*nom*]::[1] and V[3]. Hence, according to (85), (86) is an unacceptable structural description.

(53b) and (54b) above have the same type of structural descriptions as (86), as illustrated in (87a) and (87b), respectively. And thus they are all unacceptable.

```
(87) a. [NP[nom]::[1]  NP[nom]::[2]  V[CONTENT|ARG[1]]  V[CONTENT|ARG[2]]
           |_____|    |_____|
                         |_____|
```

b. `[NP[nom]::[1] NP[nom]::[2] NP::[3] V[CONTENT|ARG[2]] V[CONTENT|ARG[3]]`

The interpretive principle in (85) also correctly accounts for the acceptability of afterthought expressions in (88b,c):

(88)　a.　Mary-ka　John-i　　cengcikhatako　　sayngkakhanta.
　　　　　M-Nom　J-Nom　　be-honest　　　　think

　　　　　'Mary thinks John is honest.'

　　　b.　John-i　　cengcikhatako　sayngkakhanta,　Mary-ka.
　　　　　J-Nom　　be-honest　　　think　　　　　　M-Nom

　　　c.　*　Mary-ka　cengcikhatako　sayngkakhanta,　John-i.
　　　　　　　M-Nom　be-honest　　　think　　　　　　J-Nom

(88c) cannot be interpreted as the intended meaning 'Mary thinks John is honest'. Rather, it is interpreted as 'John thinks Mary is honest'. The structural description of (88c) with the intended meaning is as follows, in violation of (85):

(89) `[NP[nom]::[1]　V[CONTENT|ARG[2]]　V[CONTENT|ARG[1]]　NP[nom]::[2]]`

However, if we interpret it as 'John thinks Mary is honest', the structural description is as in (90):

(90) `[NP[nom]::[1]　V[CONTENT|ARG[1]]　V[CONTENT|ARG[2]]　NP[nom]::[2]]`

This is consistent with (85), and the sentence is acceptable with this interpretation. See section 4.4.4.2 for the case where the principle in (85) is applied to the interpretation of an adjunct.

So far we have discussed only scrambling among arguments and their predicates that occur linearly before a matrix verb. In the following section, we will explore two other phenomena which are relevant to the previous discussion on scrambling: the afterthought construction and adjunct scrambling.

4.4.3. Two Relevant Phenomena

4.4.3.1. Afterthought Expression Construction

As discussed in section 4.3, afterthought expressions are subject to syntactic constraints, i.e., an afterthought expression is not allowed out of an adjunct or a sentential subject, as scrambling is not allowed out of those constituents. The examples are repeated below:

(59)　a.　Mary-ka　[NP [S ku yenghwa-lul　an　　pon]　salam-ul]
　　　　　M-Nom　　　　the movie-Acc　not　　see　　person-Acc
　　　　　mannaci　moshayssta.
　　　　　meet　　　did not

　　　　　'Mary did not meet any person who did not see the movie.'

b. afterthought

* Mary-ka [NP [S ___ an pon] salam-ul] mannaci
M-Nom not see person-Acc meet
moshayssta, ku yenghwa-lul.
did not the movie-Acc

c. scrambling

* Ku yenghwa-lul Mary-ka [NP [S ___ an pon] salam-ul]
the movie-Acc M-Nom not see person-Acc
mannaci moshayssta.
meet did not

(60) a. Mary-nun [S kicha-ka ku yek-ey imi tochakhaysski
M-Top train-Nom the station-at already arrive
ttaymwuney] pyo-lul howanpwulhayssta.
because ticket-Acc refunded

'Mary refunded a ticket because the train already arrived at the station.'

b. afterthought

* Mary-nun [S kicha-ka ___ imi tochakhaysski ttaymwuney]
M-Top train-Nom already arrive because
pyo-lul howanpwulhayssta, ku yek-ey.
ticket-Acc refunded the station-at

c. scrambling

* Ku yek-ey Mary-nun [S kicha-ka ___ imi tochakhaysski
the station-at M-Top train-Nom already arrive
ttaymwuney] pyo-lul howanpwulhayssta.
because ticket-Acc refunded

(61) a. [S Mary-ka ku yenghwa-lul pon kes]-i motwu-eykey
M-Nom the movie-Acc saw COMP-Nom all-to
palkhieciessta.
become known

'It became known to all (people) that Mary saw the movie.'

b. afterthought

* [S Mary-ka ___ pon kes]-i motwu-eykey palkhieciessta,
M-Nom saw COMP-Nom all-to become known
ku yenghwa-lul.
the movie-Acc

c. scrambling

* Mary-ka motwu-eykey ku yenghwa-lul pon kes-i
M-Nom all-to the movie-Acc saw COMP-Nom
palkhieciessta.
become known

* [S Mary-ka ___ pon kes]-i ku yenghwa-lul motwu-eykey
M-Nom saw COMP-Nom the movie-Acc all-to
palkhieciessta.
become known

Also note that, as summarized in (45), an argument within a VP complement of a raising verb cannot scramble out of the VP or be an afterthought expression. The relevant examples are repeated as follows:

(91) a. Mary-ka John-ul [VP New York-ey isstako] mitnunta.
M-Nom J-Acc New York-at exist believe

'Mary believes John to be/stay at New York.' (=(28a))

b. afterthought

?? Mary-ka John-ul [VP isstako] mitnunta, New York-ey.
M-Nom J-Acc stay believe New York-at (=(30c))

c. scrambling (=(31a))

??/* New York-ey Mary-ka John-ul [VP isstako] mitnunta.
New York-at M-Nom J-Acc exist believe

To capture this parallelism between scrambling and afterthought expressions, we may assume that both are instances of the same syntactic phenomena, i.e., afterthought expressions are special instances of scrambling, being restricted by a special LP constraint. However, this assumption is not tenable since the afterthought construction differs from scrambling in some respects. First of all, the afterthought expression is a root phenomena in the sense that it never occurs within an embedded clause, while scrambling does, as shown in (92):

(92) a. Mary-nun   [s John-i   ku yenghwa-lul   poasstako] sayngkakhayssta.
        M-Top   J-Nom   the movie-Acc   saw   thought

        'Mary thought John saw the movie.'

    b. afterthought

        * Mary-nun   [s John-i   poasstako,   ku yenghwa-lul]
          M-Top   J-Nom   saw   the movie-Acc
          sayngkakhayssta.
          thought

    c. scrambling

        Mary-nun   [s ku yenghwa-lul   John-i   poasstako]
        M-Top   the movie-Acc   J-Nom   saw
        sayngkakhayssta.
        thought

Also a resumptive pronoun is allowed in the afterthought construction (Saito (1985), Whitman (1990) and Yoo (1992)), while it is not allowed in scrambling, as shown in (93):

(93) a. Na-nun   [s Mary-ka   John-ul   cohahantako] sayngkakhayssta.
        I-Top   M-Nom   J-Acc   like   thought

        'I thought Mary liked John.'

    b. afterthought

        (?)   Na-nun   [s Mary-ka   ku$_i$-lul   cohahantako]
             I-Top   M-Nom   he-Acc   like
             sayngkakhayssta,   John$_i$-ul.
             thought   J-Acc

    c. scrambling

        *   John$_i$-ul   na-nun   [s Mary-ka   ku$_i$-lul   cohahantako]
          J-Acc   I-Top   J-Nom   he-Acc   like
          sayngkakhayssta.
          thought

From (93b), we might assume that an afterthought expression is similar to so-called Chinese style topicalization (Kuno (1973) and Xu and Langendoen (1985)) which also allows a resumptive pronoun. As mentioned in section 4.3, however, this assumption is not tenable either because topicalization differs from the afterthought expression in that the topic is generally interpretable as (or coindexable with) the element within an adjunct, as long as the topic and the comment clause satisfy the "aboutness condition" (Kuno (1973)). Thus in the topicalization construction, the topic allows its resumptive pronoun within an adjunct, as shown in (86a), whereas this kind of resumptive pronoun is not allowed in the afterthought construction, as shown in (94b):

(94) a. Ku yenghwa$_i$-nun   Mary-ka   [$_{NP}$ [$_S$ kukes$_i$-ul   an   pon]
      the movie-Top   M-Nom   it-Acc   not   see
      salam-ul]   mannaci   moshayssta.
      person-Acc   meet   did not

      'As for the movie, Mary did not meet any person who did not see it.'

    b. * Mary-ka   [$_{NP}$ [$_S$ kukes$_i$-ul   an   pon]   salam-ul]
       M-Nom   it-Acc   not   see   person-Acc
       mannaci   moshayssta,   ku yenghwa$_i$-nun/-lul.
       meet   did not   the movie-Top/-Acc

From the above observations, we may conclude that it would be hard to account for all the facts mentioned above if we assume that afterthought expressions are just an instance of scrambling or Chinese-style topicalization.

Before we propose our own analysis of the afterthought construction, we will briefly digress to discuss Korean verbal morphology in Kim (1994), which will be crucial in our analysis for the distinction between the head verb of a matrix clause and that of an embedded clause. Kim assumes the sort hierarchy in (95) for verbal sign at the level of morphology, based on the morphological behavior of verbal suffixes. Here only relevant parts are repeated.

(95)

```
                    sign
                   /  \
      ... morph-sign    word  ...
              |        /
          ... stem  /
                 /\
      bound-stem   free stem
          |       /   |    \
   v-bound-stem  v-free-stem  n-free-stem  x-free stem
      / \         /  |   \
 v-hon  v-tense  v-indiv-word  v-comp-word  v-mod-word
```
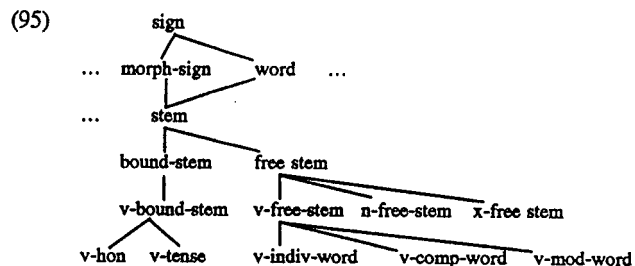
                             (=(55) in Kim (1994))

(95) indicates that sort *word* has a subsort *stem*. *Stem* has a subsort *free stem* which in turn is divided into three subsorts. Among them, *v-free-stem* is subdivided into three subsorts: *v-indiv(1sual)-word* which is the sort for verbs which are completed as a word with a mood suffix, *v-comp(lementizer)-word* for verbs which are completed with a complementizer suffix, and *v-mod(ifying)-word* for verbs which are completed with a prenominal modifier suffix. Sort *free stem* also has two other subsorts, *n-free stem* and *x-free stem*. The former is for verbs with nominalization (nmlz) suffix, and the latter is for objects with a delimiter suffix.[20]

Here, the crucial point for the current discussion is the distribution of the verb of sort *v-indiv-word*. Only a verb of this sort can be the head of a matrix clause, while it cannot be a head of an embedded clause such as complement clause (or VP), subordinate clause (or VP), nominalized clause, or relative clause, as shown in (96):

(96)   complement clause

    a. [$_S$ Nay chinkwu-ka   tolao-ass-nun-ci]   kwungkumha-ta.
       my-friend-Nom   return-past-mod-comp   wonder-mood.decl.

      'I wonder whether my friend has returned.'

    b. * [$_S$ Nay chinkwu-ka tolao-ass-(nun-ci)-ta]   kwungkumha-ta.
       my-friend-Nom   return-past-mod-comp-mood.decl   wonder-mood

---

[20]Some examples of each suffix are as follows:

mood: -*ta* (declarative), -*kka* (question), -*(e)la* (imperative), -*ca* (proposative), etc.
complementizer: -*al-e*, -*ci*, -*key*, -*ko*, -*eya*, -*na*, etc.
modifier: -*(n)un*, -*(u)l*, -*ten*, etc.
nominalizer: -*(u)m*, -*ki*
delimeter: -*man* 'only', -*to* 'also', -*cocha* 'even', etc.

subordinate clause

c. [$_s$ Nay chinkwu-ka   tolao-ca-(ⁿta)]   pathi-ka   yelyessta.
  my friend-Nom   return-immediately.after-mood   party-Nom   was-held
  'A party was held immediately after my friend returned.'

nominalized clause

d. [$_s$ Nay chinkwu-ka   tolao-ass-ki-(ⁿta)   ttaymwuney]
  my friend-Nom   return-past-nmlz-mood   because
  na-nun   kippess-ta.
  I-Top   was-happy-mood
  'I was happy because my friend returned.'

relative clause

e. tolao-n-(ⁿta)   nay chinkwu
  return-mod-mood   may friend
  'my returned friend'

However, there seems to be an exception to the generalization that a verb of only v-indiv-word must be a head of a matrix clause, and that it can never be a head of an embedded clause. The exception is a complement clause (or VP) which generally takes the -ko comp suffix, as shown in (97):

(97) Na-nun   [$_s$ nay chinkwu-ka   tolaoass-ta-⁽ⁿ⁾(ko)]   sayngkakhayss-ta.
  I-Nom   my friend-Nom   returned-mood-comp   thought-mood
  'I thought (that) my friend returned.'

In (97), the sentence without the comp suffix -ko is slightly awkward but quite acceptable. In this case, the verb in the embedded clause looks like a verb of sort v-indiv-word since it is a complete verb that ends with a mood-suffix -ta. We can now account

for the fact that an afterthought expression is allowed only in a matrix clause (the so-called root phenomena) if we can assume that an afterthought expression is allowed only in a clause headed by a verb of v-indiv-word. To this end, we assume another value for the complementizer form, namely -ta. That is, the embedded verb without the complementizer -ko in (97) belongs to verbs of v-comp-word which have -ta as its comp suffix value. The comp suffix form -ta must belong to the COMP3 in Kim's (1994) system which stands for verbs which are completed with a complementizer and whose stem is a verb ending with a certain tense form (the verb of sort v-tense in (95)).

For the interaction between the inflectional verbal morphology and syntax, we propose the following feature declarations:

(98) a. v-indiv-word[HEAD verb[MOOD α]
      α={decl(arative), ques(tion), prop(osative),...}

      (e.g., decl={-ta, -yo, ...}, ques={-kka, -ni,...}, prop={-ca,...},...)

    b. v-comp-word[HEAD verb[COMPα]
      α={1,2,3,4}

      (e.g., COMP1={-e/a}, COMP2={-ci, -key, -ko}, COMP3={-eya, -na, -ta}, COMP4={-ko})

    c. v-mod-word[HEAD verb[MODR α]
      α={rel(ative)-past, rel-fut(ure), rel-pres(ent),...}

      (e.g., rel-past={-n}, rel-fut={-ul}, rel-pres={-nun},...)

    d. n-free-stem[HEAD verb[NMLZ α]
      α={factive, non-factive}

      (e.g., factive={-um}, non-factive={-ki})

In (98), each inflectional information is represented by a Head feature such as MOOD, COMPLEMENTIZER (COMP), MODIFIER (MODR) or NOMINALIZER (NMLZ), following the general treatment of inflections via Head features. On this approach, the analysis of (97) without comp -*ko* is as in (99), where the percolation of features of the verbal morphology is focused on.[21]

(99)
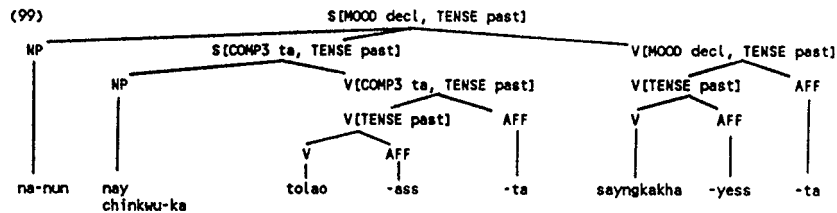
In (99), due to the Head feature principle, the COMP feature, [COMP3 *ta*], of the embedded verb *tolao-ass-ta* 'returned' is percolated up to the S mother node. The matrix verb *sayngkakha-yess-ta* 'thought' can select as its complement a clause whose COMP form is -*ko* or -*ta* (e.g., (97)).

Based on the discussion about verbal morphology in Korean above, we propose the lexical rule in (100) which introduces the SLASH feature for the afterthought construction, an ID schema in (101) for the Head-Filler construction, and an LP constraint in (102) for the linear order of a filler daughter:

---

[21]Following Sells (1995), Kim (1994) assumes that a verbal affix is not a head in a morphology structure and has just a morphophonemic PHON attribute as its value. See Kim (1994) for more precise and detailed accounts of verbal morphology structures.

(100)

$$v\text{-}indiv\text{-}word \begin{bmatrix} \text{LOCAL|CAT|VAL|}...<...\text{XP[LOC [1]]::[2]}...> \\ \text{NONLOCAL|INHER|SLASH [3]} \end{bmatrix}$$

$$\downarrow$$

$$v\text{-}indiv\text{-}word \begin{bmatrix} \text{LOCAL|CAT|VAL|}...<...\text{pro[LOC [1]]::[2]}...> \\ \text{NONLOCAL|INHER|SLASH [3]}\cup\{[1]\} \end{bmatrix}$$

(101)

$$X''[\text{SUBJ} < >] \rightarrow Y''[\text{LOC}[1]], \quad S[fin] \begin{bmatrix} \text{TO-BIND|SLASH }\{[1]\} \\ \text{INHER|SLASH }\{[1],...\} \end{bmatrix}$$

FILLER   HEAD
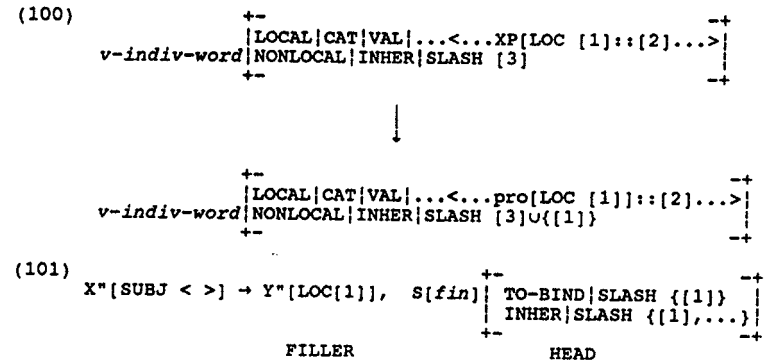
(102)   [SLASH {...[1]...}] ≺ [1]

The lexical rule in (100) takes as input a lexical entry of *v-indiv-word* which has a certain phrasal category within the SUBJ or COMPS list and returns as output a lexical entry that is just the same except that one element has been removed from a valence list and replaced within the INHER|SLASH value. This lexical rule is similar to the subject or complement extraction lexical rule in English (cf. section 1.2.3 in chapter 1) in that one element is removed from a valence feature and replaced in the INHER|SLASH value. However, it differs from that at least in three respects: (i) it restricts the element removed from a valence list to be a phrasal category, (ii) when an element is removed from a valence list, it leaves a coindexed *pro* which stands for an arbitrary (null or overt) proform, and (iii) it states that only an argument of a verb which is *v-indiv-word* can be a value of INHER|SLASH. Structure-sharing of the LOC value between *pro* and the element of the SLASH attribute in the output entry guarantees that these two have the same category and case. The motivation for each restriction will be discussed shortly. The

ID schema in (101) is the same as the head-filler schema in section 1.2.2 of chapter 1 which is proposed for English topicalization construction. The LP constraint in (102) states that a filler daughter must linearly follow the head category which selects the filler in Korean.

In the rest of this section, we will show how the mechanisms suggested in (100)-(102) can account for all the facts about the afterthought construction discussed above. First of all, let us consider the examples in (16) and (48) which are repeated below:

(16) a. [$_{VP}$ Ku chayk-ul ilkulako] seltukhayssta,
          the book-Acc read persuaded
       Mary-ka John-hanthey.
       M-Nom J-to

    'Mary persuaded John to read the book.'

     b. Mary-ka John-hanthey [$_{VP}$ ilkulako] seltukhayssta, ku chayk-ul.
        M-Nom J-to read persuaded the book-Acc

(48) a. Mary-nun [$_s$ John-i ku yenghwa-ul poasstako] sayngkakhayssta.
        M-Top J-Nom the movie-Acc saw thought

    'Mary thought that John saw the movie.'

     b. Mary-nun [$_s$ John-i ____ poasstako] sayngkakhayssta,
        M-Top J-Nom saw thought
        ku yenghwa-ul.
        the movie-Acc

The repeated example above show that an argument can be extracted out of a complement VP or S to be an afterthought expression, when the matrix verb is a control verb or an S-complement verb. On our approach, this is predicted so since we have a flat

structure analysis for the sentences in (16) and (48), as shown in (103), where one of the arguments of the matrix verb *sayngkakhayssta* 'thought', which is attracted from the embedded verb *poasstako* 'saw', becomes a value of INHER|SLASH by the lexical rule in (100).

(103)
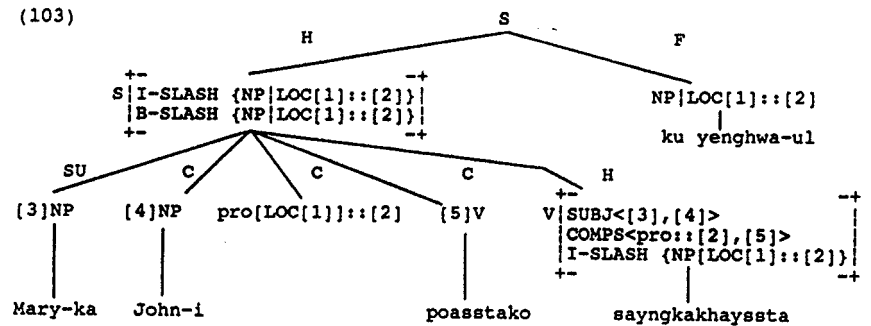
Here the NP *ku yenghwa-lul* 'the movie' which is the value of INHER|SLASH is licensed to occur after the matrix verb *sayngkakhayssta* 'thought' by the ID schema in (101) and the LP constraint in (102).

Even though our analysis uses the mechanism of SLASH dependency to account for afterthought expressions, the SLASH dependency involved is not a truly unbounded dependency construction, since only a root verb (*v-indiv-word*) can license *pro*. That is, the following "expected" analysis is impossible since the embedded verb *poasstako* 'saw' is not a root verb:

(104) *

```
                          H              S
            +-                        -+                    F
    S|I-SLASH {NP|LOC[1]::[2]}|                    NP|LOC[1]::[2]
    |B-SLASH {NP|LOC[1]::[2]}|
            +-                        -+                ku yenghwa-ul
       SU                    C                 H
    [3]NP              S[I-SLASH {NP|LOC[1]::[2]}]
     |
   Mary-ka          SU          C          H              V
                                                    sayngkakhayssta
      [4]NP      pro[LOC[1]]::[2]   [5]V[I-SLASH {NP|LOC[1]::[2]}]
       |                                      |
     John-i                               poasstako
```
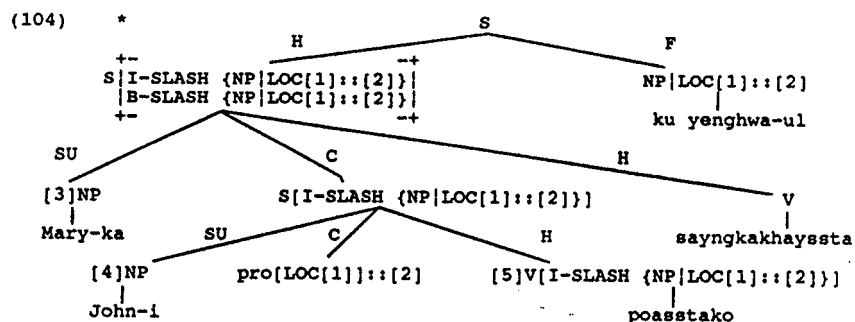
This suggests that the afterthought expression construction in Korean is a third type construction which differs from scrambling and English- or Chinese-style topicalization.

As shown in (32c), repeated below, an argument of the VP complement of a raising verb cannot be extracted out of the VP to be an afterthought expression.

(32) c. ?? Mary-ka John-ul   [vp isstako]   mitnunta, New York-ey.
          M-Nom   J-Acc   stay   believe   New York-at
          'Mary believes John to be/stay at New York.'

This fact is also correctly predicted. The raising verb construction has only one structure where the raising verb takes a VP as one of its complement. Thus the structure for the non-extracted version of (32c) is roughly as in (105):

(105)

```
                          S
    NP        NP              VP                    V
     |         |         PP        V                |
   Mary-ka   John-ul  New York-ey  isstako       mitnunta
```
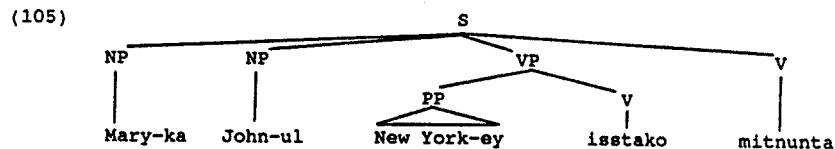
The only way to form an ill-formed sentence like (32c) from (105) is to assume that the PP *New York-ey* 'at New York' can be a value of INHER|SLASH of the embedded verb *isstako* 'stay'. However, the PP can never be the SLASH value of the verb because the verb is *v-comp-word* which is completed with a complementizer suffix *-ko*. I.e., the lexical rule in (100) states that only a matrix verb which is *v-indiv-word* can take an argument as its SLASH value.

Our analysis also predicts that an argument cannot be extracted out of an adjunct or a sentential subject to be an afterthought expression. The relevant examples are repeated below:

(59) b. * Mary-ka [NP [s ___   an   pon]   salam-ul]   mannaci
             M-Nom   not   see   person-Acc   meet
             moshayssta, ku yenghwa-lul.
             did not   the movie-Acc
             'Mary did not meet any person who did not see the movie.'

(60) b. * Mary-nun [s kicha-ka   ___   imi   tochakhaysski ttaymwuney]
             M-Top   train-Nom   already   arrive   because
             pyo-lul   howanpwulhayssta, ku yek-ey.
             ticket-Acc   refunded   the station-at
             'Mary refunded a ticket because the train already arrived at the station.'

(61) b. *[s   Mary-ka ___ pon   kes]-i   motwu-eykey palkhieciessta,
             M-Nom   saw   COMP-Nom all-to   become known
             ku yenghwa-lul.
             the movie-Acc
             'It became known to all (people) that Mary saw the movie.'

On our approach to scrambling through the mechanism of argument attraction, long-distance scrambling is possible only out of a complement VP or S, but not out of an

adjunct or a sentential subject, i.e., only the argument(s) of a complement verb are attracted to the COMPS list of the matrix verb. Thus, arguments within an adjunct or a sentential subject cannot be attracted to the COMPS list of the matrix verb, and hence the non-extracted version of (59b) for example has only the following structure:

(106)
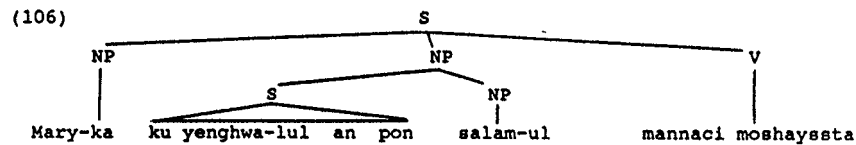
In (106), the NP *ku yenghwa-lul* 'the movie' within the relative clause cannot be the value of the INHER|SLASH of the head verb of the relative clause, *pon* 'saw', because the verb is *v-mod-word*, which is completed with a modifier suffix *-n*, not *v-indiv-word*. Hence, no constituent can be the value of INHER|SLASH of that verb and be extracted out of the relative clause to be an afterthought expression. Exactly the same account is possible for the ill-formedness of (60b) and (61b). Thus, in (60b), the head verb of the adjunct clause is *n-free-stem*, which is completed with a nominalizer suffix *-ki*, and in (61b), the head verb of the sentential subject is *v-mod-word*, which is completed with a modifier suffix *-n*, as in (59b).

The afterthought construction does not occur within an embedded clause or VP, as shown in (92b), repeated below:

(92) b. * Mary-nun [s John-i   poasstako,   ku yenghwa-lul]
             M-Top   J-Nom   saw   the movie-Acc
             sayngkakhayssta.
             thought
             'Mary thought John saw the movie.'

This fact is also accounted for by the lexical rule in (100). In Korean, the head verb of an embedded clause or VP, whatever it is a complement or an adjunct, never ends with a mood suffix and cannot be *v-indiv-word*. Therefore, an argument within an embedded clause or VP can never be the value of INHER|SLASH.

A lexical category such as a verb cannot independently be an afterthought expression, as shown in (107):

(107) a. Mary-ka John-i   oasstako malhayssta.
           M-Nom   J-Nom   came   told
           'Mary told that John came.'

       b. * Mary-ka John-i ___   malhayssta, oasstako.
              M-Nom   J-Nom   told   came

On our approach, this fact is accounted for by the restriction in the lexical rule in (100). (100) restricts the element that can be a value of INHER|SLASH to be a phrasal category. Hence, in (107) even though the embedded verb *oasstako* 'came' can be a complement of the matrix verb, it cannot be a SLASH value of the matrix verb and be an afterthought expression.

Finally, let us consider the fact about a resumptive pronoun as shown in (93b), repeated below:

(93) b. (?)   Na-nun   [$_s$ Mary-ka   ku$_i$-lul   cohahantako]
           I-Top   M-Nom   he-Acc   like
           sayngkakhayssta,   John$_i$-ul.
           thought   J-Acc
           'I thought Mary liked John.'

In (93b) above, the postverbal NP *John-ul* is the SLASH value of the matrix verb *sayngkakhayssta* 'thought'. As shown in the lexical rule in (100), when an NP is removed from the COMPS list of the matrix verb to be replaced in the SLASH value, it leaves *pro* which is a null or overt pronominal in the COMPS list. The overt pronoun *ku-lul* in (93b) is a realization of the arbitrary *pro*.

We want to close this section with discussion of an English construction, namely the right dislocation construction, which is suggested to be syntactically similar to the afterthought phenomenon in some respects (Whitman (1991) and Peter Culicover (personal communication)). The examples are given in (108)

(108) a.   She read the book, Mary.

     b.   He called before Mary did, John.

     c.   * John called before she did, Mary

     d.   * (The fact) that she left bothers me, Mary.

                 (Peter Culicover (personal communication))

     e.   I said that they will leak the story to the press, the cops, two weeks ago.

     f.   I said that they will leak the story to the press two weeks ago, the cops.

                 (=(25) in Whitman (1991))

Whitman (1991) tries to provide a uniform account of both English right dislocation and afterthought phenomenon by assuming that both are derived from parenthetical insertion and rightward movement of the parenthetical. For example, (108f) is derived as in (109):

(109) a. I said that they, [the cops,]$_i$ will leak the story to the press two weeks ago.

      b. I said that they t$_i$ will leak the story to the press two weeks ago, [the cops].

Even though this line of approach may account for the given facts of English right dislocation, careful observations reveal some differences between the two constructions, and it is not clear how they can be accounted for in a uniform way. As admitted by Whitman himself, a Japanese and Korean sentence with parenthetical insertion (e.g., (110a)) is awkward when both the host and the parenthetical has overt case marking, while the sentence becomes good when the putative parenthetical occurs after the matrix verb (e.g., (110b)):

(110) a.   ?? Mary-ka   ku kes-ul,   [cencayng kwa pyunghwa-lul,]   ilkessta.
              M-Nom   it-Acc   war and peace-Acc   read
              'Mary read *war and peace*.'

      b.   Mary-ka   ku kes-ul   ilkessta,   cencayng kwa pyunghwa-lul.
              M-Nom   it-Acc   read   war and peace-Acc

Another problem with the uniform analysis is that there seems to be no straightforward way to account for the difference between the two constructions with respect to the root phenomenon. As shown in (92b), the afterthought does not allow a

constituent to be a postverbal expression within an embedded clause in Korean. However, the same pattern is allowed in English right dislocation as shown in (108e).

4.4.3.2. Adjunct Scrambling

In previous sections, we focused only on scrambled or afterthought arguments. However, an adjunct expression in Korean that modifies a verbal expression can also scramble with arguments, as shown in (111b,c), and be an afterthought expression as shown in (111d):

(111) a. Ku kongwen-eyse   Mary-ka   John-ul   mannassta.
           the park-at   M-Nom   J-Acc   met

       'Mary met John at the park.'

   b. Mary-ka   ku kongwen-eyse   John-ul   mannassta.
       M-Nom   the park-at   J-Acc   met

   c. Mary-ka   John-ul   ku kongwen-eyse   mannassta.
       M-Nom   J-Acc   the park-at   met

   d. Mary-ka   John-ul   mannassta,   ku kongwen-eyse.
       M-Nom   J-Acc   met   the park-at

In this section, we will discuss how to handle scrambled and afterthought adjuncts.

We have already shown that there is no evidence for hierarchical sentence structure in Korean and assumed a flat structure for a sentence. Hence it is natural to posit that an adjunct is also licensed by the flat structure. Actually, Kasper (1994) assumes that an adjunct is a sister to a complement and hence to a head verb, i.e., an

adjunct is also licensed by a flat structure, in order to account for scrambling among complements and adjuncts in German. In this flat structure analysis, we need the following *Head-Subject-Complement-Adjunct* schema for Korean:

```
(112)
+-       -+                                          +-  +-  +-      -+-+
|SUBJ < > |  →  [1],      [2], ·     [4],      [3]V|HEAD|VAL|SUBJ[1] | |
|COMPS < >|                                        |    |   |COMPS[2]| |
|ADJT < > |                                        |    |   |ADJT[4] | |
+-       -+                                          +-  +-  +-      -+-+
               SUBJ⁺      COMPS*     ADJT*                   HEAD
```
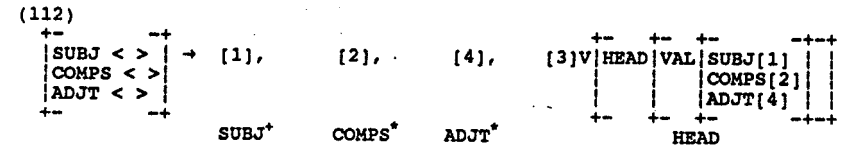
(112) states that zero or more adjuncts can appear in a clause and that when at least one adjunct appears in a clause, it is a sister to the arguments (subject and complements) and to the verb which subcategorizes for the arguments. Here the category [3]V is the value of the feature MOD(IFIED) of an adjunct daughter, which says that [3]V is modified by the adjunct. (See section 1.2.2 in chapter 1 for the MOD attribute.)

A potential problem for (112) may be that it is hard to handle the semantic scope among the adjuncts when there are more than one adjunct. In Kasper (1994), the scope of multiple adjuncts is captured in the flat structure analysis (i) by the order of adjunct daughters in the adjunct daughter list, which is ordered not by the surface order of the adjuncts but by their semantic scope, and (ii) by a split of the MOD value into SYN and SEM, reflecting the dual nature of adjuncts as semantic heads (functors), but syntactic nonheads. (See Kasper (1994) for more detailed discussion on this matter.) If we represented all the technical details in Kasper (1994), we would need a more complicated schema than (112). In this section, however, the rough schema in (112) will suffice for the purpose of showing how adjuncts are handled in a flat structure.

A controversial matter in (112) is the handling of adjuncts in the valence feature. In (112), we assume that an adjunct can be the valence value even though its status differs from a subject or a complement. This difference is represented by the different feature name. In Korean, there seems to be no syntactic difference between arguments and adjuncts, i.e., both can scramble within a clause, scramble out of an S- or VP-complement, be afterthought expressions in a simplex clause and be extracted out of an S- or VP-complement to be afterthought expressions. However, an adjunct differs from an argument in its semantics. For example, an adjunct does not have any specific semantic role in a predicate which is modified by the adjunct, and it is a semantic head in that the CONTENT value of an adjunct is identical to that of the mother node. These facts will be discussed one by one shortly.

A special property of (112) is that the value of an adjunct that modifies a predicate is co-specified in the valence value of the predicate, i.e., as generally assumed, an adjunct still selects what it modifies, but the value of the modifier is also specified in the valence value of the modified predicate.[22]

In this section, we focus on the case where an adjunct scrambles out of a VP or S complement. As pointed out in Saito (1985), an adjunct generally can scramble out of a complement clause or a VP complement, as shown in (113)-(114):

---

[22]The idea of co-specification of the modifier and modified can be considered as a hybrid of Pollard and Sag (1987) and Pollard and Sag (1994). In the former, a modifier is selected by the modified category, while in the latter, the modified category is selected by its modifier.

(113) a. Mary-ka [s John-i nayil kkaci ku swukcey-lul
M-Nom J-Nom tomorrow by the homework-Acc
machyeya-hantako] malhayssta.
finish-must told

'Mary told that John had to finish the homework by tomorrow.'

b. (?) Nayil kkaci Mary-ka [s John-i ___ ku swukcey-lul
tomorrow by M-Nom J-Nom the homework-Acc
machyeya-hantako] malhayssta.
finish-must told

(114) a. Mary-ka John-hanthey [vp nayil kkaci ku swukcey-lul
M-Nom J-to tomorrow by the homework-Acc
machilako] malhayssta.
finish told

'Mary told John to finish the homework by tomorrow.'

b. (?) Nayil kkaci Mary-ka John-hanthey [vp ___
tomorrow by M-Nom J-to
ku swukcey-lul machilako] malhayssta.
the homework-Acc finish told

c. (?) Mary-ka nayil kkaci John-hanthey [vp ___
M-Nom tomorrow by J-to
ku swukcey-lul machilako] malhayssta.
the homework-Acc finish told

Here, (113b) and (114b,c) are slightly marginal compared with (a) counterparts, but they are quite acceptable. On our approach, this fact can be accounted for by the flat structure analyses of (113) and (114), under the assumption that an adjunct of a complement verb can also be attracted to the ADJT list of a matrix verb when arguments are attracted. To this end, we revise the argument attraction lexical rules in (70) and (81) into (115) and (116), respectively:

```
(115) +- +- +-
      |CAT|VAL|SUBJ <NP[str]::[1]>                                 +-+-+
      |   |   |COMPS [2]<(NP::[3])>o<VP[SUBJ <NP[str]::[α]>]:[4]>   | | |
      |   |   |ADJT [7]                                            +-+ |
      |   +- +-                                                         |
      |CONTENT[5]| RELN x            +                                  |
      |          | ARG1  [1]         |                                  |
      |          |(ARG2  [3])        |                                  |
      |          | SOA-ARG [4]       |                                  |
      +-         +-                  +                                 -+

                              ↓

+- +- +-
|CAT|VAL| SUBJ <NP[str]::[1]>                              +-+-+
|   |   |                       +-                          | | |
|   |   | COMPS <[2]o/V|SUBJ<NP[str]::[α]>|:[4]\o[6]        | | |
|   |   |            |  |COMPS [6]        |                 | | |
|   |   |            |  |ADJT [8]         |                 | | |
|   |   |            \  +-               /                  +-+ |
|   |   | ADJT [7]o[8]                                          |
|   +- +-                                                       |
|CONTENT [5]                                                   -+
+-

    (Here <X0,...,Xi> o <Xj,...,Xn> is <X0,...,Xn>, and α = 1 or 3.)

(116)
                  +- +-
                  |CAT|SUBJ [1]<NP[str]::[2]>              -+ -+
                  |   |COMPS [4]<(NP[dat])>o<S:[5]>         |  |
                  |   |ADJT [10]                            |  |
                  |   +-                                    |  |
                  |                                         |  |
                  |CONTENT[6]|RELN x            +           |  |
                  |          |ARG1 [2]          |           |  |
                  |          | .                |           |  |
                  |          | :                |           |  |
                  |          |SOA-ARG [5]|                  |  |
                  +-         +-          +-                -+ -+

                              ↓

+- +-
|CAT|SUBJ [1]                                         +-+-+
|   |                +-                                | | |
|   |COMPS [4]o/V|SUBJ<NP[str]::[9]>|:[5]\o<NP[nom]::[9]>o[8]| |
|   |          |  |COMPS [8]        |                  | | |
|   |          |  |ADJT [11]        |                  | | |
|   |          \  +-               /                   | | |
|   |ADJT [10]o[11]                                    | | |
|   +-                                                 +-+ |
|CONTENT [6]                                              -+
+-
```
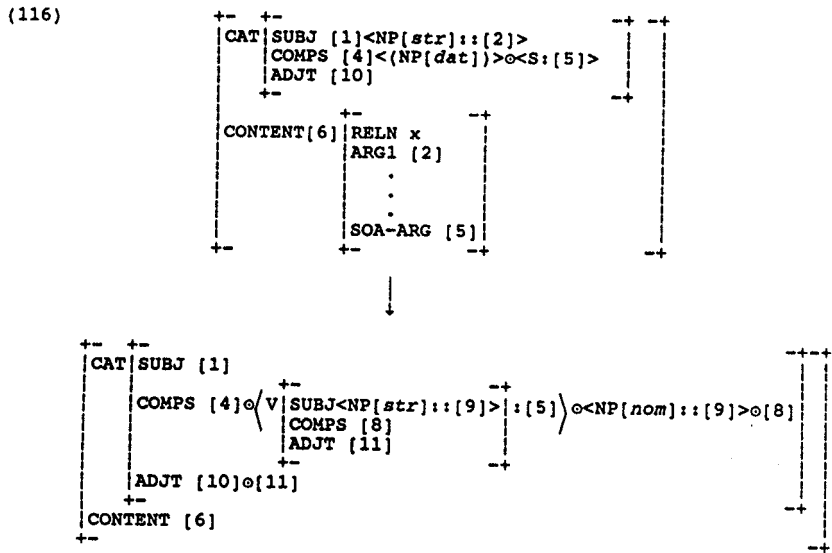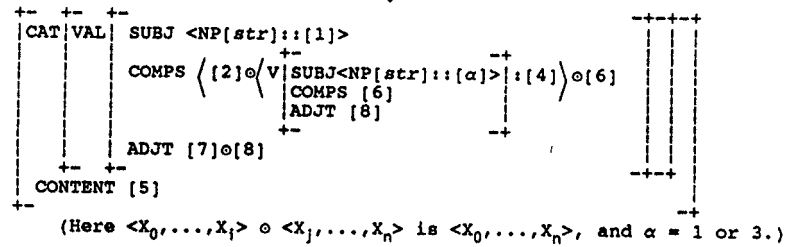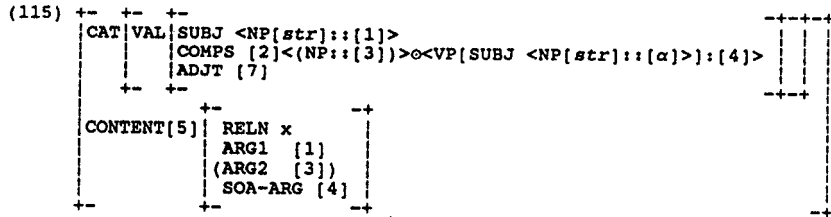
(115) and (116) differ from (70) and (81) only in that in the former, the adjunct (ADJT)

list of a complement verb is attracted to the ADJT list of a matrix verb as well.

On this approach, the structures in (117) and (118) are assumed for (113b) and (114b), respectively.

(117) a.

```
        ADJT    SUBJ  COMP  COMP          S          COMP          H
        PP      [1]NP [2]NP [4]NP                    [5]V          [6]V
        [MOD<[5]V>]
        nayil kkaci  Mary-ka John-i  ku swukcey-lul machyeya-hantako malhaysста
```

b.
```
   [6]V|SUBJ <[1]NP>                                           -+
       |          +-                              -+            |
       |COMPS/[5]V|SUBJ <[2]NP::[3]>               |           |
       |     |    |COMPS <[4]NP>                   |, [2]NP::[3], [4]NP\
       |     |    |ADJT <[7]PP[MOD<[5]V>]>         |            |
       |     |    +-                              -+            |
       |ADJT [7]                                               -+
       +-
```

(118) a.

```
        ADJT    SUBJ      COMP        S    COMP          COMP          H
        PP      [1]NP     [2]NP           [4]NP         [5]V          [6]V
        [MOD<[5]V>]
        nayil kkaci  Mary-ka John-hanthey ku swukcey-lul machilako   malhaysста
```

b.
```
   [6]V|SUBJ <[1]NP>                                           -+
       |          +-                              -+            |
       |COMPS/          [5]V|SUBJ <NP::[3]>        |            |
       |     | [2]NP::[3],  |COMPS <[4]NP>         |, [4]NP\
       |     |              |ADJT <[7]PP[MOD<[5]V>]>|           |
       |     |              +-                     -+           |
       |ADJT [7]                                               -+
       +-
```

Here the adjunct PP *nayil kkaci* 'by tomorrow' takes the complement [5]V as its MOD value. Note that the schema in (112) is nonspecific as to whether the modified category is the head verb or a complement verb. The structures in (117) and (118) instantiate the

latter case, where the modified category is a complement verb. In this case, if we directly apply the semantic principle mentioned in section 1.2.3, which is repeated in (119), we cannot get the correct interpretation.

(119)   In a headed phrase, the CONTENT value is token-identical to that of the adjunct

daughter if the DTRS value is of sort *head-adjunct-struc*, and to that of the head

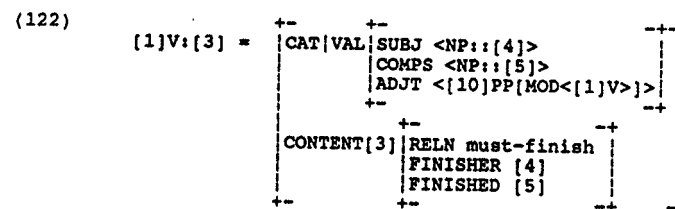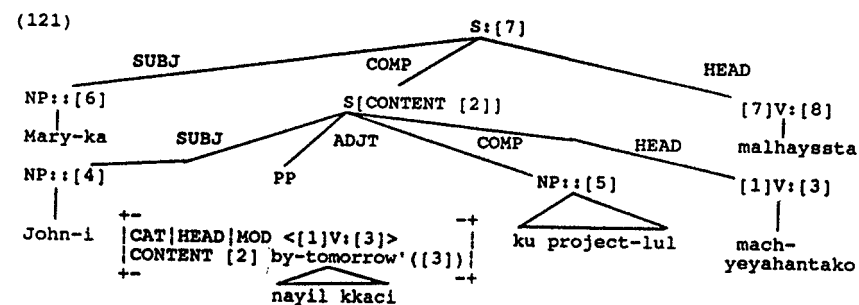daughter otherwise. (Pollard and Sag (1994): 56))

The daughters of the S category in (117) and (118) are *head-subj-comp-adjunct-structure* which contains an adjunct daughter. Then by (119), the semantic content of the whole sentence in (117) must be identical to the semantic content of the widest-scoping adjunct daughter, which can be roughly represented as by-tomorrow'(necessarily'(finish' (Mary', the-project'))). However, this is obviously not the correct interpretation of the whole sentence. This problem can be solved by a slight revision of (119) into (120):

(120)   In a headed phrase, the CONTENT value is token-identical to that of an adjunct

daughter if the head daughter is the value of MOD of the adjunct daughter, and
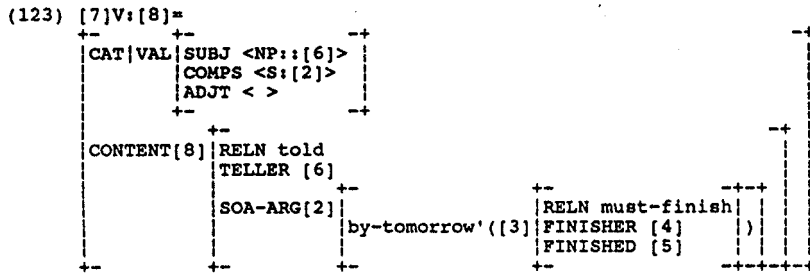
to that of the head daughter otherwise.

In (117), the adjunct daughter does not take the head daughter as its MOD value, and hence the CONTENT of the whole sentence is the same as that of the head daughter, which is roughly represented as follows by intensional logic: told'(Mary', by-

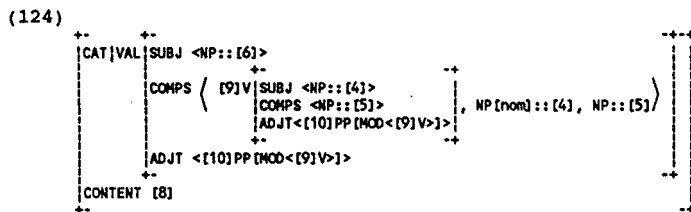tomorrow'(necessarily'(finish' (Mary', the-project')))).

On our approach, the lexical rules in (115) and (116) play a crucial role in the determination of the correct meaning mentioned above. Here the important point is that the value of the CONTENT of the input entry is token-identical to that of the output entry, i.e., only the valence value of the input entry differs from that of the output value. (121) shows the structure of (113a) which is licensed by the input entry of the lexical rule. Here the structures of [1]V:[3] and [7]V:[8] are shown in (122) and (123), respectively.[23]

(121)

```
                                                S:[7]
            SUBJ                 COMP                          HEAD
    NP::[6]                  S[CONTENT [2]]                        [7]V:[8]
      |                                                               |
    Mary-ka      SUBJ        ADJT          COMP          HEAD       malhayssta
    NP::[4]                   PP                  NP::[5]            [1]V:[3]
      |          +-                         -+                         |
    John-i      |CAT|HEAD|MOD <[1]V:[3]>     |   ku project-lul       mach-
                |CONTENT [2] by-tomorrow'([3])|                       yeyahantako
                +-                           -+
                     nayil kkaci
```

(122)
```
                  +-          +-                    -+-+
    [1]V:[3] =    |CAT|VAL|SUBJ <NP::[4]>            | |
                 |       |COMPS <NP::[5]>           | |
                 |       |ADJT <[10]PP[MOD<[1]V>]>  | |
                 |       +-                      -+ |
                 |       +-               -+        |
                 |CONTENT[3]|RELN must-finish |      |
                 |          |FINISHER [4]     |      |
                 |          |FINISHED [5]     |      |
                 +-         +-               -+     -+ -+
```

---

[23]Here in order to simplify the CONTENT value, we do not provide the semantics of the modal auxiliary verb *-hanta* 'must', which is not directly relevant to current discussion. Also we simplify the CONTENT value of the adjunct *nayil kkaci* 'by tomorrow' by using the notation of intensional logic: by-tomorrow'([3]).

```
(123) [7]V:[8]=
+-     +-                    -+
|CAT|VAL|SUBJ <NP::[6]> |
|       |COMPS <S:[2]> |
|       |ADJT < > |
|       +-                   -+
|        +-                              -+
|CONTENT[8]|RELN told                     |
|          |TELLER [6]                     |
|          |           +-          -+-+    |
|          |SOA-ARG[2]||            |RELN must-finish| |  |
|          |          |by-tomorrow'([3]|FINISHER [4]   |)| |
|          |          |            |FINISHED [5]     | | |
+-         +-         +-           +-        -+-+-+-+
```

If we apply the lexical rule in (116) to (123), it will give the following output entry:

```
(124)
+-     +-
|CAT|VAL|SUBJ <NP::[6]>
|       |       +-
|       |COMPS  / [9]V|SUBJ <NP::[4]>              -+
|       |       |     |COMPS <NP::[5]>             |, NP[nom]::[4], NP::[5]/
|       |       |     |ADJT<[10]PP[MOD<[9]V>]>|
|       |       +-                              -+
|       |ADJT <[10]PP[MOD<[9]V>]>
|CONTENT [8]
+-
```

The lexical entry in (124) is the same as the head verb [6]V in (117b) and licenses the flat structure in (117a), whereas the one in (123) is the same as the matrix head verb [7]V in (121) and licenses the hierarchical structure in (121). However, their CONTENT value is identical so that the structures in (117) and (121) have exactly the same interpretation. That is, the CONTENT value of the whole sentence in (117) is the same as that of the whole sentence in (121), which can roughly be represented by the CONTENT value [8] in (123).

A problem for our analysis seems to be an asymmetrical distribution of adjuncts in S- and VP-complement structures. The flat structures in (117) and (118) predict that

an adjunct which modifies the matrix head verb also may occur at any place in a sentence. This prediction is borne out in the case of the VP-complement construction. The sentences in (125) show that the PP *ilcwuil ceney* 'one week ago' which modifies the matrix verb *malhayssta* 'told' can occur any place in a sentence:

(125) a. Mary-ka ilcwuil ceney John-hanthey ku project-lul kkutnaylako
        M-Nom   one week ago J-to   the project-Acc finish
        malhayssta.
        told

   'One week ago Mary told John to finish the project.'

   b. Mary-ka John-hanthey ilcwuil ceney ku project-lul kkutnaylako
      M-Nom   J-to   one week ago the project-Acc finish
      malhayssta.
      told

   c. (?) Mary-ka John-hanthey ku project-lul ilcwuil ceney
           M-Nom   J-to   the project-Acc one week ago
           kkutnaylako malhayssta.
           finish   told

   d. Mary-ka John-hanthey ku project-lul kkutnaylako ilcwuil ceney
      M-Nom   J-to   the project-Acc finish   one week ago
      malhayssta.
      told

Even though (125c) is slightly marginal compared with the others, it is quite acceptable when a short pause is given after the adjunct or stress is given to the adjunct.[24] As

---

[24]Presently, it is not clear why (125c) is awkward. Our conjecture is that the awkwardness may be due to some processing factor. In Korean, when an adjunct immediately precedes a category which is modifiable by the adjunct, speakers tend to try to interpret the adjunct as modifying the immediately following category. In (125c), the adjunct *ilcwuil ceney* 'one week ago' immediately precedes the verb *kkutnaylako* 'finish',

(133a,b), which are variations of (130b) and (131b), respectively:

(133) a. (?) Enehak-ul   yelsimhi Mary-nun   [s John-i ___   ___
           linguistics-Acc hard   M-Top   J-Nom
           kongpwuhaysstako] sayngkakhanta.
           studied   think
           'Mary thinks John studied linguistics hard.'

   b. (?) Enehak-ul   yelsimhi Mary-ka John-hanthey [vp ___   ___
          linguistics-Acc hard   M-Nom   J-to
          kongpwuhalako] malhayssta.
          study   told
          'Mary told John to study linguistics hard.'

In (133), the ADVP scrambles out of the S- or VP-complement together with an object

NP of the embedded verb. These sound much better than (130b) or (131b), and can be

considered to be acceptable. Thus, in our analysis, it seems that we need to assume the

unacceptable (b) sentences in (130) and (131) to be licensed by syntax but to be ruled out

by certain processing factors. That is, ADVPs are considered the same as other kind of

adjuncts and there is no specific syntactic constraint on ADVP scrambling such as (132).

This analysis predicts sentences in (130b) and (131b) to become acceptable if certain

processing factors are satisfied. Presently, we do not know exactly what processing

factors are generally involved here. We just assume one of the factors is scrambling of

another constituent that is an argument of the predicate which is modified by the ADVP,

as shown in (133).

   In the rest of this section, we will discuss the case where an adjunct is used as an

afterthought expression. As shown above, an adjunct generally can scramble out of an S-

and VP-complement, just as an argument can. This parallelism of scrambling possibilities

between adjuncts and arguments leads us to predicting that an adjunct also can be

extracted from an S- and VP-complement, but not out of an adjunct or a sentential

subject, to be used as an afterthought expression. This prediction is borne out, as shown

in (134a,b), which are variations of (113a) and (114a), respectively; and (135) and (136)

which are examples of an afterthought expression out of an adjunct and a sentential

subject, respectively. (cf. (59)-(61) for the cases of arguments)

(134) a. Mary-ka [s John-i ___   ku swukcey-lul
         M-Nom   J-Nom   the homework-Acc
         machyeya-hantako] malhayssta, nayil kkaci.
         finish-must   told   tomorrow by
         'Mary told that John had to finish the homework by tomorrow.'

   b. Mary-ka John-hanthey [vp ___   ku swukcey-lul
      M-Nom   J-to   the homework-Acc
      machilako] malhayssta, nayil kkaci.
      finish   told   tomorrow by
      'Mary told John to finish the homework by tomorrow.'

(135) a. Mary-ka John-hanthey [np [s nayil kkaci   machyeya-ha-nun]
         M-Nom   J-to   tomorrow by finish-must-MOD
         swukcey-lul]   naycwuessta.
         homework-Acc   assigned

      'Mary assigned to John a homework that (he) must finish by tomorrow.'

   b. * Mary-ka John-hanthey [np [s ___   machyeya-ha-nun]
        M-Nom   J-to   finish-must-MOD
        swukcey-lul]   naycwuessta, nayil kkaci.
        homework-Acc   assigned   tomorrow by

(136) a. [S Mary-ka ku swukcey-lul nayil kkaci machyeya-ha-nun
     M-Nom the homework-Acc tomorrow by finish-must-MOD
     kes]-i howaksilhata.
     COMP-Nom be obvious

    'That Mary must finish the homework by tomorrow is obvious.'

  b. * [S Mary-ka ku swukcey-lul ___ machyeya-ha-nun kes]-i
     M-Nom the homework-Acc finish-must-MOD COMP-Nom
     howaksilhata, nayil kkaci.
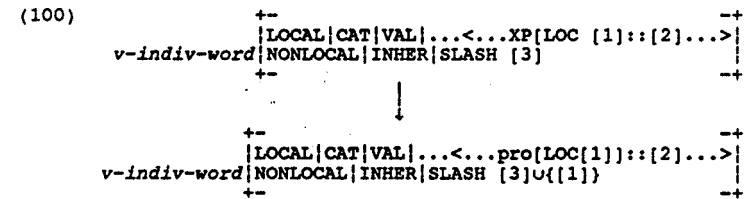   be obvious tomorrow by

An afterthought adjunct also has other properties shared by an afterthought argument, i.e., it cannot occur within an embedded sentence or VP, as shown in (137), and allows a resumptive pronoun, as illustrated in (138):

(137) a. * Mary-ka [S John-i ku swukcey-lul
     M-Nom · J-Nom the homework-Acc
     machyeya-hantako · nayil kkaci] malhayssta.
     finish-must tomorrow by told
     'Mary told that John had to finish the homework by tomorrow.'

  b. * Mary-ka John-hanthey [VP · ku swukcey-lul
     M-Nom J-to the homework-Acc
     machilako nayil kkaci] malhayssta.
     finish tomorrow by told
     'Mary told John to finish the homework by tomorrow.'

(138) Mary-ka [S John-i kekise_i . ku kangaci-lul
    M-Nom J-Nom there the puppy-Acc
    palkyenhaysstako] malhayssta, ku kongwen-eyse_i.
    found told the park-at
    'Mary told that John found the puppy at the park.'

We can account for all the facts about adjunct afterthought expressions mentioned

above with the valence extraction lexical rule in (100), which is repeated below:

(100)
```
                        +-                                -+
                        |LOCAL|CAT|VAL|...<...XP[LOC [1]::[2]...>|
        v-indiv-word|NONLOCAL|INHER|SLASH [3]               |
                        +-                                -+
                                    |
                                    ↓
                        +-                                -+
                        |LOCAL|CAT|VAL|...<...pro[LOC[1]]::[2]...>|
        v-indiv-word|NONLOCAL|INHER|SLASH [3]∪{[1]}         |
                        +-                                -+
```

In (134), the adjunct *nayil kkaci* 'by tomorrow' can be an afterthought expression. The adjunct which modifies a complement verb can be attracted to the ADJT list of the matrix verb, whose sort is *v-indiv-word*, by the lexical rules in (115) and (116). This makes it possible for the adjunct to be a value of the INHER|SLASH. In sentences (135) and (136), the adjunct *nayil kkaci* cannot be an afterthought expression since the adjunct which modifies a verb within an adjunct or a sentential subject cannot be extracted to the ADJT value of the matrix verb. The verb within an adjunct or sentential subject is not *v-indiv-word* and so cannot feed the valence extraction lexical rule in (100). Therefore nothing is extracted by the SLASH mechanism from an adjunct and a sentential subject. The sentences in (137) are predicted to be ill-formed by the same reason, i.e., a verb within an S- or VP-complement is not *v-indiv-word* and thus nothing cannot be the value of the INHER|SLASH. Therefore nothing can be an afterthought expression within an embedded clause or VP. The resumptive pronoun *kekise* 'there' in sentence (138) can be accounted for if we assume that a *pro* can be substituted by the overt proform *kekise* 'there'.

shown in (126), however, in the S-complement construction, an adjunct modifying a matrix verb never occurs between the embedded subject and its predicate verb under any circumstance.

(126) a. Mary-ka ilcwuil ceney John-i   ku project-lul   kkutnayya-hantako
           M-Nom   one week ago J-Nom   the project-Acc finish-must
           malhayssta.
           told

           'One week ago Mary told John had to finish the project.'

    b. * Mary-ka   John-i   ilcwuil ceney ku project-lul   kkutnayya-hantako
           M-Nom   J-Nom   one week ago the project-Acc finish-must
           malhayssta.
           told

    c. * Mary-ka   John-i   ku project-lul   ilcwuil ceney kkutnayya-hantako
           M-Nom   J-Nom   the project-Acc one week ago finish-must
           malhayssta.
           told

    d. Mary-ka   John-i   ku project-lul   kkutnayya-hantako ilcwuil ceney
           M-Nom   J-Nom   the project-Acc finish-must   one week ago
           malhayssta.
           told

which is a category modifiable by the PP. Thus, the PP tends to be interpreted as modifying *kkutnaylako* rather than *malhayssta* 'told'. A pause or stress may block this kind of processing interference. This conjecture is supported by (i):

(i)   Mary-ka   John-hanthey ku project-lul   ilcwuil ceney [kuphi
        M-Nom   J-to   the project-Acc one week ago in haste
        kkutnaylako] malhayssta.
        finish   told
   'One week ago Mary told John to finish the project in haste.'

In (i), the adjunct *ilcwuil ceney* 'one week ago' and the embedded verb *kkutnaylako* 'finish' is separated by another adjunct which modifies the embedded verb, and (i) is much better than (125c).

(126b,c) cannot be ameliorated by any pause or stress and makes a sharp contrast with (125c). Therefore, the prediction seems not to be borne out that an adverb which modifies the matrix head verb may occur at any place in a sentence. On our analysis, however, sentences such as (126b,c) can be ruled out by the interpretive principle in (85), repeated below:

(85)   Interpretive Principle

      Suppose (i) that Y is an NP[*nom*], (ii) that X is the first verb to the right of Y, and (iii) that Z is any non-topic constituent which occurs between Y and X. Then Z cannot be a semantic dependent of a verb superordinate to X.

For example, the structure of (126b) is as follows:

(127)

[NP [nom] :: [1]]   NP [nom] :: [2]   PP [MOD< [3] V>]   NP :: [4]   [1] V [ARG [2]]   [3] V [ARG [1]]
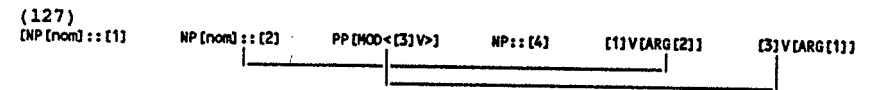
Thus it is ruled out by (85) and not a counterexample to the flat structure analysis.

Now, let us consider some matters that are relevant to LP constraints on adjuncts. The first matter that we need to discuss is the fact that an adjunct cannot occur after a category that is modified by the adjunct, except when the adjunct is used as an afterthought expression. (Afterthought adjuncts will be discussed shortly.) The relevant examples are in (128a) and (128b), which are variations of (113a) and (114a), respectively:

(128) a. * Mary-ka [s John-i   ku swukcey-lul
M-Nom   J-Nom   the homework-Acc
machyeya-hantako   nayil kkaci] malhayssta.
finish-must   tomorrow by told
'Mary told that John had to finish the homework by tomorrow.'

b. * Mary-ka John-hanthey [vp   ku swukcey-lul
M-Nom J-to   the homework-Acc
machilako   nayil kkaci] malhayssta.
finish   tomorrow by   told
'Mary told John to finish the homework by tomorrow.'

To account for this fact, we need to assume another LP constraint in (129) which is

another embodiment of head-finality. (See (74) and (78) for the other LP constraints

encoding head-finality.)[25]

(129) SYNSEM[1] ≺ [ADJT <...[1]...>]

(129) simply states that an adjunct precedes a category which is modified the adjunct.

Another matter that deserves discussion is scrambling of an adverb phrase (ADVP)

which is derived from a verb. ("true adjunct" in terms of Saito (1985)).[26] This kind of

---

[25]Again, all the LP constraints encoding head-finality can be schematized as follows:

(i)   SYNSEM[1] ≺ [VAL|... ≺...[1]...>]

This LP constraint states that an element of any valence list such as the SUBJ, COMPS or ADJT must linearly precede the category selecting the element's SYNSEM value.

[26]These adverbs in Korean are usually derived by suffixing -hi or -key to a root of a stative verb.

adjunct scrambles out of the complement clause or VP only with great difficulty, if at all, as shown in (130)-(131):

(130) a. Mary-nun   [s John-i   yelsimhi enehak-ul   kongpwuhaysstako]
M-Top   J-Nom   hard   linguistics-Acc   studied
think
sayngkakhanta.

'Mary thinks John studied linguistics hard.'

b. ??/* Yelsimhi Mary-nun [s John-i ___   enehak-ul
hard   M-Top   J-Nom   linguistics-Acc
kongpwuhaysstako] sayngkakhanta.
studied   think

(131) a. Mary-ka John-hanthey [vp yelsimhi enehak-ul   kongpwuhalako]
M-Nom J-to   hard   linguistics-Acc   study
malhayssta.
told

'Mary told John to study linguistics hard.'

b. ??/* Yelsimhi Mary-ka John-hanthey [vp ___   enehak-ul
hard   M-Nom   J-to   linguistics-Acc
kongpwuhalako] malhayssta.
study   told

To account for these facts, we might propose the LP constraint in (132), which states that

an ADVP linearly follows a subject of a predicate verb which is modified by the ADVP.

(132)   NP::[1] ≺ ADVP[MOD <[2]V>] ≺ [2]V[SUBJ <NP::[1]>]

However, the LP constraint in (132) is too restrictive, in light of the sentences in

4.5. Summary and Conclusion

In this chapter, we tried to show how the account of scrambling in a simplex sentence via the flat structure analysis can be extended to the account of so-called long-distance scrambling (scrambling out of an S- or VP-complement). This approach to long-distance scrambling entails that clause-internal scrambling is a special case of the same syntactic phenomenon as long-distance scrambling. (See chapter 5 for more discussion of this matter.) The crucial mechanisms in our analysis of long-distance scrambling are valence attraction and lexical rules.

Kiss (1994) extends the argument attraction mechanism in Hinrichs and Nakazawa (1989, 1994) to account for the structures of German modal verb, control verb and raising verb constructions. The suggestions in this chapter share some of the same basic ideas. However, our proposals differ from Kiss (1994) in many respects. The main differences are: (i) in Korean, a matrix verb, its complement verb, and arguments or adjuncts of the complement verb which are attracted to the matrix verb are all sisters when the matrix verb is not an auxiliary verb; (ii) different scrambling possibilities among different VP-complement constructions are accounted for by the applicability of a lexical rule, i.e., whether the matrix verb has only the input entry of the lexical rule, or only the output entry, or both of them; and (iii) scrambling out of an complement clause is also accounted for through the argument attraction mechanism.

Afterthought expressions, by contrast, are treated as a different syntactic phenomenon. Scrambling is similar to afterthought expressions in that both are possible

out of an S- or VP-complement but not out of an adjunct or a sentential subject. This fact is accounted for by making two assumptions: (i) valence attraction from a verb is possible only when a matrix verb takes the verb as its complement, and (ii) only arguments or adjuncts of a matrix verb whose sort is *v-indiv-word* can be the value of the INHER|SLASH.

Scrambling of adjuncts is treated the same as scrambling of arguments since they generally show the same scrambling possibilities. To this end, we assume a co-specification mechanism between the modifier and the modified, i.e., an adjunct selects the modified through the MOD feature, while the value of the adjunct is structure-shared with the ADJT value in the valence feature of the modified category.

In the next chapter (chapter 5), we will discuss what theoretical predictions are possible in our approach to long-distance scrambling.

CHAPTER V

WORD ORDER VARIATIONS IN COMPLEX CLAUSES:

THEORETICAL PREDICTIONS

In chapter 4, we proposed a theory of word order variations in complex clauses. The main point of our proposal was that it is possible to uniformly account for scrambling in simplex and complex clauses if we extend the valence attraction mechanism in chapter 3, which is utilized to account for the auxiliary verb construction. The goal of this chapter is to show what theoretical predictions our theory can make. To this end, we discuss some phenomena that have been raised in previous studies of scrambling: i.e., long-distance passivization, weak crossover effects, licensing of negative polarity items, and long-distance anaphor binding.

5.1. Long-Distance Passivization

Korean has so-called long-distance passivization phenomena, wherein an object of an embedded verb is passivized to the matrix subject, while a passive morpheme is realized on the matrix verb. Examples are given in (1). (See Kiss (1992), Nagai (1991), and

Yatabe (1993) for discussions of long-distance passivization in German and Japanese.)

(1) a. Nay-ka   Mary-hanthey   ku cengchayk-ul sihaynghalako   cisihayssta.
       I-Nom   M-to   the policy-Acc   carry out   ordered
       'I ordered Mary to carry out the policy.'

    b. Ku cengchayk-i   naey-uyhayse Mary-hanthey   sihaynghalako
       the policy-Nom   I-by   M-to   carry out
       cisi-toy-essta.
       order-Pass-Past
       Lit. 'The policy was ordered by me for Mary to carry out.' (It was ordered
       by me for Mary to carry out the policy.)

(2) a. Motun salam-i   hyun cengpwu-ka   ku cengchayk-ul
       all people-Nom   current government-Nom   the policy-Acc
       sihaynghalilako   sayngkakhayssta.
       will carry out   thought
       'All people thought the government would carry out the policy.'

    b. Ku cengchayk-i   motun salamey-uyhayse hyun cengpwu-ka
       the policy-Nom   all people-by   current government-Nom
       sihaynghalilako   sayngkak-toy-essta.
       will carry out   think-Pass-Past
       Lit. 'The policy was believed by all people that the government would carry
       out.' (It was believed by all people that the government would carry out the
       policy.)

(3) a. Motun salam-i   [s hyun kwukhoy-ka   ku pepan-ul
       all people-Nom   current congress-Nom the bill-Acc
       thongkwasikhici malaya hantako]   cwucanghayssta.
       pass must   claimed
       'All people claimed that the current congress must not pass the bill.'

    b. Ku pepan-i   motun salam-eyuyhayse hyun kwukhoy-ka
       the bill-Nom all people-by   current congress-Nom
       thongkwasikhici malaya hantako   cwucang-toy-essta.
       pass not must   claim-Pass-Past
       'The bill was claimed by all people that the current congress must not pass.'
       (It was claimed by all people that the congress must not pass the bill.)

In (1b), the object NP *ku cengchayk-ul* 'the policy' within the VP complement is passivized, while the passive morpheme *-toy* is realized on the matrix verb, e.g., *cisi-toy-essta* 'was ordered'. The same long-distance passive is also possible out of the S complement as shown in (2b) and (3b). This kind of passivization may be problematic for phrase structure grammar in general, because under standard assumptions, an object can be passivized only when it is an argument of a verb on which a passive morpheme is realized.
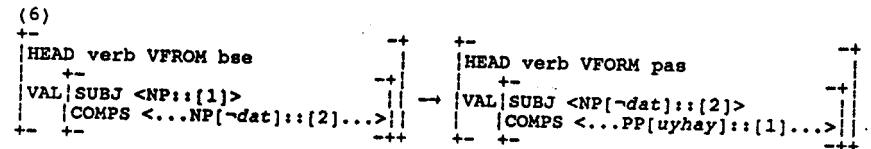
Note that the subject of the embedded clause also can be the subject of the long-distance passive, as shown in (4) and (5) which are variations of (2) and (3):[1]

(4) Hyun cengpwu-ka   motun salam-eyuyhayse
     current government-Nom   all people-by
     ku cengchayk-ul sihaynghalilako   sayngkak-toy-essta.
     the policy-Acc   will carry out   think-Pass-Past
     Lit. 'The current government was thought by all people to carry out the policy.

(5) Hyun kwukhoy-ka   motun salam-eyuyhayse
     current congress-Nom   all people-Nom
     ku pepan-ul   thongkwasikici malaya hantako cwucang-toy-essta.
     the bill-Acc   pass not must   claim-Pass-Past
     Lit. 'The current congress was claimed by all people to have not to pass the bill.'

This long-distance passivization phenomenon is naturally accounted for by our theory of long-distance scrambling, which was proposed in chapter 4. According to the theory, the object NP *ku cengchayk-ul* 'the policy' or *ku pepan-ul* 'the bill' of the

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[1]For some speakers, (4) and (5) are better than (2b) and (3b), while for the others, (2b) and (3b) are better than (4) and (5). However, both types of sentences are generally acceptable for both groups of speakers.
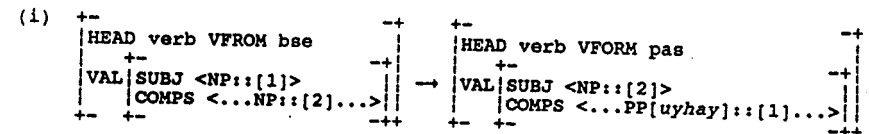
embedded verb in (1)-(3) can be attracted to the COMPS list of the matrix verb. Then the attracted NP can be passivized to the subject by the passive lexical rule in (6), while the passivization morpheme is realized on the matrix verb.

(6)
```
+-                               -+    +-                                  -+
|HEAD verb VFROM bse            |     |HEAD verb VFORM pas                |
|    +-                     -+  |     |    +-                        -+   |
|VAL|SUBJ <NP::[1]>          |  | →   |VAL|SUBJ <NP[¬dat]::[2]>       |   |
|   |COMPS <...NP[¬dat]::[2]...>| |     |   |COMPS <...PP[uyhay]::[1]...>|  |.
+-  +-                     -++  |     +-  +-                        -++   |
```
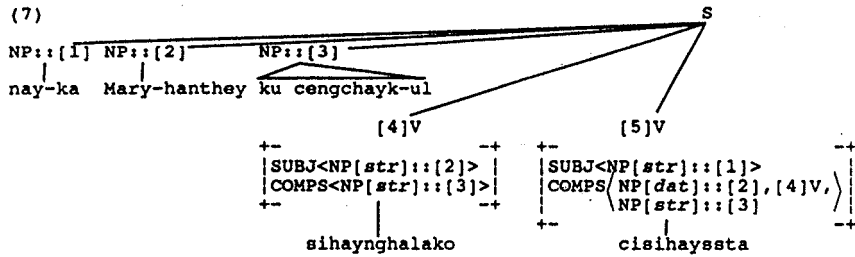
The passive lexical rule in (6) takes as input a base form verb and gives as output a passive form verb. The subject of the input is removed from the SUBJ list, and its index is reassigned to the PP complement of the output. And the non-dative NP complement (nominative or structural NP) of the input is placed in the SUBJ list of the output entry.[2]
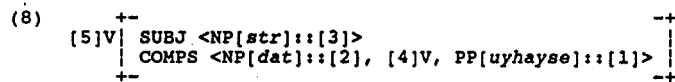
For instance, the structure of (1a) can be analyzed as a flat structure as in (7):

---

[2]As mentioned in section 4.1.2 in chapter 4, it is controversial whether the NP+*hanthey* is a dative NP or a PP headed by a postposition *hanthey*. We assumed it to be a dative NP for expository convenience. However, the passive lexical rule in (6) can be more naturally formulated if the dative NP is assumed to be a PP, because then we can say that any NP complement can be passivized into the SUBJ list without stipulating [¬*dat*] on the complement NP, as shown in (i):

(i)
```
+-                           -+    +-                              -+
|HEAD verb VFROM bse         |     |HEAD verb VFORM pas            |
|    +-                 -+   |     |    +-                    -+   |
|VAL|SUBJ <NP::[1]>      |   | →   |VAL|SUBJ <NP::[2]>         |   |
|   |COMPS <...NP::[2]...>|  |     |   |COMPS <...PP[uyhay]::[1]...>| |
+-  +-                 -++   |     +-  +-                    -++   |
```

(7)

```
NP::[1]  NP::[2]      NP::[3]                                      S
  |        |         /\
nay-ka  Mary-hanthey  ku cengchayk-ul

                    [4]V                    [5]V
              +-                -+    +-                          -+
              |SUBJ<NP[str]::[2]> |    |SUBJ<NP[str]::[1]>          |
              |COMPS<NP[str]::[3]>|    |COMPS/NP[dat]::[2],[4]V,\  |
              +-                -+    |     \NP[str]::[3]      /  |
                    |                  +-                          -+
              sihaynghalako                   |
                                          cisihayssta
```
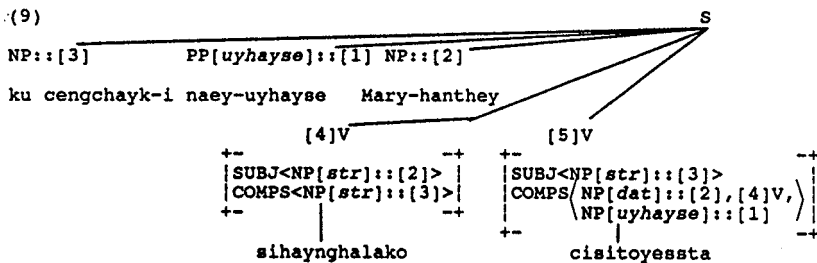
The application of the passive lexical rule in (6) to the head verb, [5]V in (7), gives (8) as output:

(8)

```
     +-                                                  -+
[5]V| SUBJ <NP[str]::[3]>                                 |
    | COMPS <NP[dat]::[2], [4]V, PP[uyhayse]::[1]>        |
     +-                                                  -+
```
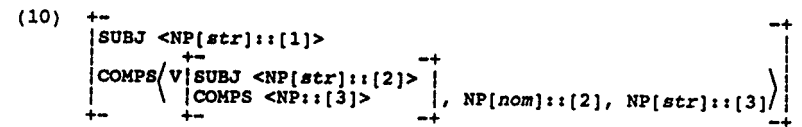
Then, the lexical entry in (8) licenses the passivized sentence in (1b) as follows:

(9)

```
NP::[3]        PP[uyhayse]::[1] NP::[2]                          S
ku cengchayk-i naey-uyhayse    Mary-hanthey
                    [4]V                    [5]V
              +-                -+    +-                          -+
              |SUBJ<NP[str]::[2]> |    |SUBJ<NP[str]::[3]>          |
              |COMPS<NP[str]::[3]>|    |COMPS/NP[dat]::[2],[4]V,\  |
              +-                -+    |     \NP[uyhayse]::[1] /  |
                    |                  +-                          -+
              sihaynghalako                   |
                                          cisitoyessta
```
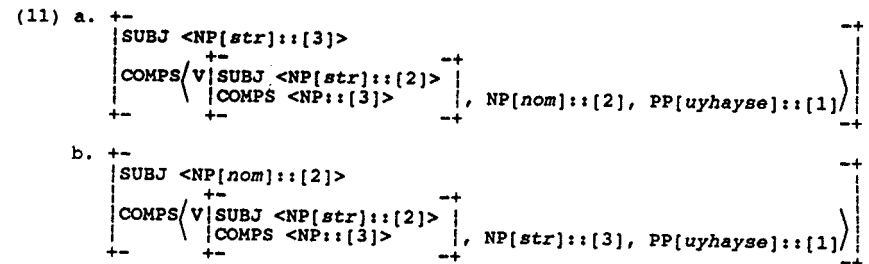
In our theory, examples such as (4) and (5) can also be accounted for by the passive rule in (6). That is, the subject of the embedded verb is also attracted to the

COMPS list of the matrix verb (i.e., the embedded subject NP is a complement NP in the matrix verb in the output entry of the attraction lexical rule in (81) in section 4.4 in chapter 4), and thus the matrix verb feeds the passive rule. Let us consider the sentence in (4) for example. (10) is the lexical entry for the matrix verb *sayngkakha* 'think', which corresponds to output of the attraction rule.

(10)

```
     +-                                                          -+
     |SUBJ <NP[str]::[1]>                                         |
     |       +-                -+                                 |
     |COMPS/V|SUBJ <NP[str]::[2]> |                             \ |
     |       |COMPS <NP::[3]>     |, NP[nom]::[2], NP[str]::[3]/  |
     |       +-                -+                                 |
     +-                                                          -+
```

The entry in (10) feeds the passive rule in (6), and its output can be either (11a) or (11b), since either complement NP can be the subject of the passive verb:

(11) a.
```
     +-                                                              -+
     |SUBJ <NP[str]::[3]>                                             |
     |       +-                -+                                     |
     |COMPS/V|SUBJ <NP[str]::[2]> |                                 \ |
     |       |COMPS <NP::[3]>     |, NP[nom]::[2], PP[uyhayse]::[1]/  |
     |       +-                -+                                     |
     +-                                                              -+
```

b.
```
     +-                                                              -+
     |SUBJ <NP[nom]::[2]>                                             |
     |       +-                -+                                     |
     |COMPS/V|SUBJ <NP[str]::[2]> |                                 \ |
     |       |COMPS <NP::[3]>     |, NP[str]::[3], PP[uyhayse]::[1]/  |
     |       +-                -+                                     |
     +-                                                              -+
```

(11a) licenses the sentences such as (2b) and (3b), while (11b) licenses sentences such as (4) and (5).

Nagai (1991) proposes that the subject of a long-distance passive sentence in Japanese (non-ECM complex passive in terms of Nagai (1991)) is not a real passivized

matter whether involved scrambling is clause-internal or clause-external.

This kind of data shows that long-distance scrambling in Korean cannot be treated the same as long-distance scrambling in Hindi, because long-distance scrambling in Hindi does not ameliorate the WCO effect (e.g., (20b)), while clause-internal scrambling does (e.g., (20a)) (Mahajan (1989)). The examples in (20) below are cited from Saito (1992):[3]

(20)   a. kis-ko$_i$ uskii$_i$ bahin   pyaar kartii hE.
          who   his sister   loves
          'Who$_i$, his$_i$ sister loves t$_i$.

      b. * kis-ko$_i$ uskii$_i$ bahin-ne   socaa   [ki   raam-ne t$_i$
          who   his sister   thought   that   Ram
          dekhaa   thaa].
          seen   be-past
          'Who$_i$, his$_i$ sister thought that Ram had seen t$_i$.

If we consider the possibility of amelioration of WCO effects to be diagnostic of different kinds of dislocation, we may say that long-distance scrambling and clause-internal scrambling in Korean are not distinctive. Then there is no reason to assume another scrambled position or mechanism such as A-bar movement in GB or SLASH feature percolation in GPSG/HPSG for long-distance scrambling. In our theory, this lack of distinction between long-distance and clause-internal scrambling is captured since we analyze both to be licensed by the same flat structure.

---

[3]In our theory, long-distance scrambling in Hindi is treated as a "real" unbounded dependency construction, as English-style topicalization, which is licensed by the SLASH mechanism in HPSG or A-bar movement in GB.

5.1.3. Licensing of Negative Polarity Items

The third kind of prediction that our theory makes concerns licensing negative polarity items (NPIs). According to Choe (1987) and Yoon (1994), an NPI such as *amwuto* 'anyone' or *amwukesto* 'anything' must be a clausemate of its licensor, a negative morpheme such as the negative auxiliary verb *ahn* 'do not'. Otherwise a sentence including an NPI is unacceptable, as shown in (21):

(21)   a. Mary-ka amwuto   mannaci anhassta.
          M-Nom   anyone   meet   did not
          'Mary did not meet anyone.'

      b. * Mary-ka amwuto   mannassta.
          M-Nom   anyone   met
          Lit. 'Mary met anyone.'

      c. ?(?) Na-nun [$_S$ Mary-ka amwuto   mannasstako] sayngkakhaci
           I-Top   M-Nom   anyone   met   think
          anhassta.
          did not
          'I did not think Mary met anyone.'

For some speakers, including the author, (21c) is slightly marginal but quite acceptable. Our argument in this section may not be convincing for those speakers.

An interesting fact about the distribution of NPIs is that long-distance scrambling or afterthought expression of an NPI can ameliorate a violation of the clausemate constraint, as shown in (22a,b), which are variations of (21c). See Suh (1990) and Lee (1994) for similar observations.

(22) a. Amwuto   na-nun   Mary-ka   mannasstako   sayngkakhaci   anhassta.
       anyone   I-Top   M-Nom   met   think   did not

   'I did not think Mary met anyone.'

   b. Na-nun   Mary-ka   mannasstako   sayngkakhaci   anhassta.   amwuto
      I-Top   M-Nom   met   think   did not   anyone

Moreover, even in a sentence with canonical word order such as (21c), the violation of the clausemate constraint can be ameliorated through a short pause and stress on *amwuto*, as shown in (23):

(23) (?)   Na-nun   Mary-ka   AMWUTO,   mannasstako   sayngkakhaci   anhassta.
            I-Top   M-Nom   anyone   met   think   did not
            'I did not think Mary met anyone.'

For those speakers to whom (21c) is already acceptable, there may be no contrast between (21c) on the one hand and (22) and (23) on the other. However, the point here is that even for those who do not accept (21c), it is much improved when the NPI scrambles or extracts out of the embedded clause, or when a pause is given after the NPI, as shown in (22) and (23).

However, the amelioration does not always occur. For example, when an NPI appears within a sentential subject or an adjunct, the amelioration does not occur, as shown in (24) and (25), respectively:

(24) a. * [s Mary-ka   amwuto   mannasstanun kes]-i
           M-Nom   anyone   met   COMP-Nom
           palkhyecici   anhassta.
           become-known   did-not

   Lit.'That Mary met anyone did not become known.'

   b. * [s AMWUTO,   Mary-ka   mannasstanun kes]-i
           anyone   M-Nom   met   COMP-Nom
           palkhyecici   anhassta.
           become-known   did-not

(25) a. * [s Mary-ka   amwuto   manako   siphehaki   ttaymwuney]
           M-Nom   anyone   meet   want   because
           party-ey   teylyekaci   anhassta.
           party-to   take   did not

   Lit. '(I) did not take (Mary) to the party because she wants to meet anyone.'

   b. * [s AMWUTO,   Mary-ka   manako   siphehaki   ttaymwuney]
           anyone   M-Nom   meet   want   because
           party-ey   teylyekaci   anhassta.
           party-to   take   did not

Our account of long-distance scrambling through the valence attraction mechanism naturally predicts the above facts if we reinterpret the clausemate constraint as follows:

(26)   An NPI must be a dependent (an argument or adjunct) of its licensor.[4]

Sentence (22a), where the NPI object of the embedded verb scrambles into the sentence-

---

[4]Here the notion of NPI licensor includes not only predicates including an explicit negation morpheme but also ones with an inherently negative meaning, such as *molunta* 'do not know', *himtulta* 'be difficult' *epsta* 'not exist', etc. See Kim (1995) for more discussion of this matter.

subject. He claims that the subject is a base-generated "major subject" (a kind of nominative topic in Chinese-style topicalization) since the long-distance passive in Japanese shares the following properties with the major subject construction:

(12) a. An oblique complement such as PP also can be the subject of the long-distance passive.

 b. The gap in the complement can be realized as a resumptive pronoun.

 c. The long-distance passive is possible out of complex NPs.

 d. The subject of the long-distance passive does not have to bind any element.

However, we cannot apply Nagai's analysis to Korean long-distance passive because it does not have any of the properties in (12), i.e., if Nagai's analysis is adopted for Korean, it will overgenerate the Korean counterparts such as (13b), (14), (15b) and (16b):

(13) (as for (12a))

 a. Motun salam-i   [s John-i   Mary-wa kyelhonhaysstako]
    all people-Nom   J-Nom   M-with married
    sayngkakhayssta.
    thought

    'All people thought that John married Mary.'

 b. * Mary-ka   motun salam-eyuyhayse John-i   kyelhonhaysstako
       M-Nom   all people-by   J-Nom   married
       sayngkak-toy-essta.
       thought-Pass-Past

    Lit. 'Mary was thought by all people that John married.' (It was thought by all people that John married Mary.')

(14) (as for (12b))

 a. * Ku cengchayk-i   naey-uyhayse Mary-hanthey   kukes-ul sihaynghalako
       the policy-Nom   I-by   M-to   it-Acc   carry out
       cisi-toy-essta.
       order-Pass-Past
    Lit. 'The policy was ordered by me to Mary to carry out.' (It was ordered by me to Mary to carry out the policy.)

 b. ?? Ku cengchayk-i   motun salamey-uyhayse cengpwu-ka
        the policy-Nom   all people-by   government-Nom
        kukes-ul sihaynghalilako   sayngkak-toy-essta.
        it-Acc   will carry out   think-Pass-Past
    Lit. 'The policy was thought by all people that the government would carry out.' (It was thought by all people that the government would carry out the policy.)

(15) (as for (12c))

 a. Motun salam-i   [s [NP [s ku yenghwa-lul   mantun] kamtok]-i
    all people-Nom   the movie-Acc   direct director-Nom
    kwukesstako sayngkakhayssta.
    died   thought
    'All people thought that the director who made the movie died.'

 b. * Ku yenghwa-ka   motun salam-eyuyhayse [s [NP [s ___   mantun]
       the movie-Nom   all people-by   direct
       kamtok]-i   kwukesstako sayngkak-toy-essta.
       director-Nom died   think-Pass-Past
    Lit. 'The movie was thought by all people that the director who made it died.'

(16) (as for (12d))

    a. Kyungchal-i [$_S$ John-i   Mary-lul cwukyesstako]   sayngkakhayssta.
       police-Nom   J-Nom   M-Acc   killed   suspected
       'The police thought that John killed Mary.'

    b. * Robin-i   kyungchal-eyuyhayse   [$_S$ John-i   Mary-lul
       Robin-Nom   police-by   J-Nom   M-Acc
       cwukyesstako]   sayngkak-toy-essta.
       killed   thought
       Lit. 'It is Robin who was thought by the police that John killed Mary.' (It
       affected Robin that John was thought by the police to kill Mary.)

5.1.2. Amelioration of Weak Crossover Effects

Our unified account of long-distance scrambling and clause-internal scrambling through

the flat analysis also predicts some facts about the so-called weak crossover (WCO)

effect. (See section 2.1.8 in chapter 2 for our theory of WCO effects.) In Korean, clause-

internal scrambling ameliorates WCO effects as shown in (17):

(17)   a. * [Caki$_i$-/ku$_i$-uy/pro$_i$ emma-ka]   nwukwu$_i$-lul salangha-ni?
           self-/he-Gen/pro   mother-Nom who-Acc   love-Q

          'Who$_i$ does his$_i$ mother love.'

    b. Nwukwu$_i$-ul   [caki$_i$-/ku$_i$-uy/pro$_i$ emma-ka]   salangha-ni?
       who-Acc   self-/he-Gen/pro mother-Nom   love-Q

In (17a), the operator *nwukwu-lul* 'who' neither properly o-commands nor properly

precedes the NP dominating a pronoun coindexed with the operator, which induces WCO

effects. In contrast, in (17b), the operator properly precedes the NP dominating a

pronoun, and thus the WCO effect is ameliorated.

In Korean and Japanese, the amelioration of the WCO effect also occurs through

long-distance scrambling (Saito (1992), Yoshimura (1989), and Cho (1994)), as shown

in (18) and (19):

(18)   a. * [Caki$_i$-/ku$_i$-uy/pro$_i$ emma-ka] [$_S$ Mary-ka nwukwu$_i$-lul
           self-/he-Gen/pro   mother-Nom M-Nom who-Acc
           ttaylyesstako] sayngkakha-ni?
           hit   think-Q

          Lit. 'Who$_i$ did his$_i$ mother think Mary hit .'

    b. Nwukwu$_i$-ul [$^{(?)}$caki$_i$-/ku$_i$-uy/pro$_i$ emma-ka]   Mary-ka ttaylyesstako
       who-Acc   self-/he-Gen/pro mother-Nom M-Nom   hit
       sayngkakha-ni?
       think-Q

(19)   a. * [Caki$_i$-/ku$_i$-uy/pro$_i$ emma-ka] [$_S$ Mary-ka nwukwunka$_i$-lul
           self-/he-Gen/pro   mother-Nom M-Nom someone-Acc
           ttaylyesstako]   sayngkakhanta.
           hit   think-Q

          Lit. 'His$_i$ mother thinks Mary hit someone$_i$.'

    b. Nwukwunka$_i$-lul [$^{(?)}$caki$_i$-/ku$_i$-uy/$^{(?)}$pro$_i$ emma-ka]   Mary-ka
       someone-Acc   self-/he-Gen/pro   mother-Nom M-Nom
       ttaylyesstako sayngkakhanta.
       hit   think

In the (a) sentences, the operator *nwukwu-lul* 'who' or *nwukwunka-lul* 'someone'

neither properly o-commands nor properly precedes the NP dominating the pronoun,

which induces WCO effects. In contrast, in (b) sentences, the operator properly precedes

the NP dominating the pronoun, and thus the WCO effect is ameliorated. This

observation shows that in Korean, the WCO effect is ameliorated by scrambling, no

initial position, is predicted to be acceptable, because the NPI is attracted to the COMPS list of the matrix complex verb *sayngkakhaci anhassta* 'did not think', which includes a negation auxiliary head verb. That is, the NPI is an argument of the matrix verb of negation, and thus (26) is satisfied. (22b) is also predicted to be acceptable since in our analysis, the NPI can be licensed as an afterthought expression only when it is an argument of the matrix verb *sayngkakhaci anhassta*, which is *v-indiv-word*. (See section 4.4.3.1 in chapter 4 for discussion about afterthought expressions.)

The flat structure version of (21c), where the word order is the same as (21c) but the embedded S boundary is eliminated, would seem to be problematic. In this structure, the NPI is attracted to the matrix verb of negation and becomes an argument of the verb. Then the condition in (26) is satisfied, and hence the sentence is incorrectly predicted to be acceptable. On our approach, the flattened version of (21c) is awkward due to some processing factor. That is, as mentioned in chapter 4, in Korean a nominative NP and the nearest verb tend to be interpreted as one clause (the Interpretive Principle). Because of this processing factor, *Mary-ka amwuto mannasstako* (Lit. 'Mary met anyone') is interpreted as one interpretive unit, a clause, which is unacceptable, as shown in (21b). The claim that the flattened version of (21c) involves a processing factor is supported by the sentence in (23). As shown in (23), the sentence becomes much better if we put a short pause between the NPI and the embedded verb. Here the pause plays the role of blocking the proccesing interference by phonologically separating the NPI from the embedded verb and thus preventing *Mary-ka amwuto mannasstako* from being interpreted

as a unit.[5]

The sentences in (24) and (25) are correctly predicted to be unacceptable because in our theory, the NPI there cannot be attracted to the matrix verb of negation, (argument attraction is impossible out of a subject or adjunct), and thus the constraint in (26) is not satisfied.

5.4. Long-Distance Anaphor Binding

The fourth prediction of our valence attraction approach to long-distance scrambling is that it can consistently account for some facts about anaphor binding. In section 2.1.6 in chapter 2, we discussed syntactic binding conditions on locally bound *caki* (principle A), and the effect of scrambling on it. In this section, we will extend the syntactic binding principle in section 2.1.6, showing how our valence attraction approach can account for the effect of long-distance scrambling on so-called long-distance anaphor binding. We will also suggest how principles B and C can be accordingly reformulated in our binding theory.

---

[5]In our theory, the disagreement on the sentence in (21c) implies that some speakers overcome the effect of the interpretive principle more easily than others, regarding NPI licensing. I.e., some speakers can accommodate the principle without a pause or stress. Alternatively, the clause mate constraint in (26) may not exist for those speakers.

5.4.1. Long-Distance *Caki*-Binding

Let us consider the examples in (27):

(27) a. Nwu$_i$-ka [$_S$ Mary-ka caki$_i$-lul pinanahaysstako] sayngkakha-ni?
       who-Nom   M-Nom   self-Acc criticized   think-Q
       'Who$_i$ thinks that Mary criticized him$_i$?'

      b. Nwu-ka [$_S$ Mary$_j$-ka caki$_j$-lul pinanahaysstako] sayngkakha-ni?
         who-Nom   M-Nom   self-Acc criticized   think-Q
         'Who thinks that Mary$_j$ criticized herself$_j$?'

In (27), *caki-lul* within the embedded clause can be coindexed with the matrix subject *nwu-ka* 'who' ((27a)) or the embedded subject *Mary-ka* ((27b)). (27a) is an instance of a non-locally bound anaphor, in that the binder and *caki* are not coarguments. This kind of long-distance anaphor binding usually occurs when the binder is the matrix subject. However, it is also possible even when the binder is a matrix secondary object (SO), as shown in (28):

(28) a. Ne-nun   nwukwu$_i$-hanthey   [$_S$ Mary-ka caki$_i$-lul pinanhaysstako]
          you-Top who-to   M-Nom   self-Acc criticized
          malhay-cwuess-ni?
          tell-did-as-a-favor-for-Q
          'Whom$_i$ did you tell that Mary criticized him$_i$?'

      b. Ne-nun   nwukwu-hanthey [$_S$ Mary$_j$-ka caki$_j$-lul pinanhaysstako]
         you-Top who-to   M-Nom   self-Acc criticized
         malhay-cwuess-ni?
         tell-did-as-a-favor-for-Q
         'Whom did you tell that Mary$_j$ criticized herself$_j$?'

In (27) and (28), scrambling of *caki* out of the embedded clause can change acceptability, as given in (29) and (30):

(29) a. Caki$_i$-lul nwu$_i$-ka Mary-ka   pinanahaysstako sayngkakha-ni?
          self-Acc who-Nom M-Nom   criticized   think-Q
          'Who$_i$ thinks that Mary criticized him$_i$?'

      b. * Caki$_i$-lul nwu-ka Mary$_j$-ka   pinanahaysstako sayngkakha-ni?
           self-Acc who-Nom M-Nom   criticized   think-Q
           'Who thinks that Mary$_j$ criticized herself$_j$?'

(30) a. * Caki$_i$-lul ne-nun   nwukwu$_i$-hanthey   Mary-ka
           self-Acc you-Top who-to   M-Nom
           pinanhaysstako   malhay-cwuess-ni?
           criticized   tell-did-as-a-favor-for-Q
           'Whom$_i$ did you tell that Mary criticized him$_i$?'

      b. (?) Caki$_j$-lul ne-nun   nwukwu-hanthey Mary$_j$-ka   pinanhaysstako
             self-Acc you-Top who-to   M-Nom   criticized
             malhay-cwuess-ni?
             tell-did-as-a-favor-for-Q
             'Whom did you tell that Mary$_j$ criticized herself$_j$?'

In (29), one reading is possible where *caki* and the matrix subject *nwu-ka* 'who' are coindexed ((29a)), while the other reading where *caki* and the embedded subject *Mary-ka* are coindexed is not possible ((29b)). (See Choe (1987) for the same observation.) The unacceptability of the latter case seems to be due to an intervention effect, rather than a syntactic factor, because if we replace the matrix subject with the first person *nay-ka* 'I', which is not a possible *caki* binder in Korean, then the intended reading is acceptable,

as shown in (31):[6]

(31) Caki$_j$-lul nay-ka   Mary$_j$-ka   pinanahaysstako . sayngkakhanta.
      self-Acc   I-Nom   M-Nom   criticized   think
      'I think that Mary$_j$ criticized herself$_j$.'

In (30), one reading is possible where *caki* and the embedded subject *Mary-ka* are coindexed (e.g., (30b)), while the other reading where *caki* and the matrix SO *nwukwu-hanthey* 'to whom' are coindexed ((30a)) is impossible.[7] One might assume that the unacceptability of (30a) is also caused by an intervention effect due to the third person embedded subject *Mary-ka*. However, this cannot be the case because the reading is still impossible even if we replace the embedded subject *Mary-ka* with *nay-ka* 'I', as shown in (32):

(32) a. * Caki$_i$-lul ne-nun   nwukwu$_i$-hanthey   nay-ka
              self-Acc   you-Top   who-to   I-Nom
              pinanhaysstako   malhay-cwuess-ni?
              criticized   tell-did-as-a-favor-for-Q
              'Whom$_i$ did you tell that I criticized him$_i$?'

---

[6]See section 2.1.7.2 in chapter 2 for discussion of intervention effects, especially below example (83) and footnote 14 there. Note that, as shown in (27a), this intervention effect does not occur when scrambling does not occur. A similar observation is also made in footnote 8 in this section. Presently, it is not clear why the effect occurs only in scrambled cases. We leave this for further study.

[7]The reading of (30b) where *caki* and *Mary-ka* are coindexed is not as good as the (29a) counterpart. As mentioned in section 4.2 in chapter 4, this acceptability degradation has nothing to do with *caki* binding itself because the same degradation is also found in sentences where *caki* binding is not involved.

      b. * Ne-nun   Caki$_i$-lul   nwukwu$_i$-hanthey nay-ka
              you-Top self-Acc   who-to   I-Nom
              pinanhaysstako   malhay-cwuess-ni?
              criticized   tell-did-as-a-favor-for-Q

When the binder *nwukwu-hanthey* 'to whom' precedes *caki*, however, the acceptability is much improved, as shown in (33):

(33) Nwukwu$_i$-hanthey   caki$_i$-lul   ne-nun   nay-ka   pinanhaysstako
      who-to   self-Acc   you-Top   I-Nom   criticized
      malhay-cwuess-ni?
      tell-did-as-a-favor-for-Q
      'Whom$_i$ did you tell that I criticized him$_i$?'

All the unacceptable sentences in (30) and (32) contain an (embedded) complement *caki* which linearly precedes the (matrix) complement antecedent. In contrast, the acceptable sentence in (33) contains an (embedded) *caki* complement which linearly follows the (matrix) complement antecedent. Here we put the terms such as "embedded" and "matrix" within parentheses because in our theory of long-distance scrambling, such a distinction does not exist: embedded complements and matrix complements are both coarguments of the matrix verb due to valence attraction.

It is important to note that the same pattern was also found in section 2.1.6 in chapter 2 where we discussed binding of locally bound *caki*, where *caki* is bound by a genuine (non-attracted) coargument. The relevant examples are repeated below:

(34) a. Nay-ka   silswu-lo   Mary$_i$-lul caki$_i$-hanthey sokayhayssta.
I-Nom   by-mistake   M-Acc   self-to   introduced
'I introduced Mary$_i$ to herself$_i$ by mistake.'

b. * Caki$_i$-hanthey nay-ka   silswu-lo   Mary$_i$-lul sokayhayssta.
self-to   I-Nom   by-mistake   M-Acc   introduced
'I introduced Mary$_i$ to herself$_i$ by mistake.'

c. Nay-ka   silswu-lo   Mary$_i$-hanthey   caki$_i$-lul   sokayhayssta.
I-Nom   by-mistake   M-to   self-Acc   introduced
Lit. 'I introduced herself$_i$ to Mary$_i$ by mistake.'

d. * Caki$_i$-lul   nay-ka silswu-lo   Mary$_i$-hanthey   sokayhayssta.
self-Acc   I-Nom by-mistake   M-to   introduced
Lit. 'I introduced herself$_i$ to Mary$_i$ by mistake.'

Here, the sentences are acceptable when the complement *caki* follows its complement binder, while the sentences are unacceptable when the complement *caki* precedes its complement binder.

The acceptable sentences in (29a), (30b) and (31) have the same pattern, in that *caki* there can precede or follow its binder, which is a (matrix or embedded) subject. This pattern was also found in section 2.1.6 where we discussed *caki* bound by a genuine (non-attracted) coargument subject. The relevant example are repeated below:

(35) a. Ku namca$_i$-ka caki$_i$-hanthey phyenci-lul   ssessta.
the man-Nom self-to   letter-Acc   wrote

'The man$_i$ wrote a letter to himself$_i$.'

b. Caki$_i$-hanthey ku namca$_i$-ka phyenci-lul   ssessta.
self-to   the man-Nom letter-Acc   wrote

The descriptive generalization from the above observations is as follows. Regardless of whether *caki* and its antecedent are arguments of one verb or separate verbs, they are subject to the same *caki* binding condition in a scrambling environment, i.e., when a subject is an antecedent, binding is possible regardless of linear order between *caki* and its antecedent (e.g., (29a), (30b), (31) and (35)), whereas when both an antecedent and *caki* are complements, *caki* must follow its antecedent (e.g., (30a), (32), (33) and (34)). These non-distinctive *caki* binding possibilities among arguments in a simplex clause or a complex clause are predicted by our theory. The arguments of the embedded verb can be attracted to the matrix verb, which makes the arguments of the embedded and matrix verbs coarguments of the matrix verb. This coargumenthood of the embedded and matrix arguments leads to a prediction that they are subject to the same syntactic *caki* binding condition. In our theory, this generalization can be captured if we assume that the attracted *caki* as well as the non-attracted *caki* must satisfy principle A suggested in section 2.1.6.

Before we show how principle A applies, let us revise the obliqueness hierarchy in (36) suggested in section 2.1.6, to the form given in (37) in order to handle binding involving verbal complements such as S-, VP- and V-complements.

(36)   Subject < Complements < ...

(37)   Subject < Non-Verbal Complements < Verbal Complement ...

(37) states (i) that a subject is less oblique than complements; (ii) that a non-verbal

complement such as PO or SO is less oblique than a verbal complement; and (iii) that all non-verbal complements are equally oblique. Clauses (i) and (ii) above can account for the fact that the matrix subject or matrix SO can bind *caki* within an S-complement regardless of the position of the subject or SO with respect to the S-complement:[8]

(38) a. Nwu$_i$-ka [$_S$ nay-ka caki$_i$-lul pinanahaysstako]   sayngkakha-ni?
       who-Nom   I-Nom self-Acc criticized   think-Q

   'Who$_i$ thinks that I criticized him$_i$?'

   b. [$_S$ Nay-ka   caki$_i$-lul   pinanahaysstako] nwu$_i$-ka   sayngkakha-ni?
        I-Nom   self-Acc   criticized   who-Nom think-Q

(39) a. Ne-nun   nwukwu$_i$-hanthey   [$_S$ nay-ka   caki$_i$-lul   pinanhaysstako]
       you-Top   who-to   I-Nom   self-Acc   criticized
       malhay-cwuess-ni?
       tell-did-as-a-favor-for-Q

   'Whom$_i$ did you tell that I criticized him$_i$?'

---

[8]There is an intervention effect in the (b) sentences. For example, if we replace the embedded subject *nay-ka* 'I' with the third person *Mary-ka*, then it is hard to get the intended binding, as shown below:

(i)   ?? [$_S$ Mary-ka caki$_i$-lul   pinanahaysstako] nwu$_i$-ka   sayngkakha-ni?
        M-Nom   self-Acc   criticized   who-Nom think-Q
       'Who$_i$ thinks that Mary criticized him$_i$?'

(ii) ??/* Ne-nun   [$_S$ Mary-ka caki$_i$-lul   pinanhaysstako] nwukwu$_i$-hanthey
           you-Top   M-Nom   self-Acc   criticized   who-to
           malhay-cwuess-ni?
           tell-do-as-a-favor-for-Q
       'To whom$_i$ did you tell that Mary criticized him$_i$?'

   b. (?) Ne-nun   [$_S$ nay-ka   caki$_i$-lul   pinanhaysstako] nwukwu$_i$-hanthey
        you-Top   I-Nom   self-Acc   criticized   who-to
        malhay-cwuess-ni?
        tell-did-as-a-favor-for-Q

The definitions of local p-command, local p-bind and principle A suggested in section 2.1.6 are repeated below:

(40)   Local P-Command: X locally *p-commands* Y iff

   either (i) X locally o-commands Y,

   or   (ii) X and Y are equally oblique and X precedes Y.

(41)   X *locally p-binds* Y iff X and Y are coindexed and X locally p-commands Y.

(42)   The Binding Condition of Locally Bound *Caki* (Principle A):

   Locally p-commanded *caki* must be locally p-bound.

On our approach, non-locally bound anaphors are considered to be a pronoun, namely an x-pronoun, which is subject to the variable binding condition suggested in section 2.1.7.2 in chapter 2, when the binder is an operator. The condition is repeated in (43):

(43) Variable binding condition of *x-pronoun*:

An x-pronoun X may be bound by an operator O only if

either (i) O properly o-commands X

or (ii) O-complex properly precedes X.

Based on these definitions, let us reconsider all the given facts one by one. In (27a) where the S-complement is not flattened, *caki* is not locally bound. This entails that the binding possibilities are determined by the variable binding condition in (43). Here, the binder *nwu-ka* properly o-commands *caki*, and thus (27a) is predicted to be acceptable. The sentences in (28a), (38) and (39) are predicted to be acceptable for exactly the same reason. For example, in (28a), where the S-complement is not flattened, *caki* is a non-locally bound anaphor too. Due to the obliqueness hierarchy in (37), the matrix SO *nwukwu-hanthey* o-commands *caki-lul*, and thus (28a) satisfies condition (43). The sentences in (38) and (39) are also predicted to be acceptable for the same reason.

In (27b) where the S-complement is not flattened, *caki* is a locally bound anaphor, which entails that the binding possibilities are determined by principle A in (42). Here *Mary-ka* locally p-commands *caki-lul*, and thus (42) is satisfied. (28b) is acceptable for exactly the same reason.

The structure of the sentence in (29a) is as in (44b), where the S-complement is flattened, and *caki-lul* precedes the binder *nwu-ka*:

(44) a. Caki$_i$-lul nwu$_i$-ka Mary-ka   pinanahaysstako sayngkakha-ni?
           self-Acc who-Nom M-Nom   criticized   think-Q
           'Who$_i$ thinks that Mary criticized him$_i$?'

b.
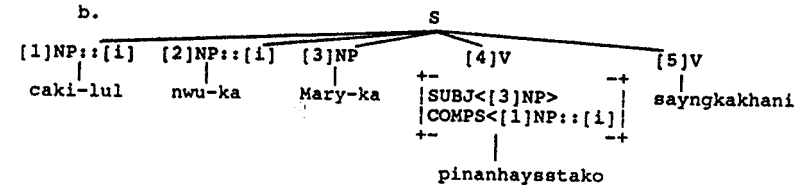
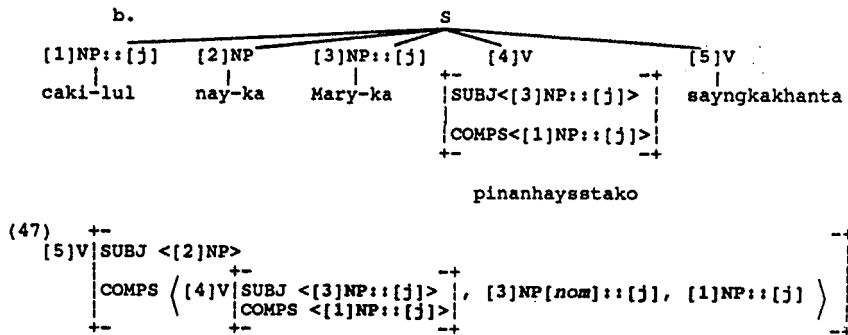The matrix verb [5]V in (44b) has the following structure:

(45)

In (45), the attracted anaphor *caki*, [1]NP in [5]V's COMPS list, is locally p-commanded by the binder [2]NP in [5]V's SUBJ list, and thus (29a) satisfies principle A in (42).

On our analysis, (29b) is predicted to be acceptable since the embedded subject *Mary-ka* locally o-commands the complement *caki-lul*. As mentioned already, however, this sentence is ruled out by an intervention effect. The example in (31) has exactly the same structure as (29b) except the matrix subject is in the first person. The structure for (31) is as in (46b), where the matrix verb [5]V has the structure in (47):

(46) a. Caki$_j$-lul nay-ka Mary$_j$-ka   pinanahaysstako sayngkakhanta.
           self-Acc I-Nom M-Nom   criticized   think
           'I think that Mary$_j$ criticized herself$_j$?'

b.

```
                              S
       ┌──────────┬──────────┬──────────┴────────┬──────────┐
   [1]NP::[j]   [2]NP      [3]NP::[j]          [4]V                [5]V
       |          |          |          +-              -+         |
   caki-lul    nay-ka     Mary-ka    |SUBJ<[3]NP::[j]> |      sayngkakhanta
                                     |                 |
                                     |COMPS<[1]NP::[j]>|
                                     +-              -+
```

pinanhaysstako

```
(47) +-
     [5]V|SUBJ <[2]NP>
         |        +-                    -+
         |COMPS  <[4]V|SUBJ <[3]NP::[j]> |, [3]NP[nom]::[j], [1]NP::[j] >
         |           |COMPS <[1]NP::[j]>|
     +-  +-                    -+                                       -+
```
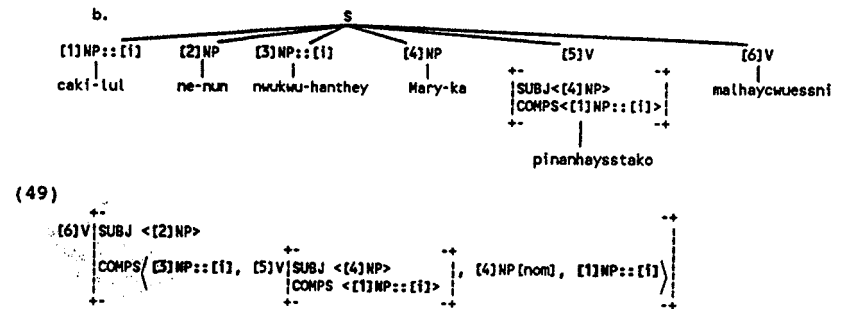
In (47), the non-attracted [1]NP in the [4]V's COMPS list satisfies principle A independently of linear order between the anaphor and its binder, because it is locally o-commanded by [3]NP in the [4]V's SUBJ list.

As for the attracted [3]NP and [1]NP in [5]V's COMPS list, the [1]NP is not locally p-commanded by [3]NP because they are equally oblique but the latter does not precede the former, as shown in (46a). In this case, [1]NP is an exempt anaphor (x-pronoun) and subject to the variable binding condition in (43). However, [1]NP does not satisfy this condition because [3]NP neither properly o-commands nor properly precedes [1]NP. Therefore, (46a) (=(29b)) is predicted to be unacceptable when *caki* is interpreted as an x-pronoun.

The structure for (30a) is as in (48b), whose matrix verb has the structure in (49):

(48) a. * Caki$_i$-lul   ne-nun   nwukwu$_i$-hanthey   Mary-ka
             self-Acc   you-Top   who-to   M-Nom
             pinanhaysstako   malhay-cwuess-ni?
             criticized   tell-did-as-a-favor-for-Q
             'Whom$_i$ did you tell that Mary criticized him$_i$?'

b.

```
                              S
       ┌──────────┬──────────┬──────────┬──────────┴──────────┐
   [1]NP::[i]  [2]NP    [3]NP::[i]    [4]NP              [5]V              [6]V
       |          |          |          |          +-                 -+    |
   caki-lul    ne-nun   nwukwu-hanthey Mary-ka   |SUBJ<[4]NP>         |  malhaycwuessni
                                                 |COMPS<[1]NP::[i]>  |
                                                 +-                 -+
                                                        |
                                                  pinanhaysstako
```

```
(49) +-
     [6]V|SUBJ <[2]NP>
         |        +-                                     -+
         |COMPS <[3]NP::[i], [5]V|SUBJ <[4]NP>         |, [4]NP[nom], [1]NP::[i]>
         |               |COMPS <[1]NP::[i]>|
     +-  +-                    +-          -+              -+
```

As for the attracted [1]NP in [6]V's COMPS list in (49), we can consider two possibilities. If the binder [3]NP precedes [1]NP, as in (33), [1]NP is locally p-commanded by [3]NP, and thus (49) satisfies principle A in (42). This correctly predicts the sentence in (33) to be acceptable, where the binder precedes the anaphor. However, if [1]NP precedes [3]NP instead, as in (48a) (=(30a)), [1]NP is not locally p-commanded by [3]NP, and hence [1]NP is not locally p-commanded. In this case, the [1]NP must be an x-pronoun, which is an exempt anaphor. In this interpretation of [1]NP, (48a) cannot be acceptable since it does not satisfy the variable binding condition, i.e., the binder [3]NP and the exempt [1]NP are equally oblique, and [3]NP does not precede [1]NP. Thus [3]NP neither properly o-commands nor properly precedes [1]NP. The sentences in (32) are also correctly predicted to be unacceptable for the same reason.

So far we have discussed only the cases where *caki* is not an embedded subject. Now let us consider the case where *caki* is the embedded subject. Some examples are given in (50):

(50) a. (?) Ne-nun   nwukwu$_i$-hanthey [$_S$ caki$_i$-ka   ku il-ul
         you-Top   who-to   self-Nom the job-Acc
         hayya-haysstako] malhay-cwuess-ni?
         do-had-to   tell-did-as-a-favor-for-Q

      'Whom$_i$ did you tell that he$_i$ must do the job?'

   b. (?) Ku il-ul   ne-nun   nwukwu$_i$-hanthey caki$_i$-ka   hayya-haysstako
         the job-Acc   you-Top   who-to   self-Nom do-had-to
         malhay-cwuess-ni?
         tell-did-as-a-favor-for-Q

The sentences in (50) are marginal but acceptable to most speakers. In (50a), where

scrambling does not occur, *caki-ka* is not locally p-commanded and thus an x-pronoun.

It satisfies the variable binding condition in (43), i.e., the binder *nwukwu-hanthey* 'to

whom' locally o-commands the S-complement and so o-command *caki-ka* within the S-

complement. The scrambled structure of (50b), whose matrix verb is as in (52), is as in

(51):

(51)

(52)
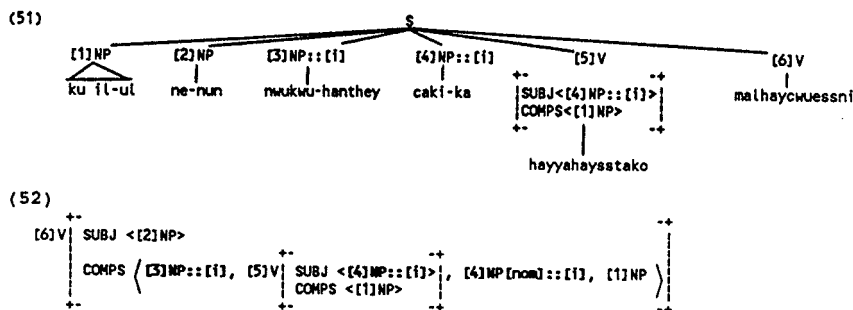
In (52), the attracted [4]NP in [6]V's SUBJ list is locally p-commanded by [3]NP since

---

[3]NP and [4]NP are equally oblique, and [3]NP precedes [4]NP, as shown in (50b).[9]

The reconstruction analysis in Saito (1992) has problems in accounting for the

effect of long-distance scrambling on anaphor binding. Examples such as (31) and (33)

can be accounted for by reconstruction, i.e., the scrambled anaphor *caki-lul* can be

reconstructed into the trace position at LF and c-commanded by the embedded subject.

However, a problem with this analysis arises from examples such as (30a) or (32). For

example, (30a) is incorrectly predicted to be acceptable since the scrambled anaphor can

also be reconstructed into the trace position and c-commanded by the matrix SO. A

crucial difference between (30a) and (31) is that the binder in (30a) is a matrix

complement, while the binder in (31) is an embedded subject. Thus, what really matters

here is the subjecthood or complementhood of the binder, i.e., a complement binder is

NOT prominent enough to bind a preceding anaphor, while a subject binder IS prominent

enough to bind a preceding anaphor.

5.4.2. Argument Structure and a Revision of Binding Theory

A potential problem for our theory seems to arise from the sentences in (53), where the

anaphor is a matrix complement while its binder is a embedded complement.

---

[9]Note that in sentences like (50b), the embedded subject with nominative case
cannot precede the binder because of an independently motivated constraint on subject
scrambling, which was discussed in section 4.4.2 in chapter 4.

(53) a. * Nay-ka   caki$_i$-hanthey [$_s$ motun salam-i   Mary$_i$-lul
     I-Nom   self-to   all people-Nom M-Acc
     salanghantako]   malhay-cwuessta.
   love   tell-did-as-a-favor-for

Lit.'I told herself$_i$ that all people loved Mary$_i$.'

b. * Mary$_i$-lul nay-ka caki$_i$-hanthey motun salam-i   salanghantako
     M-Acc   I-top   self-to   all people-Nom love
     malhaycwuessta.
     tell-did-as-a-favor-for

We can say that (53a), where the embedded S is not flattened, is ruled out by principle C proposed in chapter 2, repeated below:

(54) Principle C: A non-pronoun (npro) must not be p-bound by a pronominal (pron).

That is, according to the obliqueness hierarchy in (37), *caki-hanthey* in (53a) is less oblique than the S-complement, and thus *caki-hanthey* p-commands *Mary-lul*, which is dominated by the S node. But even though we have the same principle C violation effect in (53b), as in (53a), we cannot say that (53b) is also ruled out by principle C as presently formulated. To see why, let us consider the structure for (53b):
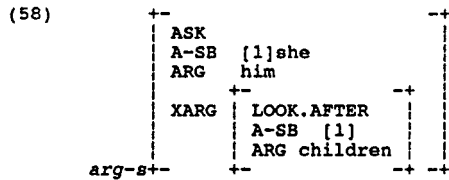
(55)
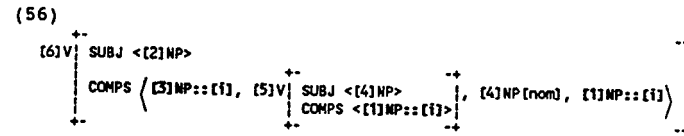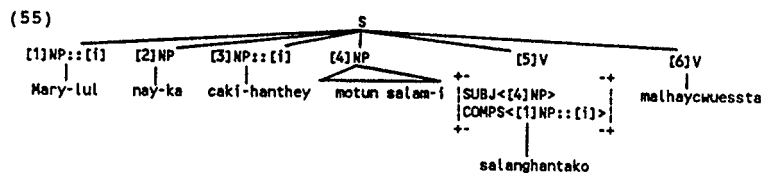
In (56), the attracted [1]NP locally p-commands the anaphor [3]NP because both [1]NP and [3]NP are equally oblique and [1]NP precedes the [3]NP, as shown in (53b). That is, (53b) satisfies principle A and is predicted to be acceptable. It cannot be an instance of a principle C violation because *caki-hanthey* does not p-command *Mary-lul*. In other words, the problem involved here is that principle C formulated as in (54) cannot be maintained as it is, due to the effect of valence attraction.

One way to avoid this problem is to assume that principle C applies at a level which differs from the level where principle A applies. According to previous discussions, it seems obvious that principle A is supposed to apply at VALENCE level, since it is affected by valence attraction. Even though it is not clear exactly at what level principle C is supposed to apply, it must be a level where valence attraction does not occur. To this end, we assume that there exists a certain level of representation which is similar to f-structure in LFG, where the original argument structure is maintained without being affected by syntactic operations such as move-α or valence attraction.

In this thesis, we will avoid exploring the exact nature of this level, or arguing for or against a specific version of this level, since it is far beyond the scope of this thesis. Rather, we will just assume one of the recent versions of this level suggested by Manning (1994) and Manning and Sag (1995). According to Manning (1994), the argument structure for the sentence in (57) is as in (58);
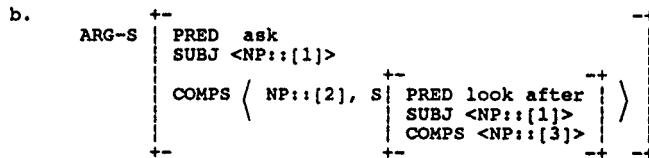
(56)

(57)   She asked him to look after children.

(58)
```
      +-                        -+
      | ASK                      |
      | A-SB  [1]she             |
      | ARG   him                |
      |       +-           -+    |
      | XARG  | LOOK.AFTER  |    |
      |       | A-SB  [1]   |    |
      |       | ARG children|    |
arg-s+-       +-           -+ -+
```

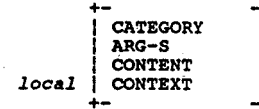In (58), A-SB, ARG and XARG stands for the agent subject, argument, and predicate argument, respectively.

We translate Manning's argument structure into the HPSG framework as shown in (59):

(59)   a.   She₁ asked him₂ to look after children₃.

    b.
```
          +-                                      -+
    ARG-S | PRED  ask                              |
          | SUBJ <NP::[1]>                         |
          |                +-                  -+  |
          | COMPS  ⟨ NP::[2], S| PRED look after |  ⟩ |
          |                | SUBJ <NP::[1]>    |  |
          |                | COMPS <NP::[3]>   |  |
          +-                +-                -+ -+
```

As mentioned above, the exact nature of the level of ARG-S is left for further study, and thus, we are not sure whether the ARG-S is the same object as the CONTENT level. Tentatively, we assume that the ARG-S exists independently of the CONTENT. In our theory, as discussed in chapter 1, the CONTENT level is used to represent the individual thematic roles of arguments such as KICKER and KICKED, and their thematic hierarchy. If this assumption is valid, then sort *local* is now assumed to contain four features as shown in (60):

(60)
```
             +-             -+
             | CATEGORY      |
             | ARG-S         |
             | CONTENT       |
      local  | CONTEXT       |
             +-             -+
```

Now we propose that principles B and C apply only at the ARG-S, since they are not affected by scrambling or valence attraction.[10] To this end, we subclassify the notion of local p-command into *local valence-p-command* (*local v-p-command*) and *local argument-p-command* (*local a-p-command*), depending on where the relative obliqueness among arguments is determined. That is, when the relative obliqueness is determined at VALENCE, it is called local v-p-command, and when it is determined at ARG-S, it is called local a-p-command. On this approach, local p-command is redefined as in (61).

(61)   Local P-Command: X locally p-commands Y at level L iff

        either   (i)   X locally o-commands Y at L

        or   (ii)   X and Y are equally oblique at L and the phonological realization of

                       X precedes phonological realization of Y.

Here phonological realization is defined as follows:

---

[10]According to Manning (1994), in general, binding theories apply at ARG-S. However, Korean anaphor binding must be an exception since principle A and variable binding are affected by scrambling and valence attraction, as discussed in the previous section and chapter 2.

(62)   For X a synsem object, the phonological realization of X is the PHON value of

a phonetically non-null sign with SYNSEM value X.

Based on the new version of local p-command, we can define local v-p-command as in

(63).

(63)   Local V-P-Command: X locally *v-p-commands* Y iff

X locally p-commands Y at VALENCE.

And our suggestion about replacing local p-command with local v-p-command would

entail change throughout:

(64)   Local V-P-Bind: X *locally v-p-binds* Y iff

X and Y are coindexed and X locally v-p-commands Y.

(65)   V-P-Command: X *v-p-commands* Y iff

X locally v-p-commands Z dominating (not necessarily properly) Y.

(66)   V-P-Bind: X *v-p-binds* Y iff

X and Y are coindexed and X v-p-commands Y.

By the same way, local a-p-command is defined in (67), and its related notions are

accordingly changed as in (68) through (70):

(67)   Local A-P-Command: X locally *a-p-commands* Y iff

X locally p-commands Y at ARG-S.

(68)   Local A-P-Bind: X *locally a-p-binds* Y iff

X and Y are coindexed and X locally a-p-commands Y.

(69)   A-P-Command: X *a-p-commands* Y iff

X locally a-p-commands Z containing (not necessarily properly) Y.

(70)   A-P-Bind: X *a-p-binds* Y iff
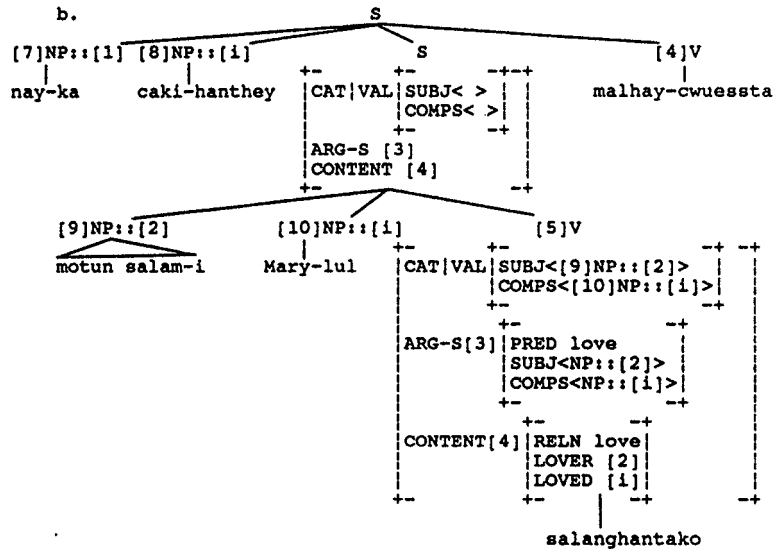
X and Y are coindexed and X a-p-commands Y.

Based on these definitions, we can reformulate principles A, B and C as follows:

(71)   Principle A: Locally v-p-commanded *caki* must be locally v-p-bound.

(72)   Principle B: A personal pronoun (ppro) must not be locally a-p-bound.

(73)   Principle C: A non-pronoun (npro) must not be a-p-bound by a pronominal (pron).
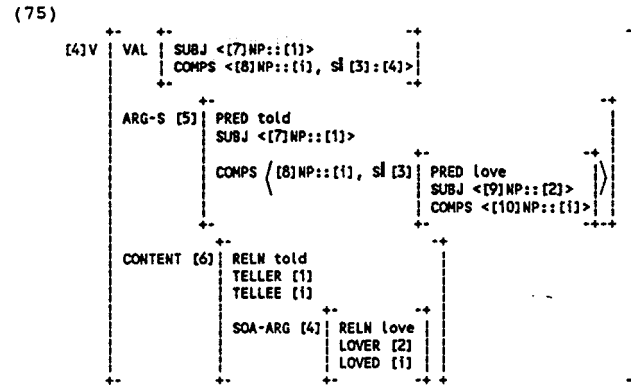
Principle A in (71) is formulated in terms of local v-p-command, and thus it applies only

at VALENCE. In contrast, principles B and C in (72) and (73) are formulated in terms

of (local) a-p-command, and thus they apply only at ARG-S.

On this approach, the sentence in (53b) is no longer problematic. To see why, let

us consider the structure of (53a) first, which is augmented by ARG-S.

(74) a. * Nay₁-ka caki₁-hanthey [s motun salam₂-i   Mary₁-lul
      I-top   self-to   all people-Nom M-Acc
      salanghantako]   malhay-cwuessta.
      love   tell-did-as-a-favor-for
      Lit.'I told herself₁ that all people loved Mary₁.'

```
     b.                              S
[7]NP::[1] [8]NP::[i]          S                    [4]V
     |        |        +-  +-    -+-+                  |
   nay-ka  caki-hanthey |CAT|VAL|SUBJ< >  |          malhay-cwuessta
                        |   |   |COMPS< >|
                        |   +-      -+
                        |ARG-S [3]
                        |CONTENT [4]
                        +-            -+
           [9]NP::[2]      [10]NP::[i]        [5]V
            /\                |         +-  +-            -+ -+
       motun salam-i       Mary-lul    |CAT|VAL|SUBJ<[9]NP::[2]>  |
                                       |   |   |COMPS<[10]NP::[i]>|
                                       |   +-                -+
                                       |ARG-S[3]|PRED love
                                       |        |SUBJ<NP::[2]>
                                       |        |COMPS<NP::[i]>
                                       |        +-            -+
                                       |CONTENT[4]|RELN love|
                                       |          |LOVER [2]|
                                       |          |LOVED [i]|
                                       +-         +-     -+   -+
                                                |
                                          salanghantako
```
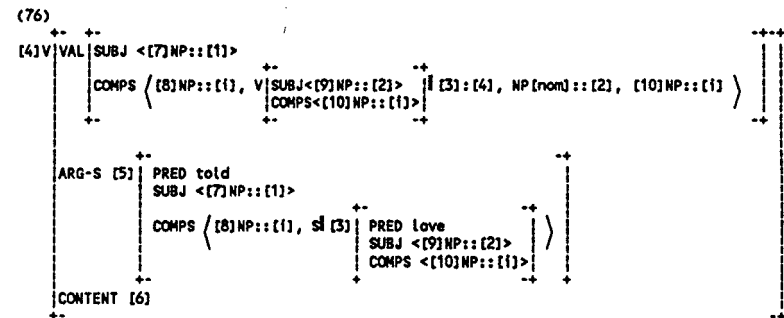
The structure for the matrix verb, [4]V, is as in (75). Here the tags after a double line ‖ and a colon : represent values of ARG-S and CONTENT of the constituent, respectively. E.g., in S‖[3]:[4] in the VAL|COMPS in (75), [3] and [4] represent S's ARG-S and CONTENT values, respectively.

(75)
```
          +-  +-                       -+              -+
     [4]V | VAL | SUBJ <[7]NP::[1]>       |              |
          |     | COMPS <[8]NP::[i], s‖[3]:[4]>|
          |     +-                        -+
          |  +-                                     -+
    ARG-S [5]| PRED told
          |  | SUBJ <[7]NP::[1]>
          |  |                        +-         -+
          |  | COMPS /[8]NP::[i], s‖[3]| PRED love      |
          |  |        \              | SUBJ <[9]NP::[2]> |
          |  |                       | COMPS <[10]NP::[i]>|
          |  |                       +-               -+
          |  +-                             -+
    CONTENT [6]| RELN told
          |    | TELLER [1]
          |    | TELLEE [i]
          |    |              +-          -+
          |    | SOA-ARG [4]| RELN love |
          |    |            | LOVER [2] |
          |    |            | LOVED [i] |
          +-   +-           +-        -+   -+
```

Note that in (75), the ARG-S of the complement clause, represented by [3], is inherited to the COMPS list of the ARG-S of the matrix verb.

If we apply to (75) the S-complement scrambling lexical rule ((116) in section 4.4.3.2 in chapter 4), then the output entry will be (76):

(76)
```
     +-  +-                                                        -+-+
  [4]V|VAL|SUBJ <[7]NP::[1]>                                         |
     |   |                        +-                    -+           |
     |   |COMPS /[8]NP::[i], V|SUBJ<[9]NP::[2]> |‖[3]:[4], NP[nom]::[2], [10]NP::[i] \ |
     |   |       \            |COMPS<[10]NP::[i]>|                  /  |
     |   +-                   +-               -+
     |ARG-S [5]| PRED told
     |         | SUBJ <[7]NP::[1]>
     |         |                   +-          -+
     |         | COMPS /[8]NP::[i], s‖[3]| PRED love       |
     |         |        \              | SUBJ <[9]NP::[2]> |
     |         |                       | COMPS <[10]NP::[i]>|
     |         +-                      +-               -+
     |CONTENT [6]|
     +-
```

Note that in (76), the values of ARG-S and CONTENT are not altered at all. Only the VALENCE value is changed through valence attraction to license a flat structure as in

(55). The CONTENT value is abbreviated by [6] since it has nothing to do with the current discussion. On this approach, the sentence in (53b) is not a problem any longer because it is an instance of a violation of principle C in (73). In the ARG-S of (76), the anaphor [8]NP::[i] is less oblique than the S-complement. Thus [8]NP::[1] locally a-p-commands the S-complement and thus a-p-commands the [10]NP *Mary-lul* which is contained in the S.

We also need to revise the variable binding condition for x-pronoun in (43) into (77):[11] [12]

(77)   Variable binding condition of *x-pronoun*:

An x-pronoun X may be bound by an operator O only if

either (i) O properly v-o-commands X

or   (ii) O-complex properly precedes X.

Here v-o-command is o-command at VALENCE, which is defined as in (78):

(78)   V-O-Command: X *v-o-commands* Y iff

X locally v-o-commands Z dominating (not necessarily properly) Y.

---

[11]The variable binding condition for y-pronoun (*ku*) does not need to be revised since it has nothing to do with o-command or p-command.

[12]In (77i), the notion of v-o-command can be substituted by v-p-command without any effect.

In (77i), we use the notion of v-o-command rather than a-o-command because we need to prevent (77) from applying to ARG-S. Otherwise, (77) incorrectly predicts the scrambled sentence in (48) to be acceptable. As already mentioned in the previous section, in (48), the complement anaphor [1]NP linearly precedes its complement binder [3]NP, and thus [1]NP is not locally v-p-commanded by [3]NP. In this case, the [1]NP is an exempt anaphor (x-pronoun). In this interpretation of [1]NP, (48) cannot be an acceptable structure since it does not satisfy the variable binding condition in (77), i.e., the binder [3]NP and the exempt [1]NP are in the same COMPS list and [1]NP linearly precedes [3]NP. And thus [3]NP neither properly v-o-commands nor properly precedes [1]NP.

However, if we allow (77) to apply at ARG-S, (48) will be incorrectly predicted to be acceptable as a sentence with an exempt anaphor. I.e., in the ARG-S, *nwukwu-hanthey* locally a-o-commands an ARG-S representing the S-complement and thus properly a-o-commands *caki-lul* contained within the S.

5.5. Summary and Conclusion

In this chapter, we discussed what theoretical predictions are made by our theory of long-distance scrambling. The phenomena discussed above suggest that in Korean, clause-internal scrambling and long-distance scrambling are syntactically indistinguishable. Our theory of long-distance scrambling can naturally account for this fact because both types of scrambling are licensed through flat structures. This unified account is possible due to

valence attraction.

The examples of long-distance passivization in section 5.1 and long-distance anaphor binding in section 5.4 suggest not only that both types of scrambling have the same properties, but also that the arguments of the embedded verb are attracted (or raised) to the COMPS list of the matrix verb.

We also revised the binding theory proposed in chapter 2. By means of valence attraction, we were able to consistently account for scrambling effects on binding of a clause-internally bound anaphor and a clause-externally bound anaphor. However, this also allowed an NP within an embedded clause to be a possible binder of a matrix anaphor, and thus principle C violation was not correctly predicted. To avoid this kind of problem, we assume that principles B and C, which are not affected by extraction or scrambling, apply at ARG-S, whose representation level is "deeper" than the level of VALENCE. However, detailed investigation of the nature of ARG-S and its relationship with other levels are left for further study.

CHAPTER VI

CONCLUSION

Main proposals of this thesis are summarized as follows: clause-internal scrambling and long-distance scrambling are syntactically indistinguishable, and thus they must be licensed in a uniform way. In our theory, both types of scrambling result from the relative freedom of linear precedence constraints among the non-head constituents at flat clausal structures. A crucial mechanism involved here is argument attraction, i.e., dependents (arguments and adjuncts) of a governed verb (the head of the complement VP or S) are attracted (or raised) to the COMPS list of the matrix verb. The supporting arguments for our claims are summarized as follows chapter by chapter.

In chapter 2, we have reviewed eight phenomena that have been claimed to provide crucial evidence for a hierarchical clause structure in Korean and Japanese. None of them turn out to be problematic for a flat analysis. Rather, the flat analysis seems to be preferable to the hierarchical analysis in accounts of some constructions such as word order variation in the emotion verb construction (section 2.1.1.3); anaphor binding (section 2.1.1.6); and weak crossover effects and bound variable binding (section 2.1.1.7). In section 2.2, we also argued for the flat structure analysis based on the more

general applicability of the mechanisms used in the flat analysis, compared with the mechanisms used in the hierarchical analysis. Canonical word order and discourse restrictions on scrambling were briefly sketched in section 2.3, based on the Principle of Information Flow.

Even though we propose that Korean does not have a VP node that makes the clausal structure hierarchical, it does not necessarily follow that Korean does not have a VP constituent at all. Rather, we simply suggest that Korean does not have a schema which says that an S consists of a subject and a predicate VP. Actually, we showed that verbs such as control or raising verbs subcategorize for a VP. In this case, we need to assume a VP constituent which is one of the complements of a particular lexical head and thus is a sister to the head.

In chapter 3, we discussed the auxiliary verb (AUX) construction in Korean. We proposed that an AUX and its selected verb form a verbal complex. The crucial mechanism that drives the analysis is argument attraction, which allows the VALENCE value of a selected verb to be attracted to the VALENCE value of the selecting AUX. By virtue of this mechanism, passivization and case alternation problems involved in the AUX construction are accounted for without any violation of the general assumption on passivization (an object can be passivized only when it is an argument of verb on which a passive morpheme is realized) and standard locality assumptions. On this approach, the arguments of a verbal complex (initially the arguments of the main verb) are all sisters. Thus scrambling in this construction results from the lack of LP constraints among the arguments, as does scrambling in a simplex sentence.

In chapter 4, we showed how the account of scrambling in a simplex sentence via the flat structure analysis can be extended to the account of so-called long-distance scrambling. This approach to long-distance scrambling entails that clause-internal scrambling is a special case of the same syntactic phenomenon as long-distance scrambling. The crucial mechanisms in our analysis of long-distance scrambling are valence attraction and lexical rules. More concretely, the following are proposed: (i) a matrix verb, its complement verb, and arguments or adjuncts of the complement verb which are attracted (raised) to the matrix verb are all sisters; (ii) different scrambling possibilities among different VP-complement constructions are accounted for by the applicability of a lexical rule, i.e., whether the matrix verb has only the input entry of the lexical rule, or only the output entry, or both of them; and (iii) scrambling out of an complement clause is also accounted for through the argument attraction mechanism. We also discuss how our theory can account for the afterthought construction and adjunct scrambling.

In chapter 5, we discussed four issues such as long-distance passivization, amelioration of WCO effects, licensing of NPIs, and long-distance *caki*-binding, and conclude that clause-internal scrambling and long-distance scrambling are syntactically indistinguishable. Our theory of long-distance scrambling can naturally account for this fact because we account for both types of scrambling through flat structures. This unified account is possible due to valence attraction. The examples of long-distance passivization in section 5.1 and long-distance anaphor binding in section 5.4 suggest not only that both types of scrambling have the same properties, but also that the arguments of the

embedded verb are attracted (or raised) to the COMPS list of the matrix verb.

We might think that we can provide similar accounts to the scrambling facts in Korean through the notion of "domain union" (Reape (1990, 1994) and Pollard, Kasper and Levine (1994)).[1] Reape's main idea is roughly as follows. Each combination of a head daughter and non-head daughter(s) which have their own word order domain yields a bigger word order domain which includes the word order domains of the head and non-head daughter(s). That is, the element(s) in the word order domains of a head and non-head daughters become the elements in the mother's order domain. The mechanism of domain union differs from that of argument attraction in that the former simply extends a word order domain of a smaller constituent into that of a bigger constituent without rearranging the argument structure. Therefore, it seems to be hard to think of natural ways to explain through the notion of domain union the facts about long-distance passivization (section 5.1) and long-distance anaphor binding (section 5.4).

Our analysis may be compatible with the A-movement approach in GB (Yoshimura (1989)), since argument attraction is similar to raising in some sense. However, the A-movement approach seems to be problematic under the current GB framework. Under the standard assumptions, A-movement (e.g., raising and passivization in English) is triggered by certain syntactic factors such as Case theory and Theta theory (Bayer and Kornfilt (199?)). The problem is that it is hard to find any syntactic factors triggering scrambling in Korean. Based on facts about the verbal noun construction, however, Lee (1992) proposes that case alternation and word order variation are derived

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[1] Dowty (1990) independently proposes a similar theory in Categorial Grammar.

from the interaction between (i) the scope of an aspect morpheme, and (ii) different licensing conditions for nominative, accusative, and genitive case. (See Miyagawa (1991) for similar claims in Japanese.) This study suggests that scrambling is allowed as long as a constituent is within a scope of an appropriate Case assignor, and thus that scrambling is a Case-driven phenomenon. If this proposal is valid, our theory may be convertible to the theory of A-movement, even though presently we are not sure how long-distance scrambling and its effects on the binding theory can be handled in the Case-driven theory.

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