

# A semantic restriction on scrambling in Korean

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## 1 Introduction

Scrambling is used in the literature as a cover term for a process that derives non-canonical word order patterns in so-called free word order languages such as German, Hindi, Japanese, Korean, and Turkish. In such languages, constituents can appear in a wide variety of surface orders, without changing the core meaning of the sentence.

Korean, one of these free word order languages, is typologically a Subject-Object-Verb (SOV) language, characterized by a predicate that comes at the end of the sentence as in (1).

- (1)   Minho-ka       chyak-ul       ilknunta  
      Minho-NOM    book-ACC       reads  
      ‘Minho reads a book.’

However, Korean sentences routinely diverge from the basic SOV order in (1), and the scrambled sentences like (2) are fully grammatical.

- (2)   chyak-ul       Minho-ka       ilknunta  
      book-ACC     Minho-NOM     reads  
      ‘Minho reads a book.’

Traditionally the flexibility of syntactic constituents in Korean is attributed to its rich system of overt Case-markers. Since the grammatical function of a noun phrase is marked by the Case-markers, the linear ordering of the subject and the direct object can change, leaving the underlying interpretation and grammaticality of the sentence unaffected.

Scrambling has often been described as a process that applies without constraint. This is implicit in the very notion of a free word order language. However, this traditional view is oversimplified. According to traditional grammars of Korean such as Nam (2001) and Martin (1992), there are several restrictions on Korean scrambling.

Section 2 investigates the generality of scrambling in Korean, focusing on three important restrictions on scrambling: no rightward scrambling over the verb, no leftward scrambling over the same Case-marker, and no scrambling within small clauses.

Section 3, section 4, and section 5 search for a unified approach to these restrictions. In section 3, I form a hypothesis based on thematic roles. It uses the existence of theta-roles to conjecture that only theta-role-assigned constituents can scramble. In section 4, I form a competing hypothesis. This hypothesis uses the distinction between semantic completeness and semantic incompleteness to argue that only semantically complete constituents can scramble. In section 5, after I compare the two hypotheses empirically, I conclude that the three restrictions on Korean scrambling are explained by the single generalization that predicates (semantically incomplete constituents) do not scramble.

Section 6 summarizes the main results of this paper and briefly addresses its broader significance.

## 2 Restrictions on scrambling in Korean

### 2.1 No rightward scrambling over the verb

In Korean, scrambling of the constituents in a sentence is permissible as long as the verb occurs sentence-finally. That is to say, there is no rightward scrambling over the verb in Korean, nor can the verb be scrambled to the left of its arguments. Consider (3-5).

- (3)   Minho-ka   Yongho-ka   pap-ul   mekessta-ko   malhyassta  
 Minho-NOM   Yongho-NOM   meal-ACC   ate-COMP   said  
 ‘Minho said that Yongho ate a meal.’
- (4)   \*Minho-ka   Yongho-ka   mekessta-ko   pap-ul   malhyassta  
 Minho-NOM   Yongho-NOM   ate-COMP   meal-ACC   said  
 ‘Minho said that Yongho ate a meal.’
- (5)   \*Minho-ka   mekessta-ko   Yongho-ka   pap-ul   malhyassta  
 Minho-NOM   ate-COMP   Yongho-NOM   meal-ACC   said  
 ‘Minho said that Yongho ate a meal.’

Each of the examples (3-5) has two clauses: a matrix clause and an embedded clause. As is well-known, scrambling in (4) and (5) is not permissible where *Yongho-ka* ‘Yongho-NOM’ and *pap-ul* ‘meal-ACC’ have scrambled over their predicate, the verb *mekessta* ‘ate’. Scrambling is not permissible when any argument of (3) is positioned to the right of its predicate.

Kayne (1994) is able to correlate linear order with hierarchical order. Abandoning standard X-bar assumptions (Chomsky 1986), Kayne argues that there is a universal Specifier-Head-Complement (Subject-Verb-Object) ordering, and that specifiers are the only instances of adjuncts. Kayne’s claim (combined with the standard ban on lowering operations) leads us to conclude that there can be no rightward movement operations in any language (Kayne 2005).<sup>1</sup> Following Kayne (1994, 2005), we conclude that the moved constituent in (4) and (5) must be the verb *mekessta* ‘ate’, as illustrated in (6) and (7).

- (6) \*Minho-ka Yongho-ka mekessta-ko<sub>k</sub> pap-ul t<sub>k</sub> malhyassta  
 Minho-NOM Yongho-NOM ate-COMP meal-ACC said  
 ‘Minho said that Yongho ate a meal.’
- (7) \*Minho-ka mekessta-ko<sub>k</sub> Yongho-ka pap-ul t<sub>k</sub> malhyassta  
 Minho-NOM ate-COMP Yongho-NOM meal-ACC said  
 ‘Minho said that Yongho ate a meal.’

(6) and (7) illustrate the ban on leftward scrambling of the verb over arguments.

## 2.2 No leftward scrambling over the same Case-marker

Korean prohibits scrambling of a noun phrase over another noun phrase when they are assigned the same morphological Case (Kim 1989, 1990). That is, there is no leftward scrambling over the same Case-marker.

- (8) kwulum-i pi-ka toynta  
 cloud-NOM rain-NOM becomes  
 ‘The cloud becomes the rain.’
- (9) \*pi-ka kwulum-i toynta  
 rain-NOM cloud-NOM becomes  
 ‘The cloud becomes the rain.’

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<sup>1</sup> Although I assume Kayne’s antisymmetry syntax, the structure of the examples in this paper is represented in the framework of standard X-bar theory for expository convenience.

In (8), the sentence has two instances of nominative Case marking (realized by *-i* and *-ka*).<sup>2</sup> However, when scrambling is applied to produce the sentence (9), the result is ungrammatical.

Kim's (1989, 1990) descriptive constraint mentioned above also covers the Korean double accusative construction. This construction admits a second accusative Case-marked noun if it represents the part, kind, or number of the first accusative Case-marked noun. The example in (10) illustrates the double accusative construction. Examples (11-13) demonstrate that in a double accusative construction sentence, scrambling is not permitted.

- (10) etten salam-i ku eyca-lul<sub>i</sub> pal-ul<sub>j</sub> capakkulessta  
 certain person-NOM the woman-ACC arm-ACC pulled  
 'A certain person pulled the woman's arm.'
- (11) \*etten salam-i pal-ul<sub>j</sub> ku eyca-lul t<sub>j</sub> capakkulessta  
 certain person-NOM arm-ACC the woman-ACC pulled  
 'A certain person pulled the woman's arm.'
- (12) \*pal-ul<sub>j</sub> etten salam-i ku eyca-lul t<sub>j</sub> capakkulessta  
 arm-ACC certain person-NOM the woman-ACC pulled  
 'A certain person pulled the woman's arm.'
- (13) \*pal-ul<sub>j</sub> ku eyca-lul<sub>i</sub> t<sub>j</sub>' etten salam-i t<sub>i</sub> t<sub>j</sub> capakkulessta  
 arm-ACC the woman-ACC certain person-NOM pulled  
 'A certain person pulled the woman's arm.'

In (10-13), the sentence has two accusative Cases realized by the Case-markers *-ul* and *-lul*.<sup>3</sup> In (10-12), when leftward scrambling over the same Case-marker occurs, the sentence becomes ungrammatical.

However, even in the double accusative construction, scrambling may occur as long as the second accusative noun is preceded by the first accusative noun, as in (14-16).

<sup>2</sup> In Korean, the nominative Case-markers are *-i* and *-ka*. The choice between *-i* and *-ka* is determined phonologically: the former is chosen when the preceding syllable ends in a consonant, and the latter, when it ends in a vowel (Lee and Ramsey 2000).

<sup>3</sup> In Korean, the accusative Case-markers are *-ul* and *-lul*. The choice between *-ul* and *-lul* is determined phonologically: the former is chosen when the preceding syllable ends in a consonant, and the latter, when it ends in a vowel (Lee and Ramsey 2000).

- (14) etten salam-i ku eyca-lul<sub>i</sub> pal-ul<sub>j</sub> capakkulessta  
 certain person-NOM the woman-ACC arm-ACC pulled  
 ‘A certain person pulled the woman’s arm.’
- (15) ku eyca-lul<sub>i</sub> pal-ul<sub>j</sub> etten salam-i t<sub>i</sub> t<sub>j</sub> capakkulessta  
 the woman-ACC arm-ACC certain person-NOM pulled  
 ‘A certain person pulled the woman’s arm.’
- (16) ku eyca-lul<sub>i</sub> etten salam-i t<sub>i</sub> pal-ul<sub>j</sub> capakkulessta  
 the woman-ACC certain person-NOM arm-ACC pulled  
 ‘A certain person pulled the woman’s arm.’

In (15), both the first accusative noun *ku eyca-lul* ‘the woman-ACC’ and the second accusative noun *pal-ul* ‘arm-ACC’ are scrambled over the nominative noun *etten salam-i* ‘certain person-NOM’. In (16), the first accusative noun *ku eyca-lul* ‘the woman-ACC’ is scrambled over the nominative noun *etten salam-i* ‘certain person-NOM’. In both sentences, the second accusative noun is preceded by the first accusative noun.

### 2.3 Scrambling and small clauses

In Korean, scrambling within a small clause is not permissible. That is to say, in the small clause, scrambling between the subject and its predicate is not acceptable. Consider (17-20).

- (17) salamtul-i ku-lul<sub>i</sub> pwuca-lo<sub>j</sub> syangkakhyassta  
 people-NOM he-ACC rich.man-as thought  
 ‘People thought of him as a rich man.’
- (18) \*salamtul-i pwuca-lo<sub>j</sub> ku-lul<sub>i</sub> t<sub>j</sub> syangkakhyassta  
 people-NOM rich.man-as he-ACC thought  
 ‘People thought of him as a rich man.’
- (19) \*pwuca-lo<sub>j</sub> salam-tul-i ku-lul<sub>i</sub> t<sub>j</sub> syangkakhyassta  
 rich.man-as people-NOM he-ACC thought  
 ‘People thought of him as a rich man.’
- (20) \*pwuca-lo<sub>j</sub> ku-lul<sub>i</sub> t<sub>j</sub>’ salamtul-i t<sub>i</sub> t<sub>j</sub> syangkakhyassta  
 rich.man-as he-ACC people-NOM thought  
 ‘People thought of him as a rich man.’

In (18-20), when a constituent of a small clause is scrambled, the sentence becomes ungrammatical. However, in (21) and (22), the sentence is acceptable as long as these two constituents preserve their original sequence.

(21) ku-lul<sub>i</sub> pwuca-lo<sub>j</sub> salamtul-i t<sub>i</sub> t<sub>j</sub> syangkakhyassta  
 he-ACC rich.man-as people-NOM thought  
 ‘People thought of him as a rich man.’

(22) ku-lul<sub>i</sub> salamtul-i t<sub>i</sub> pwuca-lo<sub>j</sub> syangkakhyassta  
 he-ACC people-NOM rich.man-as thought  
 ‘People thought of him as a rich man.’

### 3 A hypothesis based on thematic roles

#### 3.1 Thematic roles

Thematic roles (henceforth  $\theta$ -roles) have played an important role in linguistic theory since the ground breaking work in Gruber (1965), Fillmore (1965, 1968), and Jackendoff (1972, 1976). While  $\theta$ -roles were identified intuitively in this early work, subsequent work in formal semantics, particularly Montague Grammar, stressed the importance of entailment relations between sentences.

Since Jackendoff (1976) it has been common to use entailment relations to characterize  $\theta$ -roles. On this view  $\theta$ -roles serve to define classes of predicates that license similar entailments (Parsons 1990, Dowty 1991). For instance, consider the following two-place predicates: *murder*, *nominate*, and *interrogate*. These predicates have similar entailments: 1) the subject argument of each predicate performs a volitional act, 2) it intends to be the sort of act identified by the verb, and 3) in each case the subject causes an event to take place involving the object argument. The subject of these predicates has the same  $\theta$ -role, which we can identify as Agent for expository convenience. Not all subjects of all predicates are Agents in this sense. The first entailment is not shared by *kill*, since non-volitional things such as traffic accidents can also kill. The second entailment is not shared by *convince* or *kill*, since we can convince or kill unintentionally, but cannot murder or nominate unintentionally. The last entailment is not shared by *look at*, since it does not cause the event to take place involving the object argument. The subjects of these predicates have distinct  $\theta$ -roles although there is considerable variation among researchers on how to identify them. Some authors identify the subject of psychological predicates such as *convince* as a source, others take it to be a theme, and still others suggest a distinct role stimulus. More recently there has been a debate about whether  $\theta$ -roles can be partitioned into strict classes with necessary and sufficient criteria. While there has been a lack of consensus of the

inventory of  $\theta$ -roles, the general notion of  $\theta$ -roles has played an important role in syntactic theorizing.

### 3.2 An explanation with $\theta$ -roles

The  $\theta$ -roles given in the above characterization can be used to frame a hypothesis to explain the numerous restrictions on scrambling in Korean in section 3.2. Let us entertain the hypothesis in (23).

- (23) X may scramble if and only if X heads a chain containing a unique visible  $\theta$ -position P.

The principle in (23) only allows X to scramble if it has been assigned a  $\theta$ -role. In (15-16), we see an acceptable case of scrambling in the double accusative construction. In (15), the scrambled constituent *ku eyca-lul<sub>i</sub> pal-ul<sub>j</sub>* ‘the woman-ACC arm-ACC’ has been assigned a  $\theta$ -role by the verb *capakkulessta* ‘pulled’, making it available for scrambling.<sup>4</sup>

However, in (10-13), scrambling causes grammaticality judgments to degrade. The hypothesis in (23) will attribute this degradation to the fact that the scrambled constituent has not been given a  $\theta$ -role. In (11) and (12), the scrambled constituent *pal-ul<sub>j</sub>* ‘arm-ACC’ is not given a  $\theta$ -role. One might think that it is provided a  $\theta$ -role from the verb *capakkulessta* ‘pulled’, but the verbal predicate gives a  $\theta$ -role to the whole NP *ku eyca-lul<sub>i</sub> pal-ul<sub>j</sub>* ‘the woman-ACC arm-ACC’, not just the second NP *pal-ul<sub>j</sub>* ‘arm-ACC’. The reason why the verb assigns the  $\theta$ -role to the whole NP in (11) and (12) is that the theme of the predicate pull is *ku eyca-lul<sub>i</sub> pal-ul<sub>j</sub>* ‘the woman-ACC arm-ACC’ as a whole, not just *pal-ul<sub>j</sub>* ‘arm-ACC’.

In (13), two constituents have scrambled. First the whole NP *ku eyca-lul<sub>i</sub> pal-ul<sub>j</sub>* ‘the woman-ACC arm-ACC’ has scrambled from its underlying position, and then the second NP *pal-ul<sub>j</sub>* ‘arm-ACC’ scrambles from the intermediate position *t<sub>j</sub>*. The first scrambled constituent has been given a  $\theta$ -role, but the second scrambled constituent is not given a  $\theta$ -role. The fact that the second scrambled constituent has not been given a  $\theta$ -role gives us the degradation of acceptability in (13).

In (16), we can see another possible case of scrambling in the double accusative construction. By the hypothesis in (23), the scrambled constituent *ku eyca-lul<sub>i</sub>* ‘the woman-ACC’ must have been given a  $\theta$ -role by the predicate (here the second accusative NP *pal-ul<sub>j</sub>* ‘arm-ACC’). The claim that the second accusative NP *pal-ul<sub>j</sub>* ‘arm-ACC’ gives the first accusative NP *ku eyca-lul<sub>i</sub>* ‘the

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<sup>4</sup> Scrambling of ku eyca-lul ‘the woman-ACC’ in (16) will be explained after the discussion of (13) below.

woman-ACC' a  $\theta$ -role in the double accusative construction is made plausible by the fact that the first accusative NP always expresses an argument of a relation. In the Korean double accusative construction, the second accusative Case-marked NP represents the part, kind, or number of the first one. That is, the first accusative Case-marked NP is an argument of that relation and receives a  $\theta$ -role from that relation.<sup>5</sup>

The same account can be provided for small clause examples in (17-22). In (21), which is a possible case of scrambling in the small clause, the scrambled constituent *ku-lul<sub>i</sub> pwuca-lo<sub>j</sub>* 'he-ACC rich man-as' is given a  $\theta$ -role by the verb *syangkakhyassta* 'thought'. In (22), which is another possible case of scrambling in the small clause, the scrambled constituent *ku-lul<sub>i</sub>* 'he-ACC' is given a  $\theta$ -role by the NP predicate *pwuca-lo<sub>j</sub>* 'rich man-as'.

However, in the ungrammatical (18-20), the scrambled constituent is not given a  $\theta$ -role. In (18) and (19), the scrambled constituent *pwuca-lo<sub>j</sub>* 'rich man-as' has not been given a  $\theta$ -role. Like the case of (11) and (12), one might think that it is provided a  $\theta$ -role from the verb *syangkakhyassta* 'thought', but the verb predicate gives a  $\theta$ -role to the small clause *ku-lul<sub>i</sub> pwuca-lo<sub>j</sub>* 'he-ACC rich man-as' as a whole, not just the NP predicate *pwuca-lo<sub>j</sub>* 'rich man-as'.

In (20), as in (13), there are two instances of scrambling. The first one is the scrambling of the entire small clause *ku-lul<sub>i</sub> pwuca-lo<sub>j</sub>* 'he-ACC rich man-as' from its underlying position, and the second one is the scrambling of the NP predicate *pwuca-lo<sub>j</sub>* 'rich man-as' from the intermediate position *t<sub>j</sub>'*. The first scrambled constituent is given a  $\theta$ -role, but the second scrambled one is not given a  $\theta$ -role. This is because the NP predicate of small clauses is not in A-position.  $\theta$ -roles can be assigned only to A-positions, and the NP predicate *pwuca-lo<sub>j</sub>* 'rich man-as' is not in A-position. In addition, consider (24-26).

(24) *salamtul-i* *Minho-lul<sub>i</sub>* *pwuca-lo<sub>j</sub>* *syangkakhyassta*  
 people-NOM Minho-ACC rich.man-as thought  
 'People thought of Minho as a rich man.'

(25) *salamtul-i* *motun* *Minho-lul<sub>i</sub>* *pwuca-lo<sub>j</sub>* *syangkakhyassta*  
 people-NOM every Minho-ACC rich.man-as thought  
 'People thought of every Minho as a rich man.'

(26) \**salamtul-i* *Minho-lul<sub>i</sub>* *motun* *pwuca-lo<sub>j</sub>* *syangkakhyassta*  
 people-NOM Minho-ACC every rich.man-as thought  
 'People thought of Minho as every rich man.'

<sup>5</sup> The two accusative NPs are in a part/whole relation. In the terms of Jackendoff (1976), this relation can be stated as the function BE<sub>POSS</sub> (2<sup>nd</sup> NP, 1<sup>st</sup> NP).

In (25), *Minho-lul<sub>i</sub>* ‘Minho-ACC’ is easily quantified, but *pwuca-lo<sub>j</sub>* ‘rich man-as’ in (26) resists being quantified. This shows that *pwuca-lo<sub>j</sub>* ‘rich man-as’ is a predicate. In (17-22), *pwuca-lo<sub>j</sub>* ‘rich man-as’ is not assigned a  $\theta$ -role and thus is not allowed to be scrambled.

The hypothesis in (23) unifies the numerous restrictions on scrambling by preventing scrambling of the phrases without  $\theta$ -roles. We have seen that the prohibition on scrambling phrases that lack  $\theta$ -roles can explain the pattern of scrambling in both the double accusative construction and the small clause construction.

This explanation may also explain the restriction on the leftward scrambling of the verb over the arguments. In (6) and (7), the scrambled constituent is the verb *mekessta* ‘ate’, and it lacks a  $\theta$ -role. Scrambling in (6) and (7) is not acceptable in light of (27).

However, the extension of this explanation to the restriction on the leftward scrambling over the same Case-marker in (8) and (9) is problematic. In (8) and (9), both *kwulum-i* ‘cloud-NOM’ and *pi-ka* ‘rain-NOM’ are assigned a  $\theta$ -role, but the scrambling of *pi-ka* ‘rain-NOM’ is not allowed.<sup>6</sup> To explain this problem, we need to assimilate it to superiority phenomena. Between *kwulum-i* ‘cloud-NOM’ and *pi-ka* ‘rain-NOM’, the former is superior in the hierarchical structure. When scrambling is applied to them, it has to be applied to *kwulum-i* ‘cloud-NOM’. If the structurally inferior *pi-ka* ‘rain-NOM’ is scrambled, then it violates the Minimal Link Condition of Chomsky (1995), which is designed to capture superiority phenomena.

## **4 A hypothesis based on semantic completeness**

### **4.1 Semantic completeness vs. semantic incompleteness**

In the tradition of formal semantics, expressions are partitioned into two classes. One class is semantically complete, or saturated. The second class is semantically incomplete, or unsaturated. Predicates are regarded as incomplete, and they are made complete by composing (via functional application) with semantically complete terms. There are two types of saturated meanings which represent semantic completeness: entities (or individuals) and truth-values. In this analysis, the unsaturated meanings are construed as functions. The unsaturated meanings take arguments, and saturation consists in the application of a function to its arguments.

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<sup>6</sup> In terms of Jackendoff (1976), *pi-ka* ‘rain-NOM’ has a  $\theta$ -role, as shown in  $GO_{IDENT}$  (CLOUD,  $y$ , RAIN).

## 4.2 An explanation with semantic completeness

The concept of a function as it is used in formal semantics allows us to frame an alternative hypothesis to explain the limitations on scrambling in Korean. Specifically, let us entertain the hypothesis in (27):

(27) X may scramble if and only if X is semantically complete.

(11-13) are judged unacceptable because of the application of scrambling. The scrambled constituents in (11-13) are semantic functions which are incomplete, and by (27) they are not permissible candidates for scrambling. In (11) and (12), the scrambled constituent *pal-ul<sub>j</sub>* ‘arm-ACC’ is semantically incomplete, as *pal-ul<sub>j</sub>* ‘arm-ACC’ needs to be composed with *ku eyca-lul<sub>i</sub>* ‘the woman-ACC’ to convey the complete meaning of the object in the double accusative construction (10-13). The unsaturated meaning of the second NP *pal-ul<sub>j</sub>* ‘arm-ACC’ is saturated by taking an argument, the first NP *ku eyca-lul<sub>i</sub>* ‘the woman-ACC’. In (13), there are two instances of scrambling. The first one is the scrambling of the whole NP *ku eyca-lul<sub>i</sub> pal-ul<sub>j</sub>* ‘the woman-ACC arm-ACC’ from its underlying position, and the second one is the scrambling of the second NP *pal-ul<sub>j</sub>* ‘arm-ACC’ from the intermediate position *t<sub>j</sub>*. The first scrambled constituent is not semantically incomplete, but the second scrambled constituent is semantically incomplete. In both (11-12) and (13), the scrambling of the phrases which are semantically incomplete makes each example ungrammatical. That is, as shown in (10-13), the phrases corresponding to functions cannot be scrambled.

Consider now (14-16). It is possible to produce (15) because the scrambled constituent *ku eyca-lul<sub>i</sub> pal-ul<sub>j</sub>* ‘the woman-ACC arm-ACC’ is semantically complete. In (16), which is another possible case of scrambling in the double accusative construction (14), the scrambled constituent *ku eyca-lul<sub>i</sub>* ‘the woman-ACC’ is also semantically complete.

In the case of the small clauses that are judged to be ungrammatical, the scrambled phrases are functions. Consider again (18-20). In (18-19), the scrambled phrase *pwuca-lo<sub>j</sub>* ‘rich man-as’ is semantically incomplete. Like the case of (11) and (12), one might think that in (18) and (19) the scrambled constituent is semantically complete. However, in fact, this is not the case since the unsaturated meaning of the NP predicate *pwuca-lo<sub>j</sub>* ‘rich man-as’ is supplemented by taking an argument: *ku-lul<sub>i</sub>* ‘he-ACC’. The NP predicate *pwuca-lo<sub>j</sub>* ‘rich man-as’ functions as a semantic predicate. The validity of this assertion is supported by the distribution of the quantifiers in (28) and (29). The resistance of an NP predicate *pwuca-lo* ‘rich man-as’ to quantification in small clauses suggests that it is a function (of type  $\langle e, t \rangle$ ).

- (28) *salamtul-i motun uysa-lul pwuca-lo syangkakhyassta*  
 people-NOM every doctor-ACC rich.man-as thought  
 ‘People thought of every doctor as a rich man.’
- (29) \**salamtul-i uysa-lul motun pwuca-lo syangkakhyassta*  
 people-NOM doctor-ACC every rich.man-as thought  
 ‘\*People thought of a doctor as every rich man.’

In (20), again like the case of (13), there are two instances of scrambling. The first one is the scrambling of the entire small clause *ku-lul<sub>i</sub> pwuca-lo<sub>j</sub>* ‘he-ACC rich man-as’ from its underlying position, and the second one is the scrambling of the NP predicate *pwuca-lo<sub>j</sub>* ‘rich man-as’ from the intermediate position *t<sub>j</sub>*. The first scrambled constituent is semantically complete, but the second scrambled constituent is semantically incomplete. In all of (18-20), the scrambling of phrases corresponding to semantic functions is prevented.

On the other hand, in (21), which is a possible case of scrambling of the small clause, the scrambled constituent *ku-lul pwuca-lo* ‘he-ACC rich man-as’ is semantically complete (corresponding to type <t>). In (22), which is another possible case of scrambling from the small clause, the scrambled constituent *ku-lul<sub>i</sub>* ‘he-ACC’ is also complete (corresponding to type <e>). In neither (21) nor (22) are the scrambled phrases functions (of type <e, t> or higher).

The hypothesis (27) unifies the restrictions on scrambling by preventing the scrambling of the phrases corresponding to functions. Only the phrases which are semantically complete can be scrambled. That is, a phrase that is an unsaturated function cannot be scrambled. The ban on scrambling semantically incomplete phrases can explain the scrambling pattern found in the double accusative construction and small clauses.

This explanation may also extend to the restriction on the leftward scrambling of the verb over its arguments. In (6) and (7), the scrambled constituent is the verb *mekessta* ‘ate’. Of course, as a predicate function, it is semantically incomplete in the sense that it needs to take two arguments to form a sentence of semantic type <t>. The scrambling in (6) and (7) is not allowed by (27).

Finally, unlike the  $\theta$ -role explanation explored in the previous section, this explanation accounts for the restriction on leftward scrambling over the same Case-marker as in (8) and (9). In (8) and (9), unlike *kwulum-i* ‘cloud-NOM’, *pi-ka* ‘rain-NOM’ is a semantic predicate; it becomes saturated when it is applied to the argument *kwurum-i* ‘cloud-NOM’. The validity of this assertion is again supported by the distribution of quantifiers. The resistance of *pi-ka* ‘rain-NOM’ to quantification in (31) suggests that it is a function (of type <e, t>). The scrambling

of the semantically incomplete phrase *pi-ka* ‘rain-NOM’ is prevented. In this case, we don’t need to appeal to the additional explanatory device of the superiority condition.

(30) motun kwurum-i pi-ka toynta  
 every cloud-NOM rain-NOM becomes  
 ‘Every cloud becomes the rain.’

(31) \*kwulum-i motun pi-ka toynta  
 cloud-NOM every rain-NOM becomes  
 ‘\*The cloud becomes every rain.’

Therefore, the semantically incomplete *pi-ka* ‘rain-NOM’ in (8) cannot be scrambled to produce (9) by the hypothesis in (27).

## 5 The advantage of the hypothesis based on semantic completeness

In the previous sections, I have tried to explain the restrictions of Korean scrambling in two different ways. The first hypothesis appeals to the notion of  $\theta$ -roles. On this hypothesis, scrambling is permissible if and only if scrambled phrases are assigned a  $\theta$ -role. If a phrase lacks a  $\theta$ -role, it is unavailable for scrambling. The second hypothesis makes use of the distinction between semantic completeness and semantic incompleteness. We saw that a phrase is available for scrambling only if it is semantically complete. If a phrase is semantically incomplete, then it is unavailable for scrambling.

The two hypotheses diverge empirically with regard to phrases that are semantically complete but have no obvious  $\theta$ -role. If only  $\theta$ -marked phrases scramble, such a phrase should be frozen in place. If semantically complete expressions are available for scrambling, the constituent should be mobile.

The examples in (32-37) test these competing predictions. (32) contains the locative adjunct *hakkyo-yese* ‘school-LOC’ and the temporal adjunct *han si-ye* ‘one o’clock-at’. These expressions are adjuncts and not arguments of the verb *kitary-* ‘wait’: they are absent in (33), and long distance scrambling of them is not acceptable in (34-35).<sup>7</sup>

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<sup>7</sup> I assume that (32) is the underlying form of (36) and (37). Under the movement approach to scrambling, it is generally assumed that the direct object NP *ne-lul* ‘you-ACC’ is adjacent to the predicate *kitaryeyssta* ‘waited’ underlyingly, from which it receives a  $\theta$ -role under sisterhood.

- (32) nya-ka hakkyo-yese han si-ye ne-lul kitaryeyssta  
 I-NOM school-LOC one o'clock-at you-ACC waited  
 'I waited for you at the school at one o'clock.'
- (33) nya-ka ne-lul kitaryeyssta  
 I-NOM you-ACC waited  
 'I waited for you.'
- (34) Yongho-ka nya-ka hakkyo-yese<sub>i</sub> han si-ye<sub>j</sub>  
 Yongho-NOM I-NOM school-LOC one o'clock-at  
  
 ne-lul kitaryeyssta-ko syangkakhyassta  
 you-ACC waited-COMP thought  
 'Yongho thought that I waited for you at the school at one o'clock.'
- (35) \*hakkyo-yese<sub>i</sub> han si-ye<sub>j</sub> Yongho-ka nya-ka t<sub>i</sub> t<sub>j</sub>  
 school-LOC one o'clock-at Yongho-NOM I-NOM  
  
 ne-lul kitaryeyssta-ko syangkakhyassta  
 you-ACC waited-COMP thought  
 'Yongho thought that I waited for you at the school at one o'clock.'
- (36) hakkyo-yese<sub>i</sub> nya-ka t<sub>i</sub> han si-ye ne-lul kitaryeyssta  
 school-LOC I-NOM one o'clock-at you-ACC waited  
 'I waited for you at the school at one o'clock.'
- (37) hakkyo-yese<sub>i</sub> han si-ye<sub>j</sub> nya-ka t<sub>i</sub> t<sub>j</sub> ne-lul kitaryeyssta  
 school-LOC one o'clock-at I-NOM you-ACC waited  
 'I waited for you at the school at one o'clock.'

In (36), the locative adjunct *hakkyo-yese* 'school-LOC' does not have a  $\theta$ -role, but it has scrambled. In (37), neither the locative adjunct *hakkyo-yese* 'school-LOC' nor the temporal adjunct *han si-ye* 'one o'clock-at' have  $\theta$ -roles, but they have scrambled as well. Recall that this type of scrambling is predicted to be impossible on the  $\theta$ -role hypothesis. However, on the semantic completeness hypothesis, the grammaticality of (36) and (37) is predicted, since both the locative adjunct *hakkyo-yese* 'school-LOC' and the temporal adjunct *han si-ye* 'one o'clock-at' are semantically complete.

The empirical evidence in (32-37) illustrates that phrases with semantic completeness but without  $\theta$ -roles can scramble. This observation leads us to prefer the hypothesis that semantic completeness is a prerequisite to scrambling

and gives a unified account of the restrictions on scrambling in Korean. In Korean, only semantically complete phrases scramble. In other words, semantically incomplete phrases (i.e. predicates) do not scramble.

## 6 Conclusion

Korean has several restrictions on scrambling: scrambling of a constituent in a sentence is permissible as long as the verb occurs sentence-finally; scrambling of a noun phrase over another noun phrase is prohibited when they are assigned the same morphological Case; and scrambling within a small clause is not permissible. These restrictions have been previously noted in traditional grammars but they have remained as a heterogeneous disjunctive set.

In order to provide a unified approach to these properties of scrambling in Korean, I framed two competing hypotheses. One ties scrambling to  $\theta$ -role assignment. It contends that scrambling is permissible if and only if the scrambled phrase is assigned a  $\theta$ -role. If a scrambled phrase lacks a  $\theta$ -role, then scrambling is not acceptable. The other hypothesis is based on the distinction between semantic completeness and semantic incompleteness. On the second hypothesis, scrambling is permissible if and only if the scrambled phrase is semantically complete.

The two hypotheses diverge with regard to phrases that are semantically complete but have no  $\theta$ -role. If only  $\theta$ -marked phrases scramble, such phrases should be frozen in place. If, on the other hand, all semantically complete expressions are available for scrambling, the constituent should be mobile. Empirical evidence involving the scrambling of adjuncts leads us to choose the second hypothesis: only semantically complete constituents scramble.

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*A semantic restriction on scrambling in Korean*

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