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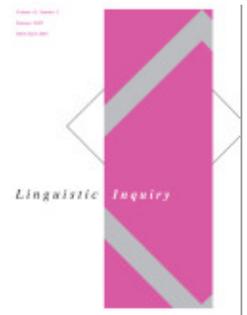
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## **Asymmetries in Scrambling and Cyclic Linearization**

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# Asymmetries in Scrambling and Cyclic Linearization

*Heejeong Ko*

I argue that linear order in constructions with scrambling is constrained by Cyclic Linearization of syntactic structure at the interface, and I show that this proposal provides a unified account for a variety of asymmetries in scrambling. Arguments in this article establish novel evidence for the thesis that the architecture of grammar requires linearization in phonology to be cyclically determined by the syntax. The article also sheds light on the distribution of floating quantifiers, possessor-raising constructions, and formal properties of scrambling.

*Keywords:* scrambling, Cyclic Linearization, Spell-Out, floating quantifiers, possessor raising, adverbs, Korean

How the units of a linguistic expression are linearly ordered is one of the central issues in syntax. In this article, I address this issue by investigating principles governing linearization in constructions with scrambling. In particular, I propose that scrambling is constrained by the Cyclic Linearization of syntactic structure at the phonology-syntax interface. Evidence for this proposal is drawn from a range of asymmetries in scrambling—in particular, a variety of otherwise puzzling restrictions on the distribution of floating numeral quantifiers and possessor-raising constructions are explained under this proposal. Among the consequences of this article for syntactic theory is a demonstration that linear ordering in scrambling is not flexible but rigid—to the extent that only a particular type of word order variation is allowed as a consequence of cyclic Spell-Out. In demonstrating this, the article contributes to the thesis that so-called free word order phenomena in scrambling and their exceptions are explained by a general theory of movement and linearization.

## 1 Proposal

In this section, I introduce the main proposal of the article concerning linearization in scrambling. I argue that constructions with scrambling are cyclically linearized at the PF-syntax interface via

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Spell-Out, as Fox and Pesetsky (2003, 2005a,b) have argued extensively on the basis of other types of movement such as object shift. The initial evidence for my proposal comes from a long-standing puzzle: a subject-object asymmetry in licensing floating numeral quantifiers in Korean. After establishing that previous accounts that rely on a “ban on subject scrambling” (Saito 1985) cannot handle the puzzle properly, I argue that the subject-object asymmetry follows from formal properties of movement and Cyclic Linearization.

### 1.1 Initial Puzzle: Subject-Object Asymmetry in Scrambling

In Korean, quantity is expressed by a numeral quantifier (NQ) followed by a classifier. An NQ can be separated from its host NP in various contexts.<sup>1</sup> The paradigms in (1) and (2) illustrate a well-established asymmetry between the subject and the object in floating NQ constructions. As illustrated in (1), the subject may intervene between the object and the object-oriented NQ (NQ<sub>obj</sub>). By contrast, the object cannot intervene between the subject and the subject-oriented NQ (NQ<sub>subj</sub>), as illustrated in (2) (e.g., Lee 1993, Park and Sohn 1993, Kang 2002; see also, e.g., Haig 1980, Kuroda 1983, Saito 1985, Miyagawa 1989, Fujita 1994, for the same paradigm in Japanese).<sup>2</sup>

- (1) a. John-i      **maykcwu-lul sey-pyeng** masi-ess-ta.<sup>3</sup>  
 John-NOM beer-ACC      3-CL<sub>bottle</sub> drink-PAST-DEC  
 ‘John drank three bottles of beer.’  
 b. **Maykcwu-lul** John-i      **sey-pyeng** masi-ess-ta.  
 beer-ACC      John-NOM 3-CL      drink-PAST-DEC  
 ‘John drank three bottles of beer.’
- (2) a. **Haksayng-tul-i sey-myeng** maykcwu-lul masi-ess-ta.  
 student-PL-NOM 3-CL<sub>person</sub> beer-ACC      drink-PAST-DEC  
 ‘Three students drank beer.’

<sup>1</sup> Several types of NQ constructions exist in Korean. The NQ in (ia–b) cannot be separated from its host NP, whereas the NQ in (iia–b) can. (The plural marker *-tul* is optionally attached to an animate plural NP.) In this article, I focus primarily on type (iia) numerals; I turn to type (iib) constructions in section 5.

- (i) a. [haksayng(-tul) sey-myeng]-i      (ii) a. [haksayng(-tul)-i] [sey-myeng]  
 [student(-PL) 3-CL]-NOM      [student(-PL)-NOM] [3-CL]  
 b. [sey-myeng-uy haksayng(-tul)]-i      b. [haksayng(-tul)-i] [sey-myeng-i]  
 [3-CL-GEN student(-PL)]-NOM      [student(-PL)-NOM] [3-CL-NOM]

<sup>2</sup> If focus is imposed on *sey-myeng* ‘3-CL’ in (2b), or if (2b) is an answer to a question like *How many students drank beer?*, the grammaticality of (2b) improves, though (2b) is never comparable to (1b) (Kang 2002). This article deals primarily with the paradigms without focus (in an out-of-the-blue context); the effect of focus in NQ constructions is discussed briefly in section 5. See Kang 2002, Miyagawa and Arikawa 2004, Hoji and Ishii 2005, Ko 2005a, and references therein for further discussion of judgment variations about floating-NQ constructions in Korean and Japanese.

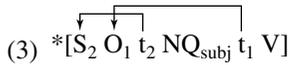
<sup>3</sup> I employ the Yale romanization to transliterate Korean examples (Martin 1992). Abbreviations for glosses are ACC (accusative), CL (classifier), C (complementizer), DAT (dative), DEC (declarative), FUT (future), HON (honorific), NEG (negation), NOM (nominative), PASS (passive), PAST (past), PL (plural), PRES (present), Q (question), TOP (topic). If necessary for reasons of space, unimportant morphemes are not glossed (e.g., *malhayess-ni* ‘said-Q’ instead of *malha-yess-ni* ‘say-PAST-Q’).

A subscript that appears with CL in the glosses (e.g., CL<sub>person</sub>) indicates that the classifier is used with a particular type of host noun. A subscript appears with CL the first time the particular classifier is used and is omitted thereafter.

- b. \***Haksayng-tul-i** maykcwu-lul sey-myeng masi-ess-ta.  
 student-PL-NOM beer-ACC 3-CL drink-PAST-DEC  
 ‘Three students drank beer.’

The grammaticality of (1b) is naturally expected under the assumption that the object may scramble over the subject and strand the  $NQ_{obj}$ , which has been merged as a sister of the object prior to scrambling (e.g., Kuroda 1983, Sportiche 1988).

The ungrammaticality of (2b), however, is puzzling, as pointed out by Saito (1985:211–212) for the same paradigm in Japanese. If the subject *haksayng-tul-i* ‘student-PL-NOM’ in (2b) can scramble over the scrambled object *maykcwu-lul* ‘beer-ACC’, as depicted in (3), there is no obvious reason why the subject cannot be separated by the object from its  $NQ_{subj}$  *sey-myeng* ‘3-CL’ in (2b) (cf. Miyagawa 1989).<sup>4</sup> Given this subject-object asymmetry, Saito argues that the subject cannot scramble at all (cf. Hoji 1985)<sup>5</sup> and thus cannot move to the left of the object in (2b).<sup>6</sup>



Contrary to the claim that there is a general ban on subject scrambling, however, there is some evidence that the subject can indeed scramble (e.g., Kurata 1991, Lee 1993, Sohn 1995, Ko 2005b). In particular, an embedded subject may scramble over a matrix subject (with some parsing difficulty), as illustrated in (4) (Lee 1993, Sohn 1995).<sup>7</sup> Furthermore, the embedded subject may strand an  $NQ_{subj}$  across the matrix subject, as shown in (5). If the subject cannot scramble at all, we expect (4) and (5) to be ungrammatical, contrary to the facts.

<sup>4</sup> As discussed in Ko 2005a, the mutual c-command condition proposed by Miyagawa (1989) is too weak to capture the ungrammaticality of (2b). If the subject may scramble over the scrambled object, as depicted in (3), the subject-oriented  $NQ$  would c-command the trace of the subject, satisfying the mutual c-command condition.

<sup>5</sup> Hoji (1985) independently argues that the subject cannot undergo string-vacuous scrambling, basing his claim on the fact that Japanese shows scope rigidity between the subject and the (unscrambled) object. I do not discuss scope rigidity here. Notice, however, that Hoji’s claim does not extend to (3). In (3), the result of multiple scrambling is not string-vacuous owing to the presence of the  $NQ_{subj}$ .

<sup>6</sup> Assuming that the subject is base-generated in Spec,IP, Saito (1985) argues that the subject cannot scramble because its trace cannot be lexically governed by the verb. Once we adopt the vP-Internal Subject Hypothesis (e.g., Kitagawa 1986, Kuroda 1988, Koopman and Sportiche 1991), however, the subject may move to Spec,IP over the scrambled object, leaving its trace lexically governed by the verb (via m-command), as in (i). Therefore, if (i) is allowed, (2b) remains puzzling. I thank Mamoru Saito (pers. comm.) for pointing this out to me.

(i)  $[IP \ Subj_1 [vP \ Obj_2 [v' \ t_1 \ NQ_{subj} [vP \ t_2 \ V] \ v]] \ T]$

<sup>7</sup> To avoid parsing difficulty, a topic-marked matrix subject is employed in (4) (see Sohn 1995 and references therein for parsing strategies in double nominative constructions). Saito (1985:188–189) argues that an embedded subject may precede a matrix (topic-marked) subject because the matrix subject is ‘‘downgraded’’ as a parenthetical expression into the embedded clause. Once downgrading is allowed, however, it is not clear why the scrambled object cannot downgrade between the subject and the  $NQ_{subj}$  in (2b). A reviewer also notes that this type of downgrading differs from derivation of a typical parenthetical expression in English such as (i). In (i), the entire matrix clause is assumed to be downgraded, whereas in (4), only the matrix subject (not the matrix verb) is assumed to be downgraded.

(i) John, I think, met Mary.

- (4)  $\overbrace{\text{John-}i_1 \text{ [CP na-nun [CP } t_1 \text{ Mary-lul mannassta-ko] sayngkakhanta].}$   
 John-NOM I-TOP Mary-ACC met-C think  
 ‘John<sub>1</sub>, I think that  $t_1$  met Mary.’  
 (adapted from Sohn 1995)

- (5)  $\overbrace{\text{Haksayng-tul-}i_1 \text{ [na-nun [} t_1 \text{ sey-myeng Mary-lul mannassta-ko] sayngkakhanta].}$   
 student-PL-NOM I-TOP 3-CL Mary-ACC met-C think  
 ‘Students<sub>1</sub>, I think that three  $t_1$  met Mary.’

Moreover, the subject may scramble clause-internally in certain contexts. For example, the subject may be separated from the  $\text{NQ}_{\text{subj}}$  by vP-external adverbs such as *pwunmyenghi* ‘evidently’ (6) and *way* ‘why’ (7).<sup>8</sup> (For convenience, I call vP-external adverbs *high adverbs* and vP-internal adverbs *low adverbs*. See section 2.3 for the distribution of low adverbs with respect to  $\text{NQ}_{\text{subj}}$ .) If the subject cannot scramble at all, we would expect (6) and (7) to be ungrammatical, contrary to the facts.

- (6)  $\overbrace{\text{Haksayng-tul-}i_1 \text{ pwunmyenghi } t_1 \text{ sey-myeng maykcwu-lul masiessta.}$   
 student-PL-NOM evidently 3-CL beer-ACC drank  
 ‘Evidently, three students drank beer.’

- (7)  $\overbrace{\text{Haksayng-tul-}i_1 \text{ way } t_1 \text{ sey-myeng hakkyo-lul ttenass-nunci anta.}$   
 student-PL-NOM why 3-CL school-ACC left-Q know  
 ‘(I) know why three students left the school.’

Note that the data in (4)–(7) can be straightforwardly explained if we assume that the subject can undergo scrambling. This, however, leaves the contrast between (1) and (2) unexplained.

In fact, the subject-object asymmetry is not limited to (1) and (2), which implies that we cannot simply resort to a stipulation for (2b).<sup>9</sup> The paradigms in (8)–(9) further confirm Saito’s insight that subject scrambling is impossible in certain contexts where the object also undergoes

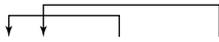
<sup>8</sup> In Ko 2005b, I argue that ‘why’ in *wh*-in-situ languages, including Korean (*way* ‘why’), Japanese (*naze* ‘why’), and Chinese (*weishenme* ‘why’), is externally merged in Spec,CP as a CP modifier. There, I provide various arguments that it is necessary to assume that the subject can scramble over ‘why’ in Spec,CP. In Ko 2006, I provide further evidence for this claim from acquisition of *wh*-questions in Korean. See also Miyagawa 1989, Ueda 1990, Fujita 1994, and Koizumi 1994, among others, for paradigms showing that high adverbs like temporal/locative adverbs may intervene between the subject and its NQ in Japanese.

<sup>9</sup> One may wonder whether (2b) can be explained on the assumption that a scrambled object at the vP edge triggers an intervention effect for subject scrambling (Noam Chomsky, pers.comm.). It is unclear, however, how the derivation in (i) can be excluded by this assumption. In (i), the object undergoes movement from VP to Spec,vP and from Spec,vP to Spec,CP. After object scrambling, the subject moves from Spec,vP to Spec,TP and eventually to the outer specifier of CP.

(i) [<sub>CP</sub> S O (Adv) [<sub>TP</sub>  $t_{\text{subj}}$  (Adv) [<sub>vP</sub>  $t_{\text{obj}}$   $t_{\text{subj}}$   $\text{NQ}_{\text{subj}}$   $t_{\text{obj}}$  V v] T] C]

Under proposals made in Chomsky 2000, 2001, the object in Spec,CP does not trigger an intervention effect for subject scrambling from Spec,TP to the outer specifier of C, as in (i). Thus, it remains puzzling why the order  $S < O < \text{NQ}_{\text{subj}}$  is not allowed in (2b) and (8). For extensive discussion, see Ko 2005a:app. 3A, where I present further arguments that intervention effects are too weak to capture the paradigms of subject scrambling.

scrambling. As illustrated in (8), when the subject and the object scramble together over an adverb, the subject *cannot* strand the  $NQ_{\text{subj}}$  to the right of the scrambled object and the adverb. In contrast, the object *can* strand the  $NQ_{\text{obj}}$  to the right of the scrambled subject and the adverb, as shown in (9).

- (8)   $?*[S_2 O_1 Adv t_2 NQ_{\text{subj}} t_1 V]$   
 ?\***Haksaying-tul-i**<sub>2</sub> maykcwu-lul<sub>1</sub> pwunmyenghi t<sub>2</sub> **sey-myeng** t<sub>1</sub> masiessta.  
 student-PL-NOM beer-ACC evidently 3-CL drank  
 ‘Evidently, three students drank beer.’

- (9)   $[O_1 S_2 Adv t_2 t_1 NQ_{\text{obj}} V]$   
 Maykcwu-lul<sub>1</sub> **haksaying-tul-i**<sub>2</sub> pwunmyenghi t<sub>2</sub> t<sub>1</sub> **sey-pyeng** masiessta.  
 beer-ACC student-PL-NOM evidently 3-CL drank  
 ‘Evidently, students drank three bottles of beer.’

The floating-NQ paradigms thus present the following puzzle: The subject can in principle undergo scrambling ((4)–(7)). However, the subject cannot strand its NQ across the object ((2), (8)), in the way the object strands its NQ across the subject ((1), (9)). In the next section, I propose a solution to this puzzle.

## 1.2 Proposal: Scrambling and Cyclic Linearization

As we have seen, there is no general ban on subject scrambling. In this section, I show that the restrictions on subject scrambling follow from general conditions on linearization and movement. Specifically, I argue that the subject-object asymmetry in floating-NQ constructions arises from the conspiracy of three factors: (a) information concerning linear orderings of syntactic units is sent to PF at each Spell-Out via *Cyclic Linearization*, (b) the subject is the specifier of a Spell-Out domain head  $v$ , and (c) NP and NQ form a constituent at the base position.

*1.2.1 Cyclic Linearization* I argue that linear ordering in constructions with scrambling is constrained by *Linearization Preservation* (10), which has been proposed by Fox and Pesetsky (2003; F&P, hereafter) as a consequence of cyclic Spell-Out (see also Fox and Pesetsky 2005a for detailed discussion of cyclic Spell-Out developed from Fox and Pesetsky 2003).

- (10) *Linearization Preservation* (Fox and Pesetsky 2003:1)

The linear ordering of syntactic units is affected by Merge and Move *within* a Spell-out Domain, but is fixed once and for all at the end of each Spell-out Domain.

F&P argue that certain syntactic domains created in a derivation are *Spell-Out domains*, which roughly correspond to Chomsky’s *phases*.<sup>10</sup> Spell-Out applies to Spell-Out domains cyclically. In

<sup>10</sup> Both F&P and Chomsky (2001) propose that certain domains undergo cyclic Spell-Out, but the two proposals differ from each other in their details. In this article, I adopt F&P’s Spell-Out system and present some differences between the two proposals when they are relevant to my arguments (see footnotes 11, 13, 15, and 22). For a comprehensive comparison of F&P’s and Chomsky’s Spell-Out, see Fox and Pesetsky 2005a and Ko 2005a.

particular, the cyclic Spell-Out operation establishes relative orderings among elements contained in a Spell-Out domain via *Cyclic Linearization*. The outcomes of Cyclic Linearization, *ordering statements*, are established in PF at each Spell-Out. An ordering statement of the form  $\alpha < \beta$  is understood by PF as meaning that the last element of  $\alpha$  precedes the first element of  $\beta$ , excluding traces.<sup>11</sup>

F&P argue that Linearization Preservation (10) follows from a fundamental property of cyclic Spell-Out: *Spell-Out may add new ordering statements but cannot erase ordering statements established in the previous domain*. The sole function of Spell-Out is to *add* information (Fox and Pesetsky 2005a:6). Given that ordering statements established in each cycle cannot be erased at PF, it follows that ordering information in an earlier domain must be consistent with ordering information added in a later domain, in order to avoid an ordering contradiction. As F&P stress, Linearization Preservation is not an additional constraint in syntax, but a consequence of cyclic Spell-Out, which forces monotonicity of the syntactic derivation.

As an example, consider the derivation in (11), under Cyclic Linearization.

- (11) a. [<sub>vP</sub> X Y]: X < Y  
       b. [<sub>CP</sub> X<sub>1</sub> Z [<sub>vP</sub> t<sub>1</sub> Y]]: X < Z < vP ⇒ X < Z < Y

In (11a), X precedes Y in the vP domain. Once vP is spelled out, the linear ordering X < Y is established in PF. This ordering cannot be erased or changed, as stated in (10). As described in (11b), suppose that a new element Z is merged in the higher domain CP and that the element X merged in vP is remerged in CP (i.e., X undergoes overt movement in CP). After CP is spelled out, the new orderings X < Z < vP are added in PF. Since the first (overt) element in vP is Y, PF obtains new linearization information, X < Z < Y.<sup>12</sup> Given that the ordering in CP (X < Z < Y) is *consistent* with the one in vP (X < Y), the derivation in (11b) poses no problem for PF. Thus, movement of X in (11b) is correctly allowed under Cyclic Linearization.

As F&P discuss, an interesting issue arises concerning derivations like (12). Suppose that X precedes Y in vP, as in (12a). Also suppose that Z is merged in the higher domain CP and that Y undergoes movement over Z, as in (12b). When the CP in (12b) is spelled out, PF obtains the information that Y < Z and Z < vP. Since X is the first element in vP, Z precedes X. Given that Y precedes Z and Z precedes X, Y must precede X in CP.

<sup>11</sup> In this article, I present only the core ideas of the Cyclic Linearization framework that I adopt to explain the paradigms with scrambling. See Fox and Pesetsky 2005a,b for the original descriptions of Cyclic Linearization. Note, in particular, that under F&P's proposals, both the specifier and the complement of a Spell-Out domain head are linearized via Spell-Out (cf. Chomsky's (2001) argument that only the complement of a phase head is spelled out). For instance, if vP is a Spell-Out domain, both S (specifier) and O (complement) are linearized with respect to the verb (the head) at the spell-out of vP. I adopt F&P's assumption here.

<sup>12</sup> Strictly speaking, the ordering statement added in (11b) is "Z precedes the first nontrace element of vP, namely, Y." For ease of exposition, however, I also present the ordering of terminals for each Spell-Out domain. X < Z < Y in (11b) is my notation for the total ordering {X < Z, X < Y, Z < Y}. Fox and Pesetsky (2005a:40–42) offer a more elaborate statement of the formal properties of the collection of orderings in the ordering table in PF.

- (12) a.  $[_{VP} X Y]: X < Y$   
           ↓                   ↓  
       b.  $*[_{CP} Y_1 Z [_{VP} X t_1]]: Y < Z < vP \Rightarrow Y < Z < X$

Notice, however, that this ordering in CP ( $Y < Z < X$ ) *contradicts* the ordering established in vP ( $X < Y$ ). The ordering in vP indicates that X precedes Y. The ordering in CP indicates that Y precedes X. Derivations like (12b) with an ordering contradiction thus cannot be pronounced and are filtered out at PF.

If the ordering  $Y < X$  is to be derived from (12a), Y must move to the left of X *before* the spell-out of vP, as illustrated in (13a).<sup>13</sup> Crucially, this implies that the revised ordering in (13a) ( $Y < X$ ) needs to be preserved in the higher domain, as in the case of (13b). Otherwise, an ordering contradiction would arise, and the derivation could not be pronounced at PF.

- (13) a.  $[_{VP} Y_1 [X t_1]]: Y < X$   
           ↓                   ↓  
       b.  $[_{CP} Y_1 Z [_{VP} t_1 [X t_1]]]: Y < Z < vP \Rightarrow Y < Z < X$

F&P show that this formal mechanism for linearization provides a unified account for a variety of order preservation phenomena, including object shift in Scandinavian languages. The object in Scandinavian languages may move out of VP (crossing adverbs and negation) only when all the overt elements that preceded it in VP continue to precede it after it shifts (see Holmberg 1999, Müller 2000, Chomsky 2001, Sells 2001, Williams 2003). Under Cyclic Linearization, this generalization follows from the hypothesis that the ordering in the VP domain must be consistent with the ordering in the CP domain.

For instance, *henne* ‘her’ in (14a) may undergo object shift because the verb *kysste* ‘kiss’ that preceded *henne* ‘her’ in VP continues to precede the shifted object in CP (as a result of V-to-C movement in (14a)). By contrast, *henne* ‘her’ in (14b) cannot undergo object shift because the verb *kysste* ‘kiss’ that preceded *henne* ‘her’ in VP does *not* precede the shifted object in CP (owing to the unavailability of V-to-C movement in (14b), where the auxiliary *har* ‘have’ blocks such movement).<sup>14</sup>

- (14) a.  $Jag\ kysste_1\ henne_2\ inte\ [_{VP}\ t_1\ t_2].$   
           I    kissed  her     not  
           ‘I did not kiss her.’

<sup>13</sup> As F&P discuss, the contrast between (12) and (13) shows that their Cyclic Linearization derives the “successive cyclicity” of certain types of movement (e.g., *wh*-movement) without invoking Chomsky’s (2001) Phase Impenetrability Condition.

<sup>14</sup> As Fox and Pesetsky (2005a) discuss, this analysis crucially assumes that VPs are Spell-Out domains in Scandinavian languages and that the object in (14) cannot move to the edge of VP *before* spell-out of VP (cf. discussion of (18) for object scrambling).

- b. \*Jag har henne<sub>2</sub> inte [<sub>VP</sub> kysst t<sub>2</sub>].  
 I have her not kissed  
 ‘I have not kissed her.’  
 (Swedish; Fox and Pesetsky 2005a:17)

*1.2.2 A Theory of Scrambling* Returning to our discussion of scrambling, if Cyclic Linearization restricts the linear ordering of syntactic units at the interface, we expect that the linear ordering in constructions with scrambling will also be constrained by the interface properties, just as constructions with object shift are. I argue that this is indeed the case. Specifically, linearization information about scrambling is sent to the phonology at each Spell-Out, and subsequent scrambling must preserve the linear orderings established in previous domains to avoid an ordering contradiction at PF.

In developing a theory of scrambling under the Cyclic Linearization framework, I adopt the following assumptions. I assume that vP and CP constitute Spell-Out domains in Korean (but see Ko 2005a for further discussion).<sup>15</sup> I take scrambling to be a feature-driven movement (see, e.g., Miyagawa 1997, 2001, Grewendorf and Sabel 1999, Sabel 2001, and Kitahara 2002 for similar approaches). In particular, I argue that scrambling is an operation that moves a maximal projection to the specifier of a head that triggers scrambling with a certain feature (for concreteness, I call this an *EPP feature*). When multiple scrambling is triggered by one head, elements move to multiple specifiers of the triggering head (Ura 1996, 2000, Richards 1997, 2001). Scrambling may occur optionally, meaning that a head may optionally acquire an EPP feature that triggers scrambling.<sup>16</sup>

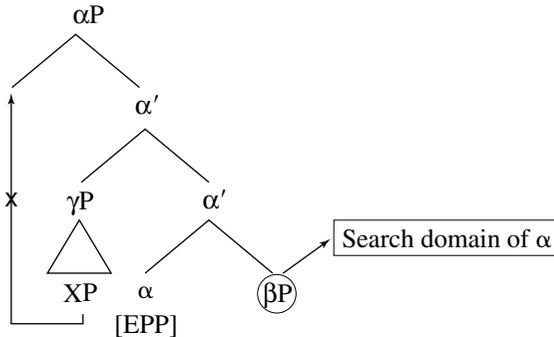
An immediate consequence of this approach is that scrambling is constrained by the general properties of feature-driven movement. I argue with Chomsky (2000, 2001) that feature-driven movement is allowed only when a legitimate probe-goal relationship is established. Specifically, a probe may search for a goal only under strict c-command. On this view, *an XP may undergo scrambling only when a probe with an EPP feature c-commands the goal XP*.

<sup>15</sup> What constitutes a Spell-Out domain in natural languages in general is in fact a controversial question. Chomsky proposes that Spell-Out applies only to “propositional” phases, namely, vP and CP (but see Matushansky 2005 for counterarguments). Others argue that other maximal projections such as VP, PP, and AppP can also be Spell-Out domains (see, e.g., McGinnis 2001, Abels 2003, Fox and Pesetsky 2003, 2005a,b, Sabbagh 2003, Ko 2005a, and Lee-Schoenfeld 2005, for discussion). In this article, I do not provide any insightful answer for this question. Rather, I simply adopt the assumption that vP and CP are Spell-Out domains for Korean, and I focus on investigating the consequences of this assumption for scrambling. I also remain open to the possibility that other maximal projections can be Spell-Out domains. In Ko 2005a:chap. 3, I suggest that the domains of  $\theta$ -role assigners (VP and vP) and  $\theta$ -role assignees (DP and CP) are Spell-Out domains, on the basis of interactions between object scrambling and secondary predicates. Nothing in this article, however, is crucially affected by this modification. See section 6 for a general discussion of Spell-Out domains.

<sup>16</sup> For the sake of space, I omit technical details regarding implementation of the EPP feature. See Ko 2005a for detailed description. In particular, I assume that assignment of an EPP feature is optional, but the operation triggered by the EPP feature is obligatory. This is essentially the view taken by Grewendorf and Sabel (1999) under slightly different assumptions. The question of why scrambling is optional is not pursued further here. See Saito 1985, Fukui 1986, 1993, Kuroda 1988, Tada 1993, Miyagawa 1997, 2001, Bošković and Takahashi 1998, Saito and Fukui 1998, Takano 1998, Bailyn 2001, Boeckx 2003, and Yang and Kim 2005, among many others, for diverse perspectives on optionality of scrambling.

Importantly, this claim implies that no scrambling is allowed from one specifier of a head  $\alpha$  to another specifier of  $\alpha$  (but see also Rezac 2003, Richards 2004 for potentially opposing considerations). Given that a probe can search only into its c-command domain, a specifier of a head  $\alpha$  is not in the search domain of the head  $\alpha$ . Consequently, no movement can be triggered from a specifier of the head  $\alpha$  to another specifier of  $\alpha$ , as illustrated in (15). As will be seen shortly, this formal property of scrambling has an important consequence for the syntax of subject scrambling.

(15) *Illegal scrambling*



Finally, following Sportiche (1988), I argue that an NQ and its host NP are externally merged as a constituent.<sup>17</sup> In section 5, I discuss the implications of this claim for Cyclic Linearization. For current purposes, it suffices to say that this assumption will play a role in blocking some illicit movement of an object (see footnotes 21, 28).

### 1.3 Analysis

Under the theory of scrambling proposed above, in this section I analyze the paradigms of object scrambling, subject scrambling, and multiple scrambling; I also resolve the subject-object asymmetry puzzle presented in the previous section.<sup>18</sup>

*1.3.1 Object Scrambling* Consider first the basic paradigm of object scrambling in (1b) (repeated here).

- (16)  $\overbrace{[O_1 S t_1 NQ_{obj} V]}$   
**Maykcwu-lul<sub>1</sub> John-i t<sub>1</sub> sey-pyeng masi-ess-ta.**  
 beer-ACC John-NOM 3-CL drink-PAST-DEC  
 ‘John drank three bottles of beer.’

<sup>17</sup> See Kuroda 1983, Déprez 1989, Ueda 1990, Shlonsky 1991, Merchant 1996, Benmamoun 1999, Cinque 1999, McCloskey 2000, and Bošković 2004, among others, for similar approaches. See Dowty and Brodie 1984, Miyagawa 1989, Fukushima 1991, Fujita 1994, Bobaljik 1995, 2003, and Brisson 1998, among others, for alternative approaches.

<sup>18</sup> In this article, I do not discuss the interactions between double object constructions and Cyclic Linearization. See Ko 2005a:chap. 3 for a comprehensive discussion devoted to this topic. Nothing in this article hinges crucially on the arguments developed there.

When object scrambling occurs, the object first scrambles over the subject to the outer specifier of vP, as in (17) (see Kitahara 2002, Lee and Cho 2004 for similar proposals). When the vP is spelled out, the elements of vP are linearized and the ordering in vP ( $O < S < NQ_{obj} < V < v$ ) is established in PF.

$$(17) \left[ {}_{vP} O_1 \left[ {}_{v'} S t_1 NQ_{obj} V v \right] \right]$$

Linearize vP:  $O < S < NQ_{obj} < V < v$

After linearization of vP, new heads are introduced. The syntax continues to merge and remerge elements. As illustrated in (18), the object in Spec,vP may scramble further to Spec,TP.<sup>19</sup> When the higher-domain CP is spelled out, the ordering statements in CP in (18) are established ( $O < vP < T < C$ ). Since the ordering statements in vP and CP are *consistent*, the derivation poses no problem for PF.

$$(18) \left[ {}_{CP} [{}_{TP} O_1 \left[ {}_{vP} t_1 \left[ {}_{v'} S t_1 NQ_{obj} V v \right] T \right] C \right]$$

Linearize CP:  $O < vP < T < C \Rightarrow$  Ordering in CP:  $O < S < NQ_{obj} < V < v < T < C$

For clarification, I would add that if the object does not undergo scrambling in the vP domain, the ordering in the vP domain ( $S < O$ ) will contradict the ordering in the CP domain ( $O < S$ ). Hence, the derivation will be ruled out at PF. On this view, object shift in (14) and object scrambling in (16) crucially differ in that scrambling allows movement through the *edge*, but object shift does not. (I thank a reviewer for clarifying this point.)

*1.3.2 Subject Scrambling* As with the object-scrambling paradigm, we have seen that the subject can scramble and license the  $NQ_{subj}$  over a high adverb, as demonstrated in (6)–(7) ((6) is repeated here).

$$(19) \left[ S_1 Adv t_1 NQ_{subj} O V \right]$$

**Haksayng-tul-i<sub>1</sub> pwunmyenghi t<sub>1</sub> sey-myeng maykcwu-lul masiessta.**  
 student-PL-NOM evidently 3-CL beer-ACC drank  
 ‘Evidently, three students drank beer.’

Under Cyclic Linearization, (19) is derived as follows. When the vP structure of (19) is projected and spelled out, the ordering statements for the vP domain are established ( $S < NQ_{subj} < O < V < v$ ), as given in (20a).

Given that high adverbs such as *pwunmyenghi* ‘evidently’ and *way* ‘why’ are externally merged outside vP, they do not participate in the linearization of vP (cf. section 2.3 for low adverbs merged within vP). After a high adverb is merged, the subject moves to the left of

<sup>19</sup> See Mahajan 1990, Saito 1992, and Sohn 1995 for object scrambling to Spec,TP. For current purposes, it does not matter whether the object *must* or *can* scramble to Spec,TP (cf. Miyagawa 1997). Also, it does not matter for my proposals whether fully inflected words (e.g., *mek-ess-ta* ‘eat-PAST-DEC’) are inserted into the syntax, or whether bound morphemes (e.g., *ess* ‘PAST’, *ta* ‘DEC’) are combined with their host via head movement or morphological merger.

the adverb and the CP is spelled out. Then the ordering statements in CP are established ( $S < Adv < vP < T < C$ ), as given in (20b).

- (20) a.  $[_{vP} S NQ_{subj} O V v]$   
           Linearize vP:  $\underline{S < NQ_{subj} < O < V < v}$   
                           ↓  
       b.  $[_{CP} S_1 Adv [_{TP} t_1 [_{vP} t_1 NQ_{subj} O V v] T] C]$   
           Linearize CP:  $\underline{S < Adv < vP < T < C}$   
            $\Rightarrow$  Ordering in CP:  $\underline{S < Adv < NQ_{subj} < O < V < v < T < C}$

The linearization of CP adds new ordering statements (e.g.,  $S < Adv < NQ_{subj}$ ), but crucially there is no contradiction between the ordering in vP and the ordering in CP. Hence, the derivation poses no problem for PF.

The analysis for (19) straightforwardly extends to the examples in (4)–(5), where the embedded subject moves to the left of the matrix subject. The derivations in (21) illustrate how (5) can be derived under Cyclic Linearization.

- (21) a.  $[_{vP} S_e NQ_{subj} O V_e v_e]$   
           Ordering in the embedded vP:  $\underline{S_e < NQ_{subj} < O < V_e < v_e}$   
                           ↓  
       b.  $[_{CP}[_{TP} S_{e_1} [_{vP} t_1 NQ_{subj} O V_e v_e] T_e] C_e]^{20}$   
           Ordering in the embedded CP:  $\underline{S_e < NQ_{subj} < O < V_e < v_e < T_e < C_e}$   
                           ↓  
       c.  $[_{vP} S_{e_1} [_{v'} S_m [_{CP}[_{TP} t_1 [_{vP} t_1 NQ_{subj} O V_e v_e] T_e] C_e] V_m v_m]]$   
           Ordering in the matrix vP:  $\underline{S_e < S_m < NQ_{subj} < O < V_e < v_e < T_e < C_e < V_m < v_m}$   
                           ↓  
       d.  $[_{CP}[_{TP} S_e [_{vP} t_{e_1} [_{v'} S_m [_{CP}[_{TP} t_1 [_{vP} t_1 NQ_{subj} O V_e v_e] T_e] C_e] V_m v_m]] T_m] C_m]$   
           Ordering in the matrix CP:  $\underline{S_e < S_m < NQ_{subj} < O < V_e < v_e < T_e < C_e < V_m < v_m < T_m < C_m}$

*1.3.3 Multiple Scrambling: Subject-Object Asymmetry Puzzles* Now recall the subject-object asymmetry in scrambling: the subject can scramble alone and license its NQ, but when both the subject and the object scramble, preserving their initial order, the subject cannot strand an  $NQ_{subj}$  across the object ((2), (8)). The object, by contrast, can strand its NQ whether it scrambles alone (1) or scrambles together with the subject (9). In what follows, I show that a solution to this puzzle follows from Cyclic Linearization and the theory of scrambling proposed above.

Consider first the ungrammatical paradigm of multiple scrambling (22).

- (22) *Illicit multiple scrambling*  
           ↓  
       ?\*[ $S_2 O_1 (Adv) t_2 NQ_{subj} t_1 V$ ] (see (2) and (8) for examples)

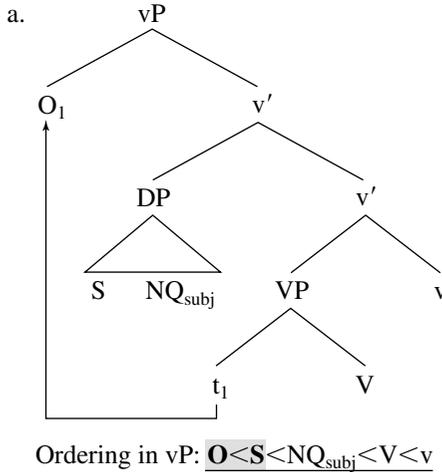
<sup>20</sup> To clarify: it does not matter for linearization whether the subject in (21b) stays in Spec,vP or moves to Spec,TP (cf. Miyagawa 2001, where it is argued that the subject must move to Spec,TP in contexts like (21b)). The same concern applies to (21d).

When the argument structure of (22) is projected, the underlying order in (23) is obtained. Given that scrambling may occur optionally in vP, we need to consider two logical possibilities: (a) *case 1*, in which the object scrambles in vP, (b) *case 2*, in which the object does not scramble in vP. Crucially, given that the subject is externally merged in Spec,vP, the subject cannot scramble within vP (recall (15)). Let us start the discussion with case 1, demonstrated in (24).

(23) *Underlying order projected from the argument structure*

[<sub>vP</sub> S NQ<sub>subj</sub> O V v]

(24) *Case 1: The object does scramble in vP*



b. [<sub>CP</sub> O<sub>1</sub> Adv [<sub>vP</sub> t<sub>1</sub> [<sub>v'</sub> S NQ<sub>subj</sub> t<sub>1</sub> V v]]] T C]

c. [<sub>CP</sub> S<sub>2</sub> O<sub>1</sub> Adv [<sub>vP</sub> t<sub>1</sub> [<sub>v'</sub> t<sub>2</sub> NQ<sub>subj</sub> t<sub>1</sub> V v]]] T C]

Ordering in CP: **S**<O<Adv<NQ<sub>subj</sub><V<v<T<C [ordering contradiction!]

As illustrated in (24a), when the object undergoes scrambling to the left of the subject (moving to the outer specifier of the vP), the object also scrambles to the left of the NQ<sub>subj</sub>. Since the subject and NQ<sub>subj</sub> form a constituent within a DP, the object cannot move into a DP-internal position between S and NQ<sub>subj</sub>. When the vP is spelled out, the ordering in (24a) is established (O<S<NQ<sub>subj</sub><V<v). Note crucially that the scrambled object must precede *both* the subject and the NQ<sub>subj</sub> in the vP.<sup>21</sup>

After the spell-out of vP, the object may move further to the left of the high adverb in the next Spell-Out domain, as in (24b). Suppose now that to create the word order in (22), the subject

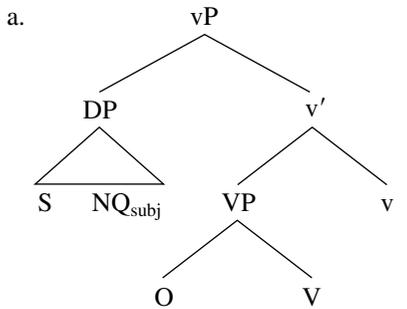
<sup>21</sup> If the subject and the NQ<sub>subj</sub> did not form a constituent in vP, the object might move into a position between S and NQ<sub>subj</sub> in the vP domain, and the illicit order S<O<NQ<sub>subj</sub> would be permitted, incorrectly. Hence, to the extent that my analysis is correct, it supports the view that NP and NQ form a constituent in their base position (see also footnote 28). In section 5, I claim that this argument is further supported by the fact that floating quantifiers that plausibly do not form a constituent with their host NP indeed allow the linear ordering S<O<QP<sub>subj</sub>.

moves over the scrambled object, as described in (24c). When the CP in (24c) is spelled out, the ordering statements in (24c) are established.

Notice that the new orderings added in the CP domain are *inconsistent* with the orderings established in the vP domain. In particular, in the vP domain, the ordering statements indicate that O precedes S. However, in the CP domain, the ordering statements indicate that S precedes O. Hence, an ordering contradiction arises for the phonology and this structure cannot be pronounced at PF.

Now let us turn to case 2, illustrated in (25), where the object does not undergo scrambling in vP.

(25) *Case 2: The object does not scramble in vP*



Ordering in vP: S < NQ<sub>subj</sub> < O < V < v

b.  $[_{CP} S_2 O_1 Adv [_{vP} t_2 NQ_{subj} t_1 V v] T C]^{22}$

Ordering in CP: S < O < Adv < NQ<sub>subj</sub> < V < v < T < C [ordering contradiction!]

When the vP domain is spelled out, the linear ordering in (25a) is established ( $S < NQ_{subj} < O < V < v$ ). Crucially, if the object does not undergo scrambling, the object follows both the subject and the  $NQ_{subj}$  in the vP domain. After the spell-out of vP, a high adverb is merged in the higher Spell-Out domain CP. Suppose now that to create the linear ordering in (22), the subject and the object undergo scrambling over the high adverb. When the CP is spelled out, the orderings in (25b) are established in PF ( $S < O < Adv < NQ_{subj} < V < v < T < C$ ).

The new ordering statements in the CP domain are again inconsistent with the orderings established in the vP domain. In particular, in the vP domain, the ordering statements indicate that  $NQ_{subj}$  precedes O. However, in the CP domain, the ordering statements indicate that O precedes  $NQ_{subj}$ . Hence, an ordering contradiction arises for the phonology and this derivation cannot be pronounced at PF.

In short, whether the object undergoes vP-scrambling (24) or not (25), the object cannot intervene between the subject and the  $NQ_{subj}$  under Cyclic Linearization. If the object scrambles

<sup>22</sup> Under F&P's proposals, elements in *nonedge* position of the Spell-Out domain may move to the higher domain as long as the movement yields no ordering contradiction at PF (cf. Chomsky 2001). Thus, the fact that the object in VP (nonedge position) moves to the left of the high adverb in (25b) is irrelevant in deciding the grammatical status of (25b).

in vP, it must precede both the subject and the  $NQ_{\text{subj}}$ . If the object does not scramble in vP, it must follow both the subject and the  $NQ_{\text{subj}}$ .

One of the crucial assumptions of the current analysis is that the subject is directly merged in Spec,vP and thus cannot vP-scramble. If the subject were able to scramble from the inner specifier to the outer specifier of v (to the left of the scrambled object within the vP), as in (26), the linear ordering in (22) would be incorrectly allowed. Under my approach, (26) is ruled out by consideration of what is a possible probe-goal relationship. Specifically, Spec,vP is not in the search space (c-command domain) of v (Chomsky 2001); hence, no scrambling is possible from Spec,vP to Spec,vP. (In section 3, I show that a subject that is not externally merged in Spec,vP behaves differently.) Thus, to the extent that my analysis is successful, it provides further support for the thesis that scrambling is triggered by a c-commanding (probing) head.<sup>23</sup>

(26) *Unavailable scenario*: subject scrambling from Spec,vP to Spec,vP

$$*[_{\text{vP}} S_2 [_{v'} O_1 [_{v'} [_{\text{DP}} t_2 NQ_{\text{subj}}] [_{\text{VP}} t_1 V] v]]]$$

Linearize vP: S<O<NQ<sub>subj</sub><V<v [impossible movement!]

Under the present proposal, the crucial contrast between the subject and the object in (8) and (9) follows directly from the fact that the object is *not* externally merged in the specifier of the Spell-Out domain head v. Since there is a head (i.e., v) that can attract the object over the subject in the vP domain, the object may scramble to the left of the subject *before* the spell-out of vP. Hence, the subject may intervene between the object and the  $NQ_{\text{obj}}$ . This is demonstrated in (27), for (9) with licit multiple scrambling (cf. (22) with illicit multiple scrambling).<sup>24</sup>

(27) *Licit multiple scrambling*

$$\text{a. } [_{\text{vP}} O_1 [_{v'} S t_1 NQ_{\text{obj}} V v]]$$

Ordering in vP: O<S<NQ<sub>obj</sub><V<v

$$\text{b. } [_{\text{CP}} O_1 S_2 Adv [_{\text{vP}} t_1 [_{v'} t_2 t_1 NQ_{\text{obj}} V v]] T C]$$

Ordering in CP: O<S<Adv<NQ<sub>obj</sub><V<v<T<C

In this section, we have seen that there is no “ban on subject scrambling.” Rather, the subject-object asymmetry in scrambling follows from a condition on movement (a *probe-goal*

<sup>23</sup> To accommodate my arguments within an approach that does not assume a probe-goal relationship in scrambling, one needs to postulate an extra constraint to block (26). Note in particular that an antilocality constraint like (i) cannot capture the ungrammaticality of (26) (see Bošković 1994, 2005, Saito and Murasugi 1999, Abels 2003, and Lee 2004 for antilocality constraints). Since the movement of the subject NP from inside DP to Spec,vP in (26) crosses a maximal projection, DP, (26) would be ruled in under (i).

(i) Each chain link must be at least of length 1, where a chain link from A to B is of length  $n$  if there are  $n$  XPs that dominate B but not A. (Bošković 2005:16)

<sup>24</sup> The analysis presented in (27) assumes that the subject and the object both scramble individually (rather than together). I leave it open whether (27) can be made compatible with the claim that multiple scrambling is the result of a derivation where one item adjoins to the other and subsequently those combined items scramble together. I thank a reviewer for clarifying this point.

relationship) and Cyclic Linearization of syntactic units. Cyclic Linearization requires the linear ordering between elements in a Spell-Out domain  $vP$  to be fixed when the  $vP$  is spelled out. Given that a probe-goal relationship and a constituency between the subject and its NQ block the order  $S < O < NQ_{subj}$  within  $vP$ , it follows that the object cannot intervene between the subject and its NQ in the higher domains either. In the remainder of the article, I provide various arguments supporting this account.

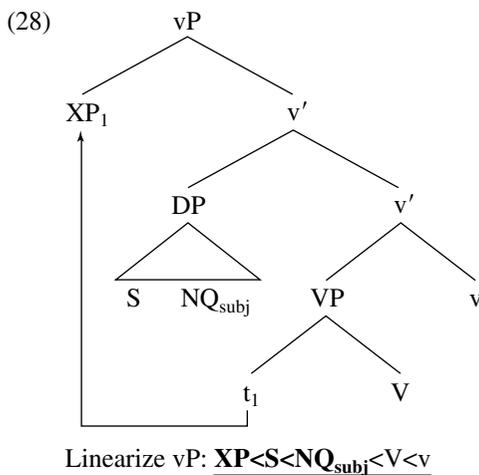
In particular, I demonstrate that a variety of otherwise surprising asymmetries in scrambling can receive a principled account along the same lines. The evidence comes from subject versus nonsubject asymmetry (section 2.2), high versus low adverb asymmetry (section 2.3), unaccusative/passive versus unergative asymmetry (section 3), various types of asymmetries in possessor-raising constructions (section 4), and asymmetries between two distinct types of floating quantifiers (section 5). If successful, my arguments provide novel evidence for the thesis that the architecture of grammar requires linearization in phonology to be cyclically determined by the syntax.

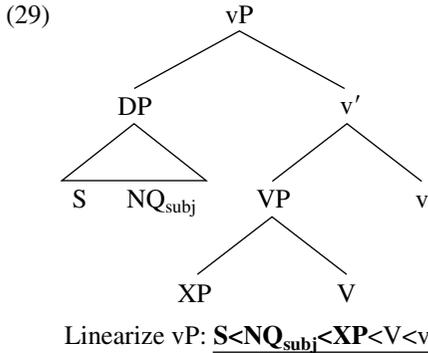
## 2 Subject versus Nonsubject Asymmetry

In this section, I argue that every element base-generated within  $vP$  behaves like an object in its syntactic distribution with respect to the subject and  $NQ_{subj}$ . I demonstrate that this generalization is predicted by the Cyclic Linearization approach to scrambling.

### 2.1 Prediction

Thus far, I have argued that the subject does not undergo scrambling within  $vP$  because it is externally merged in the specifier of a Spell-Out domain head  $v$ . This argument makes the following prediction: *no element that is base-generated in  $vP$  can intervene between the subject and its associate  $NQ$* . Consider (28) and (29) for detailed description.





As schematized in (28), if a nonsubject element undergoes scrambling in vP, it must scramble to the left of both the subject and the NQ<sub>subj</sub>. If a nonsubject element does not undergo scrambling, as in (29), it must follow both the subject and the NQ<sub>subj</sub>. The subject merged in Spec,vP cannot move to revise these two possible orderings within vP. Therefore, given Linearization Preservation, we predict that a nonsubject element in vP cannot separate the subject and the NQ<sub>subj</sub>. To put it differently, the subject-object asymmetry discussed above is just a particular instance of this prediction. In what follows, I show that this prediction is borne out by various tests.

## 2.2 vP-Internal Arguments

As predicted, vP-internal arguments uniformly cannot split the subject and its associate NQ<sub>subj</sub>. This is illustrated by (30), where the relevant argument is an indirect object, and also by (31), where the relevant argument is a PP.<sup>25</sup>

- (30) a. **Haksayng-tul-i sey-myeng** Mary-eykey maykcwu-lul cwu-ess-ta.  
 student-PL-NOM 3-CL Mary-DAT beer-ACC give-PAST-DEC  
 ‘Three students gave Mary beer.’
- b. ?\***Haksayng-tul-i** Mary-eykey **sey-myeng** maykcwu-lul cwu-ess-ta.  
 student-PL-NOM Mary-DAT 3-CL beer-ACC give-PAST-DEC  
 ‘Three students gave Mary beer.’

<sup>25</sup> As expected, sentences like (i) and (ii), where two vP-internal XPs intervene between S and NQ<sub>subj</sub>, are also ungrammatical. (The sentences in (30b) and (31b) are slightly less degraded than the sentences in (i) and (ii). I do not have an account of this contrast.)

- (i) \***Haksayng-tul-i** Mary-eykey maykcwu-lul **sey-myeng** cwu-ess-ta.  
 student-PL-NOM Mary-DAT beer-ACC 3-CL give-PAST-DEC  
 ‘Three students gave Mary beer.’
- (ii) \***Haksayng-tul-i** maykcwu-lul kyosil-lo **sey-myeng** kacye-wa-ss-ta.  
 student-PL-NOM beer-ACC classroom-to 3-CL bring-PAST-DEC  
 ‘Three students brought beer to the classroom.’

- (31) a. **Haksayng-tul-i sey-myeng** maykcwu-lul kyosil-lo kacyewa-ss-ta.  
 student-PL-NOM 3-CL beer-ACC classroom-to bring-PAST-DEC  
 ‘Three students brought beer to the classroom.’
- b. ?\***Haksayng-tul-i** kyosil-lo **sey-myeng** maykcwu-lul kacyewa-ss-ta.  
 student-PL-NOM classroom-to 3-CL beer-ACC bring-PAST-DEC  
 ‘Three students brought beer to the classroom.’

### 2.3 High (vP-External) versus Low (vP-Internal) Adjunct Asymmetry

We have seen that the subject and the  $NQ_{\text{subj}}$  can be separated by a high adverb merged outside vP, as in (6)–(7). This is because a high adverb is not linearized with respect to the subject at the spell-out of vP. The subject can move over the high adverb in the higher-domain CP and add a *new* ordering statement that the subject precedes the high adverb.

Now let us consider a low adverb merged *within* vP. Since the low adverb is introduced before the spell-out of vP, the subject must be linearized with respect to the low adverb in vP, as in the case of IO, DO, and PP. We then predict that the subject and the  $NQ_{\text{subj}}$  cannot be separated by the low adverb, in contrast to what we find in the high adverb paradigms. This prediction is borne out.

As illustrated in (32a), a low adverb, such as *ilpwule* ‘deliberately’, cannot intervene between the subject and its  $NQ_{\text{subj}}$ , in contrast to the high adverb *pwunmyenghi* ‘evidently’ in (32b) (see also Miyagawa 1989 and Fujita 1994, among others, for a similar observation in Japanese concerning low adjuncts like instrumental and manner adverbs).

- (32) a. ?\***Haksayng-tul-i ilpwule** **sey-myeng** kong-ul pat-ass-ta.  
 student-PL-NOM deliberately 3-CL ball-ACC receive-PAST-DEC  
 ‘Three students received a ball deliberately.’<sup>26</sup>
- b. **Haksayng-tul-i pwunmyenghi** **sey-myeng** kong-ul pat-ass-ta.  
 student-PL-NOM evidently 3-CL ball-ACC receive-PAST-DEC  
 ‘Evidently, three students received a ball.’

This high-low adjunct asymmetry can be verified by testing contrasts between other types of high and low adjuncts, listed in (33). (For convenience, I use the terms *adverb* and *adverb phrase* interchangeably.)

<sup>26</sup> David Pesetsky (pers. comm.) notes that *deliberately* in English can be ambiguous.

(i) The students *deliberately* took that test on Thursday.

On one reading, (i) means that the students made a deliberate decision, so that they took the test on Thursday. On the other reading, (i) means that someone else (e.g., an instructor) made a deliberate decision, so that the students took the test on Thursday. (But some English speakers (Norvin Richards, pers. comm.; an anonymous *LI* reviewer, pers. comm.) accept only the former reading.) Korean *ilpwule* ‘deliberately’ allows only the former reading where the subject is the agent of the deliberate decision.

- (33) a. ?\*[S *low adjunct* NQ<sub>subj</sub> O V]  
 Manner adverb/PP (e.g., *ppalli* ‘quickly’, *yelsimhi* ‘diligently’)  
 Instrumental adverb/PP (e.g., *phoku-lo* ‘fork-with’)  
 Resultative adverb/PP (e.g., *sansancokak-ulo* ‘into three pieces’)
- b. [S *high adjunct* NQ<sub>subj</sub> O V]<sup>27</sup>  
 Sentential adverb/PP (e.g., *pwunmyenghi* ‘evidently’, *amato* ‘probably’)  
 Temporal/locative adverb/PP (e.g., *ecey* ‘yesterday’, *kekise* ‘there’)  
 Speaker-oriented adverb/PP (e.g., *nollapkeyto* ‘to my surprise’)

Interestingly, the high-low adjunct asymmetry with respect to an NQ<sub>subj</sub> in (32)–(33) disappears when the sentence instead has an object-oriented NQ<sub>obj</sub>, as in (34).

- (34) a. **Kong-ul** haksayng-tul-i *ilpwule* **sey-kay** pat-ass-ta.  
 ball-ACC student-PL-NOM deliberately 3-CL<sub>thing</sub> receive-PAST-DEC  
 ‘Students received three balls deliberately.’
- b. **Kong-ul** haksayng-tul-i *amato* **sey-kay** pat-ass-ulkes-ita.  
 ball-ACC student-PL-NOM probably 3-CL receive-PAST-likely-be  
 ‘Probably, students received three balls.’

This fact is again predicted under the current proposal. Given that the object can undergo scrambling to the left of the low adverb within vP, the object and NQ<sub>obj</sub> can be reordered with respect to the low adverb *before* the spell-out of vP.<sup>28</sup> This is illustrated in (35a). Moreover, as illustrated in (35b), the object and the NQ<sub>obj</sub> can also be separated by a high adverb via object scrambling in the CP domain, which adds a new ordering statement specifying that the object precedes the high adverb. (In (35b), the subject additionally scrambles to the left of the high adverb.)

- (35) a.  $\begin{array}{c} \downarrow \\ \downarrow \end{array}$  [vP O<sub>1</sub> [v' S L-Adv t<sub>1</sub> NQ<sub>obj</sub> V v]]: (34a)  
 Ordering in vP: O<S<L-Adv<NQ<sub>obj</sub><V<v
- b.  $\begin{array}{c} \downarrow \downarrow \\ \downarrow \downarrow \end{array}$  [CP O<sub>1</sub> S<sub>2</sub> H-Adv [vP t<sub>1</sub> [v' t<sub>2</sub> t<sub>1</sub> NQ<sub>obj</sub> V v]] T C]: (34b)  
 Ordering in vP: O<S<NQ<sub>obj</sub><V<v  
 Ordering in CP: O<S<H-Adv<NQ<sub>obj</sub><V<v<T<C

<sup>27</sup> A reviewer notes that in German, object shift allows the object to move past the high adverbs listed in (33). In Korean, too, the object may move across these high adverbs via scrambling, stranding an associate NQ.

<sup>28</sup> The grammaticality of (i) provides further support for the claim that a floating NQ is not an adverb. If a floating NQ<sub>subj</sub> were an adverb that does not form a constituent with the subject, we would expect that the object could scramble to the left of the NQ<sub>subj</sub> and yield the order S<O<NQ<sub>subj</sub>, just as in (i), contrary to what we find in (2b). (I thank Danny Fox (pers. comm.) for stressing the importance of the grammaticality of (i).)

(i) Haksayng-tul-i **kong-ul** *ilpwule* **sey-kay** pat-ass-ta.  
 student-PL-NOM ball-ACC deliberately 3-CL receive-PAST-DEC  
 ‘Students received three balls deliberately.’ (cf. (2b) and (3))

To account for the contrast between (i) and (2b) under the claim that a floating NQ is an adverb, one would have to postulate that an NQ<sub>subj</sub> is a special type of adverb that must be adjacent to the subject before the spell-out of vP. At the moment, however, there is no independent reasoning to support such a constraint.

The arguments from the high-low adverb asymmetry provide another immediate prediction: if a certain adverb can be merged either in a high (vP-external) or in a low (vP-internal) position, the floating-quantifier construction will disambiguate the syntactic position of the adverb. Specifically, only the high adverb reading will emerge when an ambiguous adverb intervenes between the subject and the NQ<sub>subj</sub>. This prediction is borne out as well.

As illustrated in (36), subject-oriented adverbs (e.g., *mwulyeyhakey* ‘rudely’, *yenglihakey* ‘cleverly’) are ambiguous between the (high) evaluative reading and the (low) agent-oriented manner reading (see Jackendoff 1977 for the same paradigm in English).

- (36) John-i mwulyeyhakey maykcwu-lul masi-ess-ta.  
 John-NOM rudely beer-ACC drink-PAST-DEC  
 ‘It was rude that John drank beer’ (but he drank in a polite manner). (high reading)  
 ‘John drank beer in a rude manner’ (\*but he drank politely). (low reading)

As expected, the ambiguity in (36) disappears when *mwulyeyhakey* ‘rudely’ intervenes between the subject and the subject-oriented NQ<sub>subj</sub>. As illustrated in (38), the intervening adverb retains only the high adverb reading, in contrast to what we see in (37).<sup>29</sup> The paradigm established here thus implies that the floating-quantifier construction provides a useful diagnostic to test whether a certain adverb is merged inside or outside vP.

- (37) **Haksayng-tul-i yel-myeng** mwulyeyhakey maykcwu-lul masi-ess-ta.  
 student-PL-NOM 10-CL rudely beer-ACC drink-PAST-DEC  
 (?)?‘It was rude that ten students drank beer.’  
 ‘Ten students drank beer in a rude manner.’
- (38) **Haksayng-tul-i mwulyeyhakey yel-myeng** maykcwu-lul masi-ess-ta.  
 student-PL-NOM rudely 10-CL beer-ACC drink-PAST-DEC  
 ‘It was rude that ten students drank beer.’  
 ?\*‘Ten students drank beer in a rude manner.’

In the next section, I provide further evidence for my account from asymmetries between an unaccusative/passive subject and an unergative subject.

### 3 Unaccusative/Passive versus Unergative Subject Asymmetry

So far, I have argued that the subject and NQ<sub>subj</sub> cannot be separated by a vP-internal element, assuming that the subject is externally merged in Spec,vP and thus cannot vP-scramble. This argument predicts that if the subject is not externally merged at Spec,vP, the subject and the

<sup>29</sup> For reasons that are unclear to me, I strongly prefer the manner reading with *mwulyeyhakey* ‘rudely’ for (37). If *mwulyeyhakey* ‘rudely’ scrambles over the subject, as in (i), the manner and evaluative readings are equally possible.

- (i) Mwulyeyhakey **haksayng-tul-i yel-myeng** maykcwu-lul masi-ess-ta.  
 rudely student-PL-NOM 10-CL beer-ACC drink-PAST-DEC  
 ‘It was rude that ten students drank beer.’  
 ‘Ten students drank beer in a rude manner.’

$NQ_{\text{subj}}$  may be separated by a  $vP$ -internal element. In this section, I show that this prediction is corroborated by Miyagawa's (1989) observations.

Miyagawa (1989) observes a contrast between unaccusative/passive and unergative subjects in Japanese: while unaccusative and passive subjects can be separated from their associate  $NQ_{\text{subj}}$  by an adverb phrase or by an agentive *ni* 'by' phrase, the unergative subject cannot (see Miyagawa 1989:38–44 for Japanese examples; cf. Kuno and Takami 2003 for different judgments). As illustrated in (39)–(41), a similar paradigm is also observed in Korean (see also Lee 1989, 1999 for other contrasts between unaccusatives and unergatives in Korean).<sup>30</sup>

- (39) **Koyangi-ka** i pyeng-ulo **sey-mali** cwuk-ess-ta.  
 cat-NOM this disease-by 3-CL<sub>animal</sub> die-PAST-DEC  
 'Three cats died from this disease.' (unaccusative,  $S < PP < NQ_{\text{subj}}$ )
- (40) Ecey, **catongcha-ka** koyhan-eykey **twu-tay** pwuswu-eci-ess-ta.  
 yesterday car-NOM robber-DAT 2-CL<sub>car</sub> break-PASS-PAST-DEC  
 'Yesterday, two cars were broken into by a robber.' (passive,  $S < PP < NQ_{\text{subj}}$ )
- (41) ?\***Haksayng-tul-i** caki-uy ton-ulo **twu-myeng** cenhwaha-yess-ta.  
 student-PL-NOM self-GEN money-by 2-CL telephone-PAST-DEC  
 'Two students telephoned with their own money.' (unergative,  $S < PP < NQ_{\text{subj}}$ )

This asymmetry between unaccusative/passive and unergative subjects is exactly what the present approach to scrambling predicts. Given the well-established hypothesis that the unaccusative/passive subject is *derived* from an internal argument position in VP (e.g., Perlmutter 1978, Belletti and Rizzi 1981, Burzio 1986, Miyagawa 1989), we expect that the derived subject may behave just like the object in terms of linearization.

In particular, if the subject is base-generated within VP and may undergo movement to Spec, $vP$ , it is expected that the subject can indeed revise the word order with respect to the (low) adverb phrase before the spell-out of  $vP$ , as demonstrated in (42).<sup>31</sup> Furthermore, given the

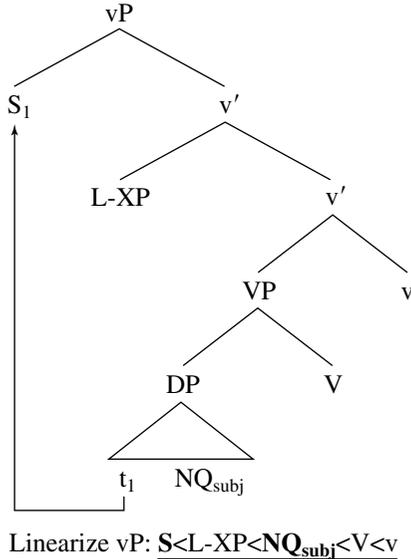
<sup>30</sup> Lee (1989) judges (i) to be slightly better than (ii) and argues that an unaccusative subject allows an associate NQ more readily than a unergative subject. Note, however, that the contrast between (39)–(40) and (41) is much stronger than the claimed subtle contrast between (i) and (ii).

- (i) **Haksayng-i sey-myeng** tochakha-yess-ta.  
 student-NOM 3-CL arrive-PAST-DEC  
 'Three students arrived.'
- (ii) ?**Haksayng-i sey-myeng** wus-ess-ta.  
 student-NOM 3-CL laugh-PAST-DEC  
 'Three students laughed.'

<sup>31</sup> To clarify: the analysis in (42) can be made compatible with the claim that weak phases (unaccusative/passive  $vPs$ ) do not undergo Spell-Out (Chomsky 2001; cf. Legate 2003). In particular, if weak phase  $vPs$  are not Spell-Out domains, the subject may move to the left of a low adjunct, as in (42), and the ordering in the CP domain would constitute the first linearization information concerning the subject and the low adjunct. In Ko 2005a, however, I provide various arguments that VP can be a Spell-Out domain, which suggests that unaccusative/passive  $vP$  must undergo Spell-Out. Thus, I do not pursue Chomsky's weak phase theory here. The analysis in (42) also raises the question whether the movement in (42) is A- or  $\bar{A}$ -movement (David Pesetsky, pers. comm.). Given that a passive subject can A-bind into an

hypothesis that an unergative subject is base-generated in Spec,vP, just like the subject in a transitive vP (e.g., Hale and Keyser 1993, Chomsky 1995), it is also predicted that low adjunct phrases such as *caki-uy ton-ulo* 'self-GEN money-by' in (41) cannot intervene between the unergative subject and the NQ<sub>subj</sub>. This is illustrated in (43).<sup>32</sup>

(42) *Unaccusative/passive subject*



NP in an agentive *by*-phrase, I assume that this movement can be A-movement. Further research is needed, however, to see whether the binding in (i) is due to later scrambling of the passive subject to Spec,TP rather than due to scrambling to Spec,vP.

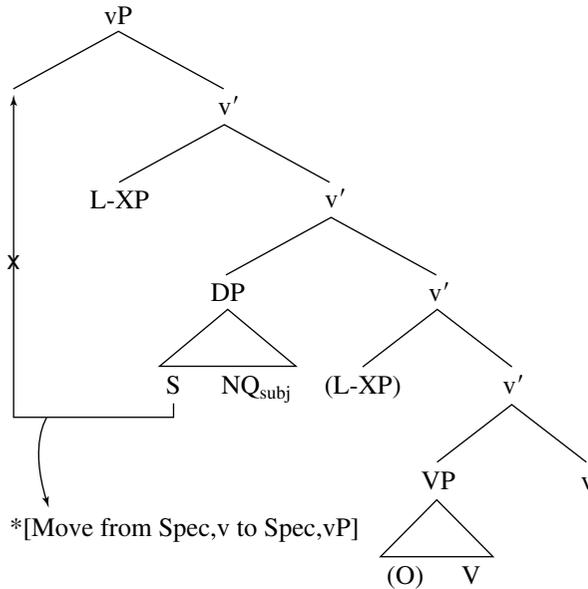
- (i) ?**Haksayang-tul-i**<sub>1</sub> caki-uy<sub>1</sub> sensayng-nim-eykey **twu-myeng** pwuthcap-hi-ess-ta.  
 student-PL-NOM self-GEN teacher-HON-by 2-CL capture-PASS-PAST-DEC  
 'Two students were captured by their own teacher.'

- (ii) ?\*Caki-uy<sub>1</sub> sensayng-nim-eykey haksayang-tul-i<sub>1</sub> twu-myeng pwuthcap-hi-ess-ta.

<sup>32</sup> Some accusative-Case-marked locative PPs may intervene between a subject and an NQ.

- (i) Ecey, **kwunsa-tul-i** *ku tali-lul* **twu-myeng** kennu-ess-ta.  
 yesterday soldier-PL-NOM that bridge-ACC 2-CL CROSS-PAST-DEC  
 'Yesterday, two soldiers crossed that bridge.'

Following Miyagawa (see 1989:47 for the same paradigm in Japanese), I assume that the subject 'soldiers' in (i) originated from the VP as an internal argument of 'cross'. Independent evidence would be required to solidify this claim, however.

(43) *Unergative subject*

Linearize vP: L-XP < S < NQ<sub>subj</sub> < (L-XP) < V < v

Another prediction that follows from my analysis is that the asymmetry between unaccusative/passive and unergative subjects seen in (41)–(43) will disappear if we test a paradigm with a high adverb. More specifically, a high adverb is introduced *after* the spell-out of vP. Thus, it does not matter for the purpose of linearization of the subject and a high adverb whether the subject is base-generated in VP or in Spec,vP. In both cases, the subject is able to undergo scrambling over the high adverb and add a new ordering statement (e.g., S < H-Adv) in the higher domain. This prediction is also borne out, as shown by the grammaticality of (44).<sup>33</sup>

- (44) a. **Haksayng-tul-i amato sey-myeng** tochakha-yess-ulkes-ita.  
 student-PL-NOM probably 3-CL arrive-PAST-likely-be  
 ‘Probably, three students arrived.’

<sup>33</sup> Nakanishi (2003a,b) claims that Japanese NQs cannot be separated from the host NP when the predicate denotes a (singular) telic event (e.g., ‘destroy John’s house’). This argument provides an interesting perspective on why judgments for floating NQs are affected by the choice of predicate. This, however, cannot be an alternative account for the asymmetries in scrambling observed here (and in corresponding Japanese paradigms). In particular, it is not obvious how Nakanishi’s proposal would account for constraints on multiple scrambling, the asymmetries between high and low adverbs in subject scrambling, lack of asymmetries between high and low adverbs in object scrambling, and the contrasts between unaccusative/passive and unergative subjects. In Ko 2005a, I also present other paradigms that are not straightforwardly accommodated under the semantic approach taken by Nakanishi. See, in particular, arguments concerning control paradigms, restrictions on object scrambling, and two types of floating quantifiers in Korean and Japanese presented in Ko 2005a. (I thank a reviewer for drawing my attention to Nakanishi’s work.)

- b. **Haksayng-tul-i amato sey-myeng** cenhwahay-ss-ulkes-ita.  
 student-PL-NOM probably 3-CL telephone-PAST-likely-be  
 ‘Probably, three students telephoned.’

#### 4 Stranded Possessee: The Asymmetries Again

In the preceding sections, I have presented arguments for the Cyclic Linearization approach to scrambling, using various paradigms of floating numeral quantifiers. In this section, I provide further evidence for my arguments using possessor-raising constructions, which simultaneously resolves a controversy about underlying constituency in Korean.

Korean allows multiple nominative and accusative Case marking in the domain of a single predicate. The inalienable possession construction (IPC) is a context where such multiple Case marking is observed.<sup>34</sup> The examples in (45) illustrate multiple nominative and accusative marking in the IPC.

- (45) a. **John-i apeci-ka** pwuca-ta.  
 John-NOM father-NOM rich-DEC  
 ‘John’s father is rich.’  
 b. Mary-ka **John-ul tali-lul** cap-ass-ta.  
 Mary-NOM John-ACC leg-ACC grab-PAST-DEC  
 ‘Mary grabbed John’s leg.’

The syntactic and semantic properties of the IPC have been extensively discussed in the literature.<sup>35</sup> While the details of the proposals may differ, analyses of the IPC can be divided into two families, differing on their view of the relationship between the possessor and the possessee in underlying structure.

One camp, advocating the *constituent approach*, argues that the possessor is a direct argument of the possessee and is extracted from a DP containing the possessee for Case reasons, as described in (46) (see, e.g., Choe 1987, Ura 1996, and Cho 2000, for Korean).<sup>36</sup>

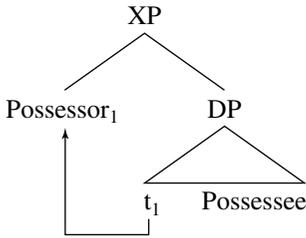
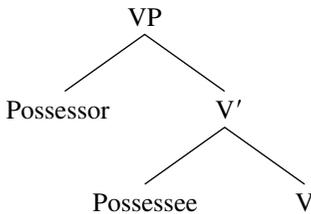
The other camp, advocating the *nonconstituent approach*, argues that the possessor is an argument of the verbal predicate and thus does not form a constituent with the possessee in underlying structure, as illustrated in (47) (see, e.g., Kim 1989, 1990, Yoon 1990, Sim 2004, and Tomioka and Sim 2005, for Korean).<sup>37</sup>

<sup>34</sup> I assume that inalienable possession is a relation that is inborn, inherent, or not conferred by purchase, such as body part, kinship, and part-whole (adopting proposals in Choe 1987, Yoon 1990, and Ura 1996, among many other works).

<sup>35</sup> See Chun 1985, Choe 1987, Kang 1987, Kim 1989, 1990, Yoon 1990, Maling and Kim 1992, Kitahara 1993, D.-I. Cho 1993, Ura 1996, S. Cho 2000, and Sim 2004, among many other works, for discussion of IPCs in Korean.

<sup>36</sup> See Szabolcsi 1983, Keach and Rochemont 1992, Landau 1999, and references therein for the constituent approach for other languages. See in particular Landau 1999 for an overview of the constituent and nonconstituent approaches.

<sup>37</sup> As a reviewer points out, it is not obvious how the possessor can be an argument of the verb in (47). This in fact has been a recurrent issue for the nonconstituent approach. Yoon (1990), for instance, argues that the possessee and the verb form a ‘‘complex predicate’’ (via  $\theta$ -identification), adopting Higginbotham’s (1985) proposal. Tomioka and Sim (2005) argue that there is in fact a silent verb between the possessor and the possessee and that the silent verb takes the

(46) *Constituent approach*(47) *Nonconstituent approach*

This controversy is particularly interesting in the context of the current analyses of scrambling. Specifically, if the possessor and the possessee form a constituent, as in (46), we predict that the (stranded) possessee will show the effects of Cyclic Linearization, replicating the paradigms of NQ constructions seen in the preceding sections.<sup>38</sup> If the possessor and the possessee do not form a constituent, as in (47), we predict that the (stranded) possessee will behave like other adjuncts merged within vP (a low adverb in (34a), for example). The data consistently show that the former prediction is correct (but see footnote 42 for some important qualification of this statement).

First, just as in the paradigms with floating-NQ constructions in (1)–(2), the object cannot intervene between a nominative-marked possessor (*S-possessor*) and a nominative-marked possessee (*S-possessee*), whereas the subject can intervene between an accusative-marked possessor (*O-possessor*) and an accusative-marked possessee (*O-possessee*). This is illustrated in (48).<sup>39</sup>

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possessor as its argument. It is worth noting, however, that these studies arguing for the nonconstituent approach discuss only multiple accusative IPCs (Yoon 1990, Sim 2004, Tomioka and Sim 2005). It is not obvious to me how the semantic mechanisms developed there would extend to multiple nominative IPCs such as (45a).

<sup>38</sup> This prediction was pointed out to me by Norvin Richards, and the theoretical implication of the prediction for the nature of possessor raising was pointed out to me by David Pesetsky. I thank them for these key comments.

<sup>39</sup> I employed a kinship IPC for (48a) and a body part IPC for (48b). This, however, is not the reason why (48a) and (48b) differ in their grammatical status. As shown in (ia), the order S-possessor < O < S-possessee < V remains ungrammatical when the sentence involves a body part IPC. (For reasons that are unclear to me, however, a nominative-marked possessor is not allowed at all in the body part IPC, as shown in (ib).)

- (i) a. \***John-i** kong-ul **tali-ka** cha-ss-ta.  
 John-NOM ball-ACC leg-NOM kick-PAST-DEC  
 'John's leg kicked the ball.' (cf. (48b))  
 b. \***John-i tali-ka** kong-ul cha-ss-ta.  
 (ii) ?**John-i apeci-ka** kong-ul cha-ss-ta. (cf. (ib))

- (48) a. \***John-i** kong-ul **apeci-ka** cha-ss-ta.  
 John-NOM ball-ACC father-NOM kick-PAST-DEC  
 ‘John’s father kicked a ball.’ (cf. (2b))
- b. **John-ul** Mary-ka **tali-lul** cha-ss-ta.  
 John-ACC Mary-NOM leg-ACC kick-PAST-DEC  
 ‘Mary kicked John’s leg.’ (cf. (1b))

Second, just as in the paradigms with floating NQs in (30)–(32), vP-internal elements (e.g., indirect object, a low adverb) may not intervene between the S-possessor and the S-possessee. This is demonstrated in (49)–(50). In contrast, vP-external elements (e.g., a high adverb) may intervene between the S-possessor and the S-possessee, as shown in (51).

- (49) \***John-i** Mary-eykey **apeci-ka** kong-ul cwu-si-ess-ta.  
 John-NOM Mary-DAT father-NOM ball-ACC give-HON-PAST-DEC  
 ‘John’s father gave a ball to Mary.’ (cf. (30b))
- (50) [A possible preceding context: ‘Whose father collects stamps?’]<sup>40</sup>
- a. \***John-i** *yelsimhi* **apeci-ka** wupyo-lul mou-si-n-ta.<sup>41</sup>  
 John-NOM diligently father-NOM stamp-ACC collect-HON-PRES-DEC  
 ‘John’s father collects stamps diligently.’ (cf. (32a), (33a))
- b. ?**John-i** **apeci-ka** *yelsimhi* wupyo-lul mou-si-n-ta.  
 John-NOM father-NOM diligently stamp-ACC collect-HON-PRES-DEC  
 ‘John’s father collects stamps diligently.’
- (51) a. [A possible preceding context: ‘Whose father collects stamps?’]  
 ?**John-i** *pwunmyenghi* **apeci-ka** wupyo-lul mou-si-n-ta.  
 John-NOM evidently father-NOM stamp-ACC collect-HON-PRES-DEC  
 ‘Evidently, John’s father collects stamps.’ (cf. (32b), (33b))
- b. [A possible preceding context: ‘Whose father retired last year?’]  
 ?**John-i** *caknyen-ey* **apeci-ka** thoycik-ul ha-si-ess-ta.  
 John-NOM last.year-in father-NOM retire-ACC do-HON-PAST-DEC  
 ‘John’s father retired last year.’

Third, just as in the paradigms with a floating NQ in (34)–(35), the high-low adverb asymmetry in (50)–(51) disappears if an O-possessee is employed.

<sup>40</sup> Contexts are given in (50) and (51) to make it felicitous to use multiple nominative IPCs. See Yoon 2004 for various syntactic and pragmatic factors for using multiple nominative IPCs in Korean. See also Ko 2005a for more examples employing stative, habitual, and episodic predicates in IPCs and for subtle judgment variations among them.

<sup>41</sup> Hajime Hoji (pers. comm.) reports that the contrast between high and low adjuncts in (50)–(51) is rather weak in Japanese though the subject-object asymmetry in (48a–b) is quite robust. As Hoji points out, if the subject in (50)–(51) may be interpreted as a base-generated topic or major subject, the putative lack of contrast between high and low adjuncts may be accounted for. However, the robust contrast between subject and object scrambling in IPCs would remain unexplained. I leave this for future research.

- (52) **John-ul** Mary-ka *ilpwule/pwunmyenghi* **tali-lul** cap-ass-ta.  
 John-ACC Mary-NOM deliberately/evidently leg-ACC grab-PAST-DEC  
 ‘(Evidently) Mary grabbed John’s leg (deliberately).’ (cf. (34))

Fourth, as in the paradigms with an NQ in (39)–(41), the unaccusative/passive subject behaves like the object in that a derived S-possessor and its possessee can be separated by a vP-internal element, in contrast to what is possible in unergative subject paradigms.

- (53) **John-i** ku pyeng-ulo **aki-ka** cwuk-ess-ta.  
 John-NOM that disease-by baby-NOM die-PAST-DEC  
 ‘John’s baby died from that disease.’ (cf. (39))
- (54) **John-i** Mary-eykey **sonmok-i** cap-hi-ess-ta.  
 John-NOM Mary-DAT wrist-NOM grab-PASS-PAST-DEC  
 ‘John’s wrist was grabbed by Mary.’ (cf. (40))
- (55) [A possible context: ‘Whose father called deliberately (during the lecture)?’]  
 a. \***John-i** *ilpwule* **apeci-ka** cenhwaha-si-ess-ta.  
 John-NOM deliberately father-NOM telephone-HON-PAST-DEC  
 ‘John’s father telephoned deliberately.’ (cf. (41))  
 b. ?**John-i** **apeci-ka** *ilpwule* cenhwaha-si-ess-ta.  
 John-NOM father-NOM deliberately telephone-HON-PAST-DEC  
 ‘John’s father telephoned deliberately.’ (cf. (41))

Given the parallelism between IPCs and floating-NQ constructions described above, I argue that my accounts for floating-NQ constructions in sections 2–3 directly extend to the corresponding paradigms in IPCs, (48)–(55).

It has often been reported that the possessor and the possessee can be separated by high adverbs, such as a temporal adverb (*ecey* ‘yesterday’) (Cho 1993). To the best of my knowledge, however, it has not been clear how low adverbs interact with the IPC and why low adverbs behave differently from high adverbs in the IPC. Moreover, the fact that the distribution of the stranded possessee parallels that of the floating NQ has not been captured before. In this section, we have seen that once we assume the constituent approach to the IPC, the Cyclic Linearization approach to scrambling predicts such parallelism between the stranded NQ and the possessee and thus provides a unified account for it.<sup>42</sup>

<sup>42</sup> Importantly, however, the conclusion drawn here should be limited to multiple nominative IPCs. The distribution of multiple accusative IPCs seen here is compatible with both the constituent and nonconstituent approaches. Specifically, the O-possessor may move to the left of the subject (48b) or a low adverb (52) within vP, whether or not the O-possessor and the O-possessee form a constituent in underlying structure. In Ko 2005a:chap. 4, I provide other diagnostics to test underlying structure and show that the nonconstituent approach can in fact be supported for multiple accusative IPCs.

In the next section, I discuss some apparent counterexamples to my proposal and show that they do not pose a problem for my arguments; instead, they shed light on the underlying structure of different types of floating quantifiers in Korean.

## 5 Asymmetries among Floating Quantifiers

Unlike the NQs discussed so far, certain types of subject-oriented floating quantifiers may be separated from the associate subject by the object, as shown in (56). These types of floating quantifiers (FQs) include Case-marked NQs, focus-marked NQs, and quantifier phrases (QPs) such as the universal quantifier *motwu* ‘all’ and the negative polarity item (NPI) *amwuto* ‘anyone’ (see, e.g., O’Grady 1991, Kwak 1995, and Kang 2002, for Korean; and see Ishii 1998 for Japanese).<sup>43</sup>

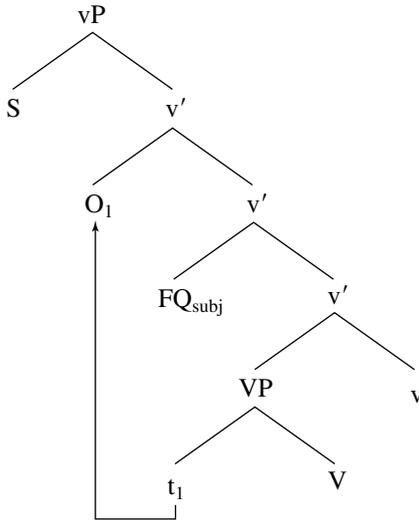
- (56)  $S < O < FQ_{subj} < V$
- a. **Haksayng-tul-i** khempywuthe-lul **twu-myeng-i/ina/man** sa-ss-ta.  
 student-PL-NOM computer-ACC 2-CL-NOM/DELIMITER/only buy-PAST-DEC  
 ‘Two/Even two/Only two students bought computers.’
  - b. **Haksayng-tul-i** sakwa-lul **motwu(-ka)** mek-ess-ta.  
 student-PL-NOM apple-ACC all(-NOM) eat-PAST-DEC  
 ‘All the students ate apples.’
  - c. **Haksayng-tul-i** sakwa-lul **amwuto(\*-ka)** mek-ci-anh-ass-ta.  
 student-PL-NOM apple-ACC anyone(-NOM) eat-CI-NEG-PAST-DEC  
 ‘No student ate apples.’

All things being equal, the paradigms in (56) would be counterexamples to my analysis. I argue, however, that this is not the case. Recall that one of the reasons why the object cannot intervene between the subject and the (Caseless)  $NQ_{subj}$  is that the subject and the  $NQ_{subj}$  form a constituent in the underlying structure. If they did not form a constituent, the object could move to a position between the subject and the floating NQ before the spell-out of vP, as illustrated in (57). I argue that (57) is indeed the underlying structure for FQs in (56) (cf. (58)).<sup>44</sup>

<sup>43</sup> The generalization in (56) extends to Japanese, with one exception: Japanese lacks the paradigm in which a Case-marked NQ is preceded by a Case-marked NP (cf. (56a)).

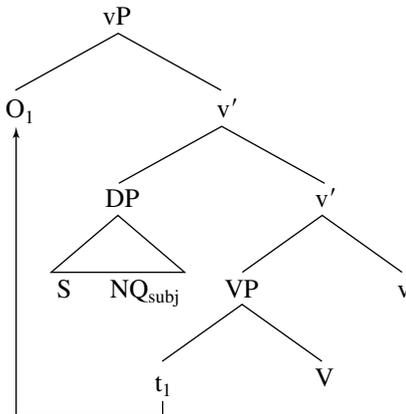
<sup>44</sup> Similar views have been suggested in the previous literature. In particular, my arguments were inspired by work by O’Grady (1991) and Kang (2002), who argue that some FQs in Korean are adverbials modifying a verbal predicate. Ishii (1998) has also argued that it is necessary to assume two types of FQs in Japanese: VP-modifier and NP-modifier. Departing from the previous studies, however, I leave the grammatical category of the FQs in (56) open.

(57) *Floating QP in (56)*



Linearize vP:  $\underline{S < O < FQ_{subj}} < V < v$

(58) *Caseless NQ in sections 1–4*



Linearize vP:  $\underline{O < S < NQ_{subj}} < V < v$

This account makes an immediate prediction: *all other asymmetries observed with Caseless floating NQs will disappear if we employ the floating QPs in (56)*. In particular, we expect that the high-low adverb asymmetry seen in section 2.3 will disappear because a low adverb can be base-generated between S and FQ<sub>subj</sub> or move to Spec,vP to the left of FQ<sub>subj</sub> before the subject merges (just like the object in (57)). This prediction is correct, as exemplified in (59).

- (59) *Subject* < *Low adverb* <  $FQ_{subj}$  (cf. (32)–(33))
- Haksayng-tul-i** *yelsimhi* **twu-myeng-i** kong-ul cha-ss-ta.  
student-PL-NOM diligently 2-CL-NOM ball-ACC kick-PAST-DEC  
'Two students kicked a ball diligently.'
  - Haksayng-tul-i** *yelsimhi* **motwu(-ka)/ta(-tul)** kong-ul cha-ss-ta.  
student-PL-NOM diligently all(-NOM)/all(-PL) ball-ACC kick-PAST-DEC  
'All the students kicked a ball diligently.'
  - Haksayng-tul-i** *yelsimhi* **amwuto** kong-ul cha-ci-anh-ass-ta.  
student-PL-NOM diligently anyone ball-ACC kick-CI-NEG-PAST-DEC  
'No students kicked a ball diligently.'

In the same vein, we predict that the unaccusative-unergative asymmetry will disappear when we employ the FQs in (56). In particular, if a vP-internal element can be externally merged in (or move to) a position between the unergative subject and the  $FQ_{subj}$ , we expect that the vP-internal element may intervene between the subject and the  $FQ_{subj}$  whether the subject is associated with an unaccusative verb or an unergative verb. This prediction is correct, as shown in (60).

- (60) *Subject* < *Low adjunct PP* <  $FQ_{subj}$  < *unergative V* (cf. (41))
- Haksayng-tul-i** ku khatu-lo **sey-myeng-i** cenhwaha-yess-ta.  
student-PL-NOM that card-with 3-CL-NOM telephone-PAST-DEC  
'Three students telephoned with that card.'
  - Haksayng-tul-i** ku khatu-lo **motwu(-ka)/ta(-tul)** cenhwaha-yess-ta.  
student-PL-NOM that card-with all(-NOM)/all(-PL) telephone-PAST-DEC  
'All students telephoned with that card.'
  - Haksayng-tul-i** ku khatu-lo **amwuto** cenhwaha-ci-anh-ass-ta.  
student-PL-NOM that card-with anyone telephone-CI-NEG-PAST-DEC  
'No students telephoned with that card.'

The paradigms in (56)–(60) thus sustain the claim that the floating QPs in (56) do not form a constituent with their host NP and that there are in fact two types of FQs in Korean.<sup>45</sup> As a reviewer notes, however, further research is required to determine whether my conclusion about the underlying structure of FQs in (56) can be independently supported (see Ko 2005a for preliminary evidence for the current conclusion from Case concord and mismatch phenomena in FQ constructions).

This conclusion also has an implication for the effect of focus on Caseless NQ constructions noted earlier (footnote 2). When focus is imposed on numerals, the asymmetries observed with

<sup>45</sup> One remaining issue, though not crucial here, is why there exist two types of floating QPs in Korean and what the exact characteristics of the QPs in (56) are (adverbial (Fukushima 1991), secondary predicate (Miyagawa 1989), or some other sort if any). See Kang 2002 for related discussion. A possible alternative approach for (56)–(60) that dispenses with these questions is to assume that a focus particle or Case marker attached to the QPs in (56) introduces a new head (above vP) and extends the Spell-Out domain, so that the subject may move to the left of the object before the spell-out of the first domain that includes S, O, and  $FQ_{subj}$ . Further research is required to determine whether there is independent evidence for positing such an extra head introduced by focus/Case particles within vP.

Caseless NQ constructions tend to be weakened for some speakers (see Kang 2002 for judgment variations). I suggest that this is because the focus on numerals allows speakers to analyze a Caseless NQ as a focused NQ (such as *twu-myeng-man* ‘2-CL-only’ in (56)). In other words, because of the focus imposed on the NQ, the Caseless NQ can be analyzed as the type of QP in (56) with a covert focus particle.<sup>46</sup> I leave substantiation of this suggestion for further research.

## 6 Concluding Remarks

In this article, we have observed a variety of asymmetries in scrambling. The subject may intervene between the object and its NQ, but the object may not intervene between the subject and its NQ (section 1). The indirect object, PP-argument, and vP-internal adjuncts may not intervene between the subject and its NQ, but vP-external adverbs may (section 2). Unaccusative and passive subjects can be separated from their NQ by vP-internal elements, but unergative subjects cannot (section 3). Possessor-raising constructions show the same types of asymmetries observed with floating-NQ constructions (section 4). Case-marked NQs, focus-marked NQs, and certain quantifiers lack all the asymmetries observed with Caseless NQs (section 5).

Throughout the article, I have argued that all these asymmetries can receive a principled account if scrambling is constrained by Cyclic Linearization. In particular, I have provided evidence for the claim that possible linear orderings must be determined in the smallest Spell-Out domain in which elements are introduced. If successful, my arguments support the idea that the architecture of grammar requires linearization in phonology to be cyclically determined by the syntax. My arguments also shed light on the formal properties of scrambling—in particular, showing that scrambling is conditioned by a legitimate probe-goal configuration, so that no scrambling is allowed from one specifier to another specifier of the same head. My arguments thus provide further support for the line of approach arguing that scrambling must obey locality conditions on feature movement.

Some remarks on the notion of Spell-Out domains are in order, however. In this article, I have simply assumed that vP and CP are Spell-Out domains for Korean, but I have remained agnostic about what determines Spell-Out domains in languages in general (see section 1.2.2 and footnotes 14 and 15 for relevant discussion). To strengthen the current claims for Cyclic Linearization, further research is required to understand the nature of Spell-Out domains. In particular, it remains to be seen whether maximal categories other than vP and CP may constitute Spell-Out domains in languages in general. If so, which projection may constitute a Spell-Out domain, and what factors would determine the Spell-Out domain, must be investigated. If there are parametric variations in the determination of Spell-Out domains in languages, how children acquire one variant or another would also be an important research question. I hope that this article will provide a useful background for probing these issues in future research.

<sup>46</sup> David Pesetsky (pers. comm.) suggests that the fact that the Case marker in Korean can be dropped would also be a factor. If the Case marker can be optionally dropped from an NQ, an NQ in an NP-NQ sequence is always ambiguous between a true Caseless NQ, as in (58), and a covertly Case-marked NQ, as in (57). This line of approach, however, needs to explain why the asymmetries with Caseless NQs disappear only when focus is imposed on the NQ. I leave this issue open.

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