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Asymmetries in Scrambling and Cyclic Linearization*

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

paper 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 paper concerning linearization in scrambling. I argue that constructions with scrambling are cyclically linearized at the PF-syntax interface via Spell-out, as Fox and Pesetsky (2003, 2005a,b) extensively argued on the basis of other types of movements 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 (CL). An NQ can be separated from its host NP in various contexts.[1] 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_{obj}). By contrast, the object cannot intervene between the subject and the subject-oriented NQ (NQ_{subj}), as described in (2) (Park and Sohn 1993, Lee 1993, Kang 2002, among others; see also Haig 1980, Kuroda 1983, Saito 1985, Miyagawa 1989, Fujita 1994, among others, for the same paradigm in Japanese).[2]

(1) a. John-i **maykcwu-lul** **sey-pyeng** masi-ess-ta[3]

J-NOM beer-ACC 3-CL_{bottle} drink-PAST-DEC

'John drank three bottles of beer'

b. **Maykcwu-lul** John-i **sey-pyeng** masi-ess-ta

Beer-ACC J-NOM 3-CL_{bottle} 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_{person} beer-ACC drink-PAST-DEC

'Three students drank beer.'

b. ***Haksayng-tul-i** maykcwu-lul **sey-myeng** masi-ess-ta

Student-Pl-NOM beer-ACC 3-CL_{person} 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 (Kuroda 1983, Sportiche 1988, among others).

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).[4] Given this

subject-object asymmetry, Saito argues that the subject cannot scramble at all (cf. Hoji 1985)[5] and thus cannot move to the left of the object in (2b).[6]

(3) *[S_2 O_1 t_2 NQ_{subj} t_1 V]

Contrary to the claim for a general ban on subject scrambling, however, there is some evidence that the subject can indeed scramble (Kurata 1991, Lee 1993, Sohn 1995, Ko 2005b, among others). In particular, an embedded subject may scramble over a matrix subject (with some parsing difficulty), as illustrated in (4) (Lee 1993; Sohn 1995).[7] 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.

(4) John-i_1 [$_{CP}$ na-nun [$_{CP}$ t_1 Mary-lul mannassta-ko] sayngkakhanta]]
J-NOM I-TOP M-ACC met-C think
'John$_1$, I think that t_1 met Mary.' (adapted from Sohn 1995)

(5) **Haksayng-tul**-i_1 [na-nun [t_1 **sey-myeng** Mary-lul mannassta-ko] sayngkakhanta]]
Student-Pl-NOM I-TOP 3-CL M-ACC met-C think
'Students$_1$, 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 NQ_{subj} by *v*P-external adverbs such as *pwunmyenghi* 'evidently' (6) and *way* 'why' (7).[8] (For convenience, I call *v*P-external adverbs high adverbs, and *v*P-internal adverbs low adverbs. See section 2.3 for the distribution of low adverbs with respect to NQ_{subj}.) If the subject cannot scramble at all, we would expect (6) and (7) to be ungrammatical, contrary to the facts.

(6) **Haksayng-tul-i**$_1$ *pwunmyenghi* t_1 **sey-myeng** maykcwu-lul masiessta
Student-Pl-NOM evidently 3-CL_{people} beer-ACC drank
'Evidently, three students drank beer.'

(7) **Haksayng-tul-i**$_1$ *way* t_1 **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).[9] The paradigms in (8)-(9) further confirm Saito's insight that subject scrambling is impossible in certain contexts where the

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

(8) ?*[S_2 O_1 *adv* t_2 NQ_{subj} t_1 V]

?***Haksayng-tul-i**$_2$ maykcwu-lul$_1$ *pwunmyenghi* t_2 **sey-myeng** t_1 masiessta

Student-Pl-NOM beer-ACC evidently 3-CL_{person} drank

'Evidently, three students drank beer.'

(9) [O_1 S_2 *adv* t_2 t_1 NQ_{obj} V]

Maykcwu-lul$_1$ **haksayng-tul-i**$_2$ *pwunmyenghi* t_2 t_1 **sey-pyeng** masiessta

Beer-ACC student-Pl-NOM evidently 3-CL_{bottle} drank

'Evidently, students drank three bottles of beer.'

The floating NQ paradigms thus provide us with 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 as the object strands its NQ across the subject [(1),(9)]. In the next section, I present a solution to this puzzle.

1.2 Proposal

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 follows from the conspiracy of three factors: (i) information concerning linear orderings of syntactic units is sent to PF at each Spell-out via *Cyclic Linearization* (ii) the subject is a Spec of a Spell-out domain head *v*, (iii) NP and NQ form a constituent at the base-position.

1.2.1 Scrambling and 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, 2005a; F&P, hereafter) as a consequence of cyclic Spell-out.

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

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 corresponds to Chomsky's *phase*.[10] Spell-out applies to Spell-out Domains cyclically. In particular, the cyclic Spell-out operation establishes relative orderings among elements contained in a Spell-out Domain via *Cyclic Linearization*. The outcome 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 α precedes the first element of β, to the exclusion of traces.[11]

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 can not be erased at PF, it follows that ordering information in an earlier domain must be consistent with new ordering information added in the 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.

Consider, for example, the derivation in (11), under Cyclic Linearization.

(11) a. $[_{vP}$ X Y]: **X<Y**

b. $[_{CP}$ X_1 Z $[_{vP}$ t_1 Y]]: X< Z<*v*P => **X<Z<Y**

In (11a), X precedes Y in the *v*P domain. Once *v*P 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 *v*P is remerged in CP (i.e. movement of X in CP). After the Spell-out of CP, the new orderings (X<Z<*v*P) are added in PF. Since the first (overt) element in *v*P is Y, PF obtains new linearization information, X<Z<Y.[12] Given that the ordering in CP (X<Z<Y) is *consistent* with the one in *v*P (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 *v*P, as in (12a), and that Z is merged in the higher domain CP, and 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<*v*P. Since X is the first element in *v*P, Z precedes X. Given that Y precedes Z and Z precedes X, Y must precede X at CP.

(12) a. $[_{vP}$ X Y]: **X<Y**

b. *$[_{CP}$ Y_1 Z $[_{vP}$ X $t_1]]$: Y<Z<*v*P => **Y<Z<X**

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

To derive the ordering Y<X from (12a), Y must move to the left of X *before* the Spell-out of *v*P, as illustrated in (13a).[13] 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 [X t_1]]: **Y<X**

b. $[_{CP}Y_1$ Z $[_{vP}$ t_1 [X t_1]]: Y<Z<*v*P => **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 the object in VP continue to precede the object after Object Shift (cf. 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 (due to 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 (due to the unavailibility of V to C movement in (14b), where the auxiliary *har* 'have' blocks such movement).[14]

(14) a. Jag $kysste_1$ $henne_2$ inte $[_{VP}$ t_1 $t_2]$

I kissed her not

'I did not kiss her'

b. *Jag har henne$_2$ inte [$_{VP}$ kysst t$_2$]

I have her not kissed

'I have not kissed her'

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 like Object Shift. 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 at the previous domains to avoid an ordering contradiction at PF.

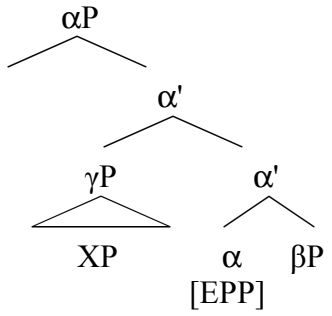
In developing a theory of scrambling under the Cyclic Linearization framework, I adopt the following assumptions. I assume that *v*P and CP constitute Spell-out domains in Korean (but see also Ko (2005a) for further discussion).[15] I take scrambling to be a feature-driven movement (see Miyagawa 1997, 2001, Grewendorf and Sabel 1999, Sabel 2001, and Kitahara 2002, among others, for similar approaches). In particular, I argue that scrambling is an operation that moves a maximal projection to the Spec 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 Specs 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.[16]

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 the probe with an EPP feature c-commands the goal XP*.

Importantly, this claim implies that no scrambling is allowed from one specifier of a head α to another specifier of α (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 α is not in the search domain of the head α. Consequently, no movement can be triggered from a specifier of the head α to another specifier of α, 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.[17] In section 5, I discuss the implications of this claim for Cyclic Linearization. For the current purposes, it suffices to say that this assumption will play a role in blocking some illicit movement of an object (see fn.21, fn.28).

1.3 Analysis

Under the theory of scrambling proposed above, this section analyzes the paradigms of object scrambling, subject scrambling, and multiple scrambling, and resolves the subject-object asymmetry puzzle presented in the previous section.[18]

1.3.1 Object Scrambling

Consider first the basic paradigm of object scrambling in (1) (repeated here as (16)).

(16) [O_1 S t_1 NQ_{obj} V]

Maykcwu-lul$_1$	John-i	t_1	**sey-pyeng**	masi-ess-ta
Beer-ACC	J-NOM		three-CL_{bottle}	drink-PAST-DEC

'John drank three bottles of beer'

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

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

Linearize *v*P: $\underline{O<S<NQ_{obj}<V<v}$

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

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

Linearize CP: $\underline{O<vP<T<C}$ => Ordering at CP: $\underline{O<S<NQ_{obj}<V<v<T<C}$

For clarification, if the object does not undergo scrambling in the *v*P-domain, the ordering in the *v*P-domain (S<O) would contradict the ordering at 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 in 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), repeated here as (19).

(19) [S_1 *adv* t_1 NQ_{subj} O V]

Haksayng-tul-i$_1$ *pwunmyenghi* t_1 **sey-myeng** maykcwu-lul masiessta

Student-Pl-NOM evidently 3-CL_{people} beer-ACC drank

'Evidently, three students drank beer.'

Under Cyclic Linearization, (19) is derived as follows. When the *v*P structure of (19) is projected and spelled out, the ordering statements for the *v*P 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 *v*P, high adverbs do not participate in the linearization of *v*P (cf. section 2.3 for low adverbs merged within *v*P). After a high adverb is merged, the subject moves to the left of the adverb and the CP is spelled-out. After the Spell-out of CP, the ordering statements in CP are established (S<adv <*v*P<T<C), as given in (20b).

(20) a. [$_{vP}$ S NQ_{subj} O V *v*]

Linearize *v*P: <u>S<NQ_{subj}<O<V<*v*</u>

b. [$_{CP}$ S_1 *adv* [$_{TP}$ t_1 [$_{vP}$ t_1 NQ_{subj} O V *v*] T]C]

Linearize CP: <u>S< adv <*v*P <T<C</u>

=> Ordering at CP: <u>S< adv<NQ_{subj}<O<V<*v*<T<C</u>

The linearization at CP adds new ordering statements (e.g. S<adv<NQ_{subj}), but crucially there is no contradiction between the ordering in *v*P 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 matrix subject intervenes between the embedded subject and its NQ, as described in (21).

(21) a. $[_{vP}\ S_e\ \ NQ_{subj}\ \ O\ \ V_e\ \ v_e]$

Ordering at the embedded *v*P: $\underline{S_e<NQ_{subj}<O<V_e<v_e}$

b. $[_{CP}\ [_{TP}\ S_{e1}\ \ [_{vP}\ t_1\ \ NQ_{subj}\ \ O\ \ V_e\ \ v_e]\ T_e]\ C_e]$ [20]

Ordering at the embedded CP: $\underline{S_e<NQ_{subj}<O<V_e<v_e<T_e<C_e}$

c. $[_{vP}\ S_{e1}\ [_{v'}\ S_m\ \ [_{CP}\ \ [_{TP}\ \ t_1\ [_{vP}\ t_1\ \ NQ_{subj}\ O\ \ V_e\ v_e]\ T_e]\ C_e]\ V_m\ v_m\ ]]$

Ordering at the matrix *v*P: $\underline{S_e<S_m<NQ_{subj}<O<V_e<v_e<T_e<C_e<V_m<v_m}$

d. $[_{CP}\ [_{TP}\ S_e\ [_{vP}\ \ t_{e1}\ [_{v'}\ S_m\ [_{CP}\ [_{TP}\ t_1\ [_{vP}\ t_1\ NQ_{subj} O\ V_e\ v_e]\ T_e]\ C_e]\ V_m\ v_m\ ]]T_m]C_m]$

Ordering at 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

Recall now 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 the following, I show that a solution for this puzzle follows from Cyclic Linearization and a 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)

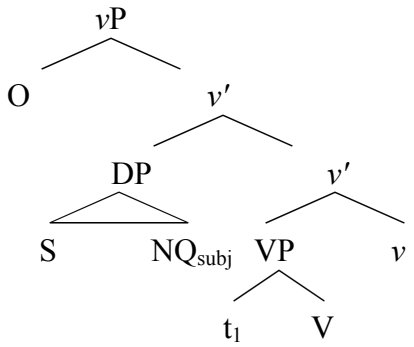
When the argument structure of (22) is projected, the underlying order in (23) is obtained. Given that scrambling may occur optionally in *v*P, we need to consider two logical possibilities: (i) *Case-I* in which the object scrambles in *v*P, (ii) *Case-II* in which the object does not scramble in *v*P. Crucially, given that the subject is externally merged in [Spec,*v*P], the subject cannot scramble within *v*P (recall (15)). Let us start the discussion with Case-I, demonstrated in (24).

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

[$_{vP}$ S NQ_{subj} O V *v*]

(24) *Case-I: the object does scramble in vP*

a.



Ordering at vP: **O<S**< NQ_{subj} < V<*v*

b. $[_{CP}$ O *adv* $[_{vP}$ t_1 $[_{vP}$ S NQ_{subj} t_1 V *v*]] T C]

c. $[_{CP}$ S_2 O_1 *adv* $[_{vP}$ t_1 $[_{vP}$ t_2 NQ_{subj} t_1 V *v*] T C]

Ordering at CP: **S<O**<adv<NQ_{subj}<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 Spec of the *v*P), the object also scrambles to the left of the NQ_{subj}. Since the subject and NQ_{subj} form a constituent within a DP, the object cannot move into a DP-internal position between S and NQ_{subj}. When the *v*P is spelled out, the ordering in (24a) is established (**O<S**<NQ_{subj}<V<*v*). Note crucially that the scrambled object must precede *both* the subject and the NQ_{subj} in the *v*P.[21]

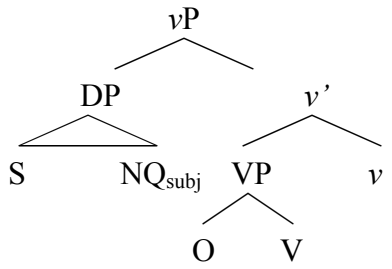
After the Spell-out of *v*P, the object may move further to the left of the high adverb in the next Spell-out domain, as in (24b). Suppose now that to create the word order in (22), the subject moves over the scrambled object, as described in (24c). When the CP in (24c) is spelled out, the ordering statements in (24c) are established.

Notice that the new orderings added in the CP domain are *inconsistent* with the orderings established in the *v*P domain. In particular, in the *v*P 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 turn to Case–II, where the object does not undergo scrambling at *v*P:

(25) *Case-II: the object does not scramble in vP*

a.



Ordering at vP: S< **NQ_{subj}< O** < V < *v*

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

Ordering at CP: S<**O**<adv**<NQ_{subj}**<V<*v*<T<C [**ordering contradiction!**]

When the *v*P 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 *v*P domain. After the Spell-out of *v*P, 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 *v*P domain. In particular, in the *v*P 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 *v*P-scrambling (24) or not (25), the object cannot intervene between the subject and the NQ_{subj} under Cyclic Linearization. If the object scrambles in *v*P, it must precede *both* the subject and the NQ_{subj}. If the object does not scramble in *v*P, it must follow *both* the subject and the NQ_{subj}.

One of the crucial assumptions of the current analysis is that the subject is directly merged in [Spec, *v*P], and thus cannot *v*P-scramble. If the subject were able to scramble from the inner Spec to the outer Spec of *v* (to the left of the scrambled object within the *v*P), as in (26), the linear ordering in (22) would have been incorrectly allowed. Under my approach, (26) is ruled out by a consideration of what is a possible probe-goal relationship. Specifically, [Spec,*v*P] is not in the search space (c-command domain) of *v* (Chomsky 2001). Hence, no scrambling is possible from [Spec,*v*P] to [Spec,*v*P]. (In section 3, it is shown that a subject that is not externally merged in [Spec,*v*P] 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.[23]

(26) <u>*Unavailable Scenario*</u>*:* subject scrambling from [Spec,*v*P] to [Spec,*v*P]

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

Linearize vP: $\underline{S<O<NQ_{subj}<V<v}$ [**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 Spec 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 *v*P domain, the object may scramble to the left of the subject *before* the Spell-out of *v*P. Hence, the subject may always intervene between the object and the NQ_{obj}. This is demonstrated in (27), for (9) with licit multiple scrambling (cf. (22) with illicit multiple scrambling).[24]

(27) *Licit Multiple Scrambling*

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

Ordering at vP: **O<S**< NQ_{obj} < V<*v*

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

Ordering at CP: **O<S**<adv<NQ_{obj} < 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* relationship) and Cyclic Linearization of syntactic units. Cyclic Linearization requires the linear ordering between elements in a spell-out domain *v*P to be fixed when the *v*P 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 *v*P, it follows that the object cannot intervene between the subject and its NQ in the higher domains as well. In the reminder of the paper, 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 vs. nonsubject asymmetry (section 2.2), high vs. low adverb asymmetry

(section 2.3), unaccusative/passive vs. unergative asymmetry (section 3), various types of asymmetries in possessor raising constructions (section 4), and asymmetries between two distinct types of floating quantifies (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.

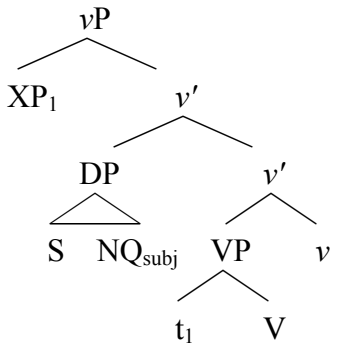
2. Subject vs. Nonsubject Asymmetry

In this section, I argue that every element base-generated within *v*P 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

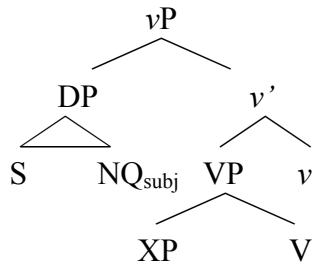
Thus far, I have argued that the subject does not undergo scrambling within *v*P because it is externally merged at the Spec of a Spell-out domain head *v*. This argument makes the following prediction: *no element that is base-generated in vP can intervene between the subject and its associate NQ*.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

(28)



Linearize vP: **XP<S< NQ$_{subj}$**<V<*v*

(29)



Linearize vP: **S<NQ$_{subj}$<XP**<V<*v*

As schematized in (28), if a nonsubject element undergoes scrambling in *v*P, it must scramble to the left of *both* the subject and the NQ$_{subj}$. If a nonsubject element does not undergo scrambling, as in (29), it must follow *both* the subject and the NQ$_{subj}$. The subject merged in [Spec,*v*P] cannot move to revise these two possible orderings within *v*P. Therefore, given Linearization Preservation, we predict that a nonsubject element in *v*P cannot separate the subject and the NQ$_{subj}$. 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 *v*P-Internal Arguments

As predicted, *v*P-internal arguments uniformly cannot split the subject and its associate NQ$_{subj}$. This is illustrated by (30) where the relevant argument is an indirect object, and also by (31) where the relevant argument is a PP (see Miyagawa 1989 for Japanese, who to my knowledge first observed this paradigm in Japanese).[25]

(30) a. **Haksayng-tul-i** **sey-myeng** Mary-eykey maykcwu-lul cwu-ess-ta

Student-Pl-NOM 3-CL M-DAT beer-ACC give-PAST-DEC

'Three students gave Mary beer'

b. ?***Haksayng-tul-i** Mary-eykey **sey-myeng** maykcwu-ul cwu-ess-ta

Student-Pl-NOM M-DAT 3-CL beer-ACC give-PAST-DEC

'Three students gave Mary beer'

(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 (*v*P-external) vs. Low (*v*P-internal) Adjuncts Asymmetry

We have seen that the subject and the NQ $_{subj}$ can be separated by a high adverbial merged outside *v*P [(6-7)]. This is because a high adverb is not linearized with respect to the subject at the Spell-out of *v*P. 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 adverbial merged *within v*P. Since the low adverb is introduced before the Spell-out of *v*P, the subject must be linearized with respect to the low adverbial at *v*P, as in the case of IO, DO, and PP. We then predict that the subject

and the NQ_{subj} cannot be separated by the low adverbial, in contrast to 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_{subj}, in contrast to the high adverb *pwunmyenghi* 'evidently' in (32b) (see also Miyawaga 1989, 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 patassta
Student-Pl-NOM deliberately 3-CL ball-ACC received
'Three students received a ball deliberately'[26]

b. **Haksayng-tul-i** *pwunmyenghi* **sey-myeng** kong-ul patassta
Student-Pl-NOM evidently 3-CL ball-ACC received
'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.)

(33) a. ?*[S *low adjunct* NQ_{subj} 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_{subj} O V][27]

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_{subj} in (32)-(33) disappears when we employ an object-oriented NQ_{obj}, as demonstrated in (34).

(34) a. **Kong-ul** haksayng-tul-i *ilpwule* **sey-kay** patassta

Ball-Acc student-Pl-Nom deliberately 3-Cl_{thing} received

'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_{thing} 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 *v*P, the object and NQ_{obj} can be reordered with respect to the low adverb *before* the Spell-out of *v*P. [28] This is illustrated in (35a). Moreover, as illustrated in (35b), the object and the NQ_{obj} 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. $[_{vP}$ O_1 $[_{v'}$ S L-adv t_1 NQ_{obj} V *v*]]: (34a)

Ordering at vP: O<S<L-adv<NQ_{obj}<V<*v*

b. $[_{CP}$ O_1 S_2 H-adv $[_{vP}$ t_1 $[_{v'}$ t_2 t_1 NQ_{obj} V *v*]] T C]: (34b)

Ordering at vP: O<S<NQ_{obj}<V<*v*

Ordering at CP: O<S<H-adv<NQ_{obj}<V<*v*<T<C

The arguments from the high-low adverb asymmetry provide us with another immediate prediction: if a certain adverb can be merged either in a high (*v*P-external) or low (*v*P-internal) position, the floating quantifier construction will disambiguate the syntactic position of the adverbial. Specifically, only the high adverbial reading will emerge when an ambiguous adverb intervenes between the subject and the NQ_{subj}. This prediction is borne out as well.

As illustrated in (36), subject-oriented adverbials (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
	J-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_{subj}. As illustrated in (38), the intervening adverb retains only the high adverbial reading, in contrast to (37).[29] The paradigm established here thus implies that the floating quantifier construction provides a useful diagnostic to test whether a certain adverbial is merged within or outside *v*P.

(37) **Haksayng-tul-i** **yel-myeng** mwulyeyhakey maykcwu-lul masiessta
Student-Pl-NOM 10-CL rudely beer-ACC drank
(?)?'*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 masiessta
Student-Pl-NOM rudely 10-CL beer-ACC drank
'*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 vs. Unergative Subject Asymmetry

So far, I have argued that the subject and NQ_{subj} cannot be separated by a *v*P-internal element, assuming that the subject is externally merged in [Spec,*v*P] and thus cannot *v*P-scramble. This argument predicts that if the subject is not externally merged at [Spec,*v*P],

the subject and NQ_{subj} may be separated by a *v*P-internal element. In this section, I show that this prediction is corroborated by Miyagawa's (1989) observations.

3.1. Unaccusative/Passive vs. Unergative Asymmetry

Miyagawa (1989) observes a contrast between the unaccusative/passive and unergative subject in Japanese: while the unaccusative and passive subject can be separated from its associate NQ_{subj} by an adverbial 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).[30]

(39) Ecey, **catongcha**-ga koyhan-eykey **twu-tay** pwuswu-eci-ess-ta
Yesterday, car-NOM robber-DAT 2-CL break-PASS-PAST-DEC
'Yesterday, two cars were broken by a robber' (passive, S<PP<NQ_{subj})

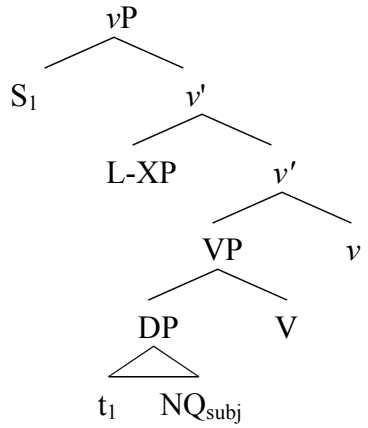
(40) **Koyangi**-ka i pyeng-ulo **sey-mari** cwuk-ess-ta
Cat-NOM this disease-by 3-CL die-PAST-DEC
'Three cats died from this disease' (unaccusative, S<PP<NQ_{subj})

(41) ?***Haksayng-tul**-i caki-uy ton-ulo **twu-myeng** cenhwaha-yess-ta
Student-Pl-NOM self's money-by 2-CL telephone-PAST-DEC
'Two students telephoned with their own money' (unergative, S<PP<NQ_{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 (Perlmutter 1978, Belletti and Rizzi 1981, Burzio 1986, Miyagawa 1989, among others), we expect that the derived subject may behave just like the object in terms of linearization.

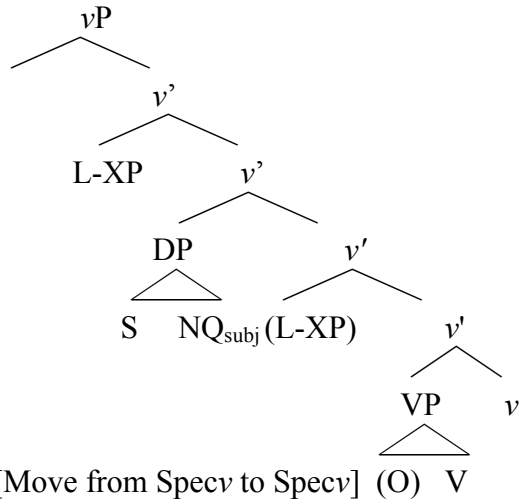
In particular, if the subject is base-generated within VP and may undergo movement to [Spec,*v*P], it is expected that the subject can indeed revise the word order with respect to the (low) adverb phrase before the Spell-out of *v*P, as demonstrated in (42).[31] Furthermore, given the hypothesis that an unergative subject is base-generated in [Spec,*v*P], just like the subject in transitive *v*P (Hale and Keyser 1993, Chomsky 1995, among others), it is also predicted that low adjunct phrases such as *caki-uy ton-ulo* 'with self's money' in (41) cannot intervene between the unergative subject and the NQ_{subj}. This is illustrated in (43).[32]

(42) *Unaccusative/passive subject*



Linearize vP: **S< L-XP <NQ$_{subj}$<V<*v***

(43) *Unergative subject*



Linearize vP: L-XP<S< NQ$_{subj}$<(L-XP)<V<*v*

Another prediction that follows from my analysis is that the asymmetry between the unaccusative/passive and unergative subject 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 *v*P. Thus, it does not matter for the purpose of linearization of the subject and a high adverb whether the subject is base-generated within VP or in [Spec,*v*P]. 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).[33]

(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'

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 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.

4.1 Prediction: Distribution of Possessor and Possessee

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.[34] Some examples are given in (45) to illustrate multiple nominative and accusative marking in the IPC.

(45) a. **John-i** **apeci-ka** pwuca-ta

J-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

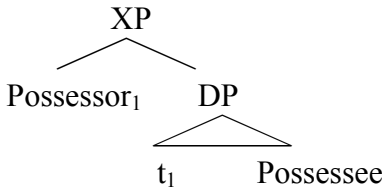
'Mary grabbed John's leg'

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

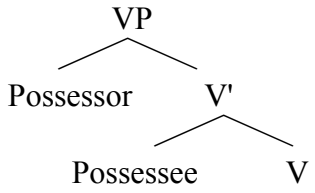
One camp, the **Constituent approach**, argues that the possessor is a direct argument of the possessee and is extracted from a DP containing the possessee for Case reasons, as described in (46) (See Choe 1987, Ura 1996, and Cho 2000, among others, for Korean).[36]

The other camp, 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) (Yoon 1990, Kim 1989, 1990, Sim 2004, and Tomioka and Sim 2005, among others, for Korean).[37]

(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 do not form a constituent, as in (47), we predict that the (stranded) possessee will behave like other adjuncts merged within *v*P (a low adverb in (34a), for example). 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.[38] The data consistently shows that the latter prediction is correct (but see fn. 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).[39]

(48) a. ***John-i** kong-ul **apeci-ka** cha-ss-ta
J-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
J-ACC M-NOM leg-ACC kick-PAST-DEC
'Mary kicked John's leg' (cf. (1b))

Second, just like the paradigms with floating NQs in (30)-(32), *v*P-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, *v*P-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

J-NOM M-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?'*] [40]

a. ***John-i** *yelsimhi* **apeci-ka** wupyo-lul mou-si-n-ta[41]

J-NOM diligently father-NOM stamp-ACC collect-HON-PAST-DEC

'John's father collects stamps diligently' (cf. (32a), (33a))

b. ?**John-i** **apeci-ka** *yelsimhi* wupyo-lul mou-si-n-ta

J-NOM father-NOM diligently stamp-ACC collect-HON-PAST-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

J-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** toycik-ul ha-si-ess-ta

J-NOM last.year-in father-NOM retire-Acc do-Hon-Past-Dec

'John's father retired last year'

Third, just like the paradigms with a floating NQ in (34)-(35), the high-low adverb asymmetry in (50)-(51) disappears if an O-Possessee is employed:

(52) **John-ul** Mary-ka ipwule /pwunmyenghi **tali-lul** capassta
J-ACC M-NOM deliberately/evidently leg-ACC grabbed
'(Evidently) Mary grabbed John's leg (diligently).' (cf. (34))

Fourth, as in the paradigms with NQ in (39)-(41), the passive/unaccusative subject behaves like the object in that a derived S-Possessor and its possessee can be separated by a *v*P-internal element, in contrast to unergative subject paradigms:

(53) **John-i** Mary-eykey **sonmok-i** cap-hi-ess-ta
J-NOM M-DAT wrist-NOM grab-PASS-PAST-DEC
'John's wrist was grabbed by Mary' (cf. (39))

(54) **John-i** ku pyeng-ulo **aki-ka** cwuk-ess-ta
J-NOM that disease-by baby-NOM die-PAST-DEC
'John's baby died from this disease' (cf. (40))

(55) [*a possible context: 'whose father called deliberately (during the lecture)?'*]

a. ***John-i** ilpwule **apeci-ka** cenhwahay-ss-ta
J-NOM deliberately father-NOM telephone-PAST-DEC
'John's father telephoned deliberately' (cf. (41))

b. ?**John-i** **apeci-ka** ilpwule cenhwahay-ss-ta

J-NOM father-NOM deliberately telephone-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 stranded possessee shows the distribution, in a strikingly similar way as the stranded 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 of it. [42]

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

5. Asymmetries Among Floated Quantifiers

Unlike the NQ paradigms 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 universal quantifier *motwu* 'all' and a Negative Polarity Item (NPI) *amwuto* 'anyone' (O'Grady 1991, Kwak 1995, Kang 2002, among others for Korean; Ishii 1998 for Japanese).[43]

(56) S<O<FQ_{subj}<V

a. **Haksayng-tul -i** khempywuthe-lul **twu-myeng-i/ina/man** sassta
Student-Pl-NOM computer-ACC 2-CL-NOM/Delimiter/only bought
'Two/even two/only two students bought computers'

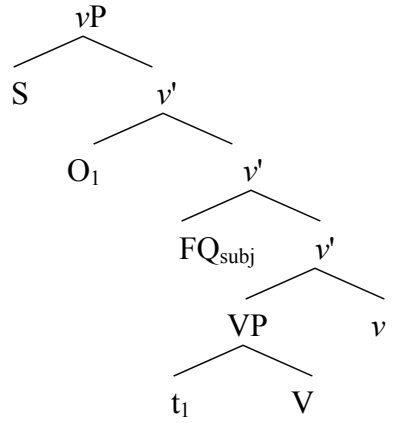
b. **Haksayng-tul-i** sakwa-lul **motwu-(ka)** mek-ess-ta
Student-Pl-NOM apple-ACC all eat-PAST-DEC
'All the students ate apples'

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

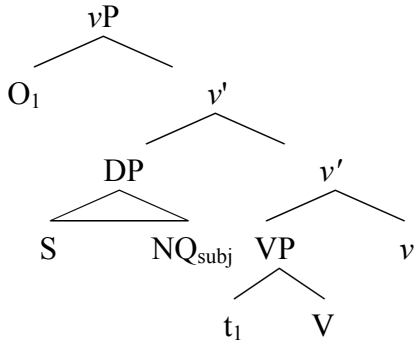
constituent, the object could move to a position between the subject and the floated NQ before the Spell-out of *v*P, as illustrated in (57). I argue that (57) is indeed the underlying structure for floating quantifiers in (56) (cf. (58)).[44]

(57) *Floating-QP in (56)*



[**S<O<FQ$_{subj}$**<V<*v*]

(58) *Caseless NQ in Sections 1-4*



[**O<S<NQ$_{subj}$** < V<*v*]

This account makes an immediate predication: *all other asymmetries observed with Caseless floated 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_{subj} or move to [Spec,*v*P] to the left of FQ_{subj} before the subject merges (just like the object in (57)). This prediction is correct, as exemplified in (59).

(59) *Subject<Low adverb<Subject-oriented FQ* (cf. (32)-(33))

a. **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'

b. **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'

c. **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 *v*P-internal element can be externally merged in (or move to) a position between the unergative subject and the FQ_{subj}, we expect that the *v*P-internal element may intervene between the subject and 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))

a. **Haksayng-tul-i** ku khadu-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.'

b. **Haksayng-tul-i** ku khadu-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.'

c. **Haksayng-tul-i** ku khadu-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 support the claim that the floating QPs in (56) do not form a constituent with its host NP, and that there are in fact two types of floating quantifiers in Korean.[45] As a reviewer notes, however, further research is required to examine if my conclusion for underlying structure of floating quantifiers in (56) can be independently supported (see Ko 2005a for some preliminary evidence for the current conclusion from Case concord and mismatch phenomena in FQ constructions.)

This conclusion has also an implication for the effect of focus on Caseless NQ constructions noted earlier (fn. 2). When focus is imposed on numerals, the asymmetries observed with 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 the speakers to analyze a Caseless NQ as a focused NQ (such as *2-myeng-man* '2-Cl-only' in (56)). In other words, due to the focus imposed on the NQ, the Caseless NQ can be analyzed as the type of QPs in (56) with a covert focus particle.[46] I leave substantiation of this suggestion for further research.

6. Concluding Remarks

In this paper, we have observed a variety of asymmetries in scrambling. The subject may intervene between the object and its NQ while the object may not intervene between the subject and its NQ (section 1). The indirect object, PP-argument, and *v*P-internal adjuncts may not intervene between the subject and its NQ while *v*P-external adverbs may (section 2). Unaccusative and passive subjects can be separated by *v*P-internal elements from their NQ while unergative subjects cannot (section 3). Possessor raising constructions show the same type 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 paper, I have argued that all these asymmetries can receive a principled account by the proposal that scrambling is constrained by Cyclic Linearization. In particular, I have provided evidence for the claim that possible linear orderings must be determined at the smallest Spell-out domain in which elements are introduced. If successful, my arguments establish novel evidence for 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, scrambling is conditioned by a legitimate probe-goal configuration, so that no scrambling is allowed from one Spec to another Spec of the same head. My arguments thus provide further support for the line of approaches 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 paper, I simply assumed that *v*P and CP are Spell-out domains for Korean, but I have remained agnostic about what determines Spell-out domains in languages (see section 1.2.2, fn.14 and fn.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 still remains to be seen whether maximal categories other than *v*P and CP may constitute a Spell-out domain in languages. If so, it must be examined which projection may constitute a Spell-out domain, and what factors would determine the Spell-out domain. If there are parametric variations in the determination of Spell-out domains in languages, how children acquire this variation would also be an important research question. I hope that this paper will provide a useful background to probe these issues in future research.

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[1]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.) This paper focuses primarily on the type (iia) numerals, and turns to the type (iib) constructions in section 5.

(i) a. [Haksayng(-tul) sey-myeng]-i
[Student(-Pl) 3-CL]-NOM

b. [Sey-myeng-uy haksayng(-tul)]-i
[3-CL-Gen student(-Pl)]-NOM

(ii) a. [Haksayng(-tul)-i] [sey-myeng]
Student(-Pl)-NOM 3-CL

b. [Haksayng(-tul)-i] [sey-myeng-i]
Student(-Pl)-NOM 3-CL-NOM

[2]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 it is never comparable to (1b) (Kang 2002). This paper deals primarily with the paradigms without focus (in an out-of-the-blue context), and discusses the effect of focus in NQ constructions in section 5 briefly. 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.

[3] 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, unimportant morphemes are not glossed for the sake of space (ex. *malhayess-ni* (said-Q) instead of *malha-yess-ni* (say-Past-Q)).

[4]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.

[5] Hoji (1985) independently argues that the subject cannot undergo string-vacuous scrambling based on the fact that Japanese shows scope rigidity between the subject and the (unscrambled) object. I do not discuss scope rigidity in this paper. Notice, however,

that Hoji's claim does not extend to (3). In (3), the result of multiple scrambling is not string-vacuous due to the presence of the NQ_{subj}.

[6]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 *v*P-internal subject hypothesis (Kitagawa 1986, Kuroda 1988, Koopman and Sportiche 1991, among others), 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 (p.c.) for pointing this out to me.

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

[7] To avoid parsing difficulty, a topic-marked matrix subject is employed in (4) (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.

[8] 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 (in press, a, b), I provide further evidence for this claim from acquisition of *wh*-questions in Korean. See also Miyagawa (1989), Ueda (1990), Fujita (1994), Koizumi (1994) among others, for paradigms showing that high adverbs like temporal/locative adverbs may intervene between the subject and its NQ in Japanese.

[9] One may wonder whether (2b) can be explained on the assumption that a scrambled object at the *v*P edge triggers an intervention effect for subject scrambling (Noam Chomsky, p.c.). It is unclear, however, how the derivation in (i) can be excluded by this assumption.

(i) $[_{CP}$ S O (adv) $[_{TP}$ t_s (adv) $[_{vP}$ t_o t_s NQ_{subj} t_o V *v*] T] C]

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

[10] 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 paper, I adopt F&P's Spell-out system and present some differences between the two proposals relevant for the

current paper (see fn. 11, fn. 13, fn. 15, and fn. 22). For a comprehensive comparison of F&P and Chomsky's Spell-out, see Fox and Pesetsky (2005a) and Ko (2005a).

[11] In this paper, 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 original descriptions of Cyclic Linearization. Note, in particular, that under F&P, both the specifier and the complement of a Spell-out Domain head are linearized via Spell-out (cf. Chomsky 2001 who argues that only the complement of a phase head is spelled-out). For instance, if *v*P is a Spell-out domain, both S (Spec) and O (Complement) are linearized with respect to the verb (the head) at the Spell-out of *v*P. I adopt F&P's assumption here.

[12] Strictly speaking, the ordering statement added in (11b) is "Z precedes the first non-trace element of *v*P, 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}. F&P offer a more statement of the formal properties of the collection of orderings in the ordering table in PF.

[13] As F&P discuss, the contrast between (12) and (13) shows that F&P's Cyclic Linearization derives "successive cyclicity" of certain types of movement (e.g. *wh*-movement) without invoking Chomsky's (2001) *Phase Impenetrability Condition*.

[14] 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).

[15] It is in fact a controversial issue what constitutes a Spell-out domain in languages. Chomsky proposes that Spell-out applies only to "propositional" phases, namely *v*P and CP (but see Matushansky (2005) for counterarguments). Others argue that other maximal projections such as VP, PP, and ApplP can also be a Spell-out domain (McGinnis (2001), Fox and Pesetsky (2003, 2005a,b), Abels (2003), Sabbagh (2003), Lee-Schoenfeld (2005), and Ko (2005a), among others, for discussion). In this paper, I do not provide any insightful answer for this issue. Rather, I simply adopt the assumption that *v*P and CP are Spell-out domains for Korean, and 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: Chapter 3), I suggest that the domains of theta-role assigners (VP and *v*P) 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 paper, however, is crucially affected by this modification. See section 6 for a general discussion of Spell-out domains.

[16] For the sake of space, I omit technical details regarding implementations of the EPP feature. See Ko (2005a) for detailed descriptions. 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 pursed any further in the paper. See Saito (1985), Fukui (1986, 1993), Kuroda (1988), Tada (1993), Miyagawa (1997, 2001), Saito and Fukui (1998), Takano (1998), Bošković and

Takahashi (1998), Bailyn (2001), Boeckx (2003), and Yang and Kim (2005), among many others, for diverse perspectives on optionality of scrambling.

[17] See Kuroda (1983), Déprez (1989), Ueda (1990), Shlonsky (1991), Merchant (1996), Cinque (1999), Benmamoun (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.)

[18] In this paper, I do not discuss the interactions between double object constructions and Cyclic Linearization. See Ko (2005a: Chapter 3) for a comprehensive discussion devoted to this topic. Nothing in this paper crucially hinges on the arguments developed there.

[19] 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 bound morphemes (e.g. '*ess* 'PAST', *ta* 'Declarative') are combined with their host via head movement or morphological merge.

[20] For clarification, it does not matter for linearization whether the subject in (21b) stays in [Spec,*v*P] or moves to [Spec,TP] (cf. Miyagawa (2001) who argues that the subject must move to [Spec,TP] in contexts like (21b)). The same concern applies to (21d).

[21]If the subject and the NQ_{subj} were not a constituent at *v*P, the object may move into a position between S and NQ_{subj} in the *v*P domain, and the illicit order ($S<O<NQ_{subj}$) would

be incorrectly permitted. Hence, to the extent that my analysis is correct, it provides support for the view that NP and NQ form a constituent in their base position (see also fn. 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 ($S<O<QP_{subj}$).

[22] Under F&P, 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. Chomksy 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).

[23] 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 anti-locality constraint like (i) cannot capture the ungrammaticality of (26) (see Saito and Murasugi 1999, Bošković 1994, 2005, Abels 2003, and Lee 2004 for anti-locality constraints). Since the movement of the subject NP from inside DP to [Spec,*v*P] in (26) crosses a maximal projection DP, (26) would be ruled in under (i).

(i) Each chain link must be at least length of 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)

[24] 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 claims that multiple scrambling is a result of a derivation that one item adjoins to

the other and subsequently those combined items scramble together. I thank a reviewer for clarifying this point.

[25]As expected, sentences like (i) and (ii), where two *v*P-internal XPs intervene between S and NQ_{subj} 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-ul **sey-myeng** cwu-ess-ta
Student-Pl-NOM M-DAT beer-ACC 3-CL give-PAST-DEC
'Three students gave Mary beer'

(ii) ***Haksayng-tul-i** maykcwu-lul kyosil-lo **sey-myeng** kacyewa-ss-ta
Student-Pl-NOM beer-ACC classroom-to 3-CL bring-PAST-DEC
'Three students brought beer to the classroom'

[26] David Pesetsky (p.c.) 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, an anonymous *LI* reviewer, p.c.) accept only the former reading.) Korean *ilpwule* 'deliberately' allows only the former reading where the subject is the agent of the deliberate decision.

[27] A reviewer notes that 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.

[28] The grammaticality of (i) provides further support for my claim that a floated NQ is not an adverb. If a floated NQ_{subj} were an adverb that does not form a constituent with the subject, we would expect that the object may scramble to the left of the NQ_{subj} and yield the order ($S<O<NQ_{subj}$), just like (i), contrary to the fact in (2b). (I thank Danny Fox (p.c.) for stressing the importance of the grammaticality of (i).)

(i) Haksayng-tul-i **kong-ul** *ilpwule* **sey-kay** patassta
Student-Pl-NOM ball-ACC deliberately 3-CL_{thing} received
'Students received three balls deliberately' (cf. (2b) and (3))

To accommodate the contrast between (i) and (2b) under the claim that a floated NQ is an adverb, one would have to postulate that an NQ_{subj} is a special type of an adverb that must be adjacent to the subject before the spell-out of *v*P. At this moment, however, there is no independent reasoning to support such a constraint.

[29] For reasons 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 masiessta

Rudely student-Pl-NOM 10-CL beer-ACC drank

'*It was rude that* ten students drank beer'

'Ten students drank beer *in a rude manner*'

[30] 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 do not see any 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'

[31] For clarification, the analysis in (42) can be made compatible with the claim that weak phases (unaccusative/passive *v*Ps) do not undergo Spell-out (Chomsky 2001; cf. Legate 2003). In particular, if weak phase *v*Ps 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 *v*P must undergo Spell-out. Thus, I do not pursue

Chomsky's weak phase theory here. The analysis (42) also raises a question of whether the movement in (42) is A- or A'-movement (David Pesetsky, p.c.). Given that a passive subject can A-bind into an NP in an agentive by-phrase, I assume that this movement can be A-movement. Further research, however, is needed to see whether the binding in (i) is due to later scrambling of the passive subject to [Spec,TP] rather due to scrambling to [Spec,*v*P].

(i)$^{(?)}$Haksayng-tul-i_i caki-uy_i 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 self's teacher.'

(ii)$^{?*}$Caki-uy_i sensayng-nim-eykey haksayng-tul-i_i twu-myeng pwuthcap-hi-ess-ta

[32] Some accusative Case marked locative PPs may intervene between a subject and 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 the bridge.'

Following Miyagawa (1989:40 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.

[33] 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 predicates. This, however, cannot be an alternative account for

the asymmetries in scrambling observed here (and corresponding Japanese paradigms). In particular, it is not obvious how Nakanishi's proposal would account for 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 a range of 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.

[34] I assume a relation that is inborn, inherent, or not conferred by purchase, such as body-part, kinship, and part-whole as inalienable possession relationship (adopting Choe 1987, Yoon 1990, Ura 1996, among many others).

[35] See Chun (1985), Choe (1987), Kang (1987), Yoon (1990), Kim (1989, 1990), Gerdts (1991), Maling and Kim (1992), Kitahara (1993), D.–I. Cho (1993), Ura (1996), S. Cho (2000), and Sim (2004), among many others, for discussion of IPCs in Korean.

[36] 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 approach.

[37] 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, argue 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 possessor as its argument. It is worth noting, however, that these studies for the Nonconstituent approach discuss only the 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).

[38] This prediction was pointed out to me by Norvin Richards (p.c.), and the theoretical implication of this prediction for the nature of possessor raising was pointed out to me by David Pesetsky (p.c.). I thank them for these key comments.

[39] I employed kinship IPC for (48a) and 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 body part IPC is employed. (For reasons 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

J-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))

[40] Contexts in (50) and (51) are given 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 subtle judgment variations among them.

[41] Hajime Hoji (p.c.) reports to me that the contrast between high-low adjuncts in (50)-(51) is rather weak in Japanese though the subject-object asymmetry in (48a) and (48b) is quite robust. As Hajime Hoji pointed 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-low adjuncts may be accommodated. But, the robust contrast between the subject and the object scrambling in IPCs would remain unexplained. I leave this for future research.

[42] Importantly, however, the conclusion drawn here should be limited to multiple nominative IPCs. Specifically, whether the O-Possessor and the O-Possessee form a constituent in underlying structure, the O-Possessor may move to the left of the subject or a low adverb within *v*P. This may derive the subject-object asymmetries seen here. In Ko (2005a: Chapter 4), I provide other diagnostics to test underlying structure and show that the Nonconstituent approach can in fact be supported for multiple accusative IPCs.

[43] The generalization in (56) extends to Japanese, with one exception that Japanese lacks the paradigm in which a Case-marked NQ is preceded by a Case-marked NP (cf. (56a)).

[44] 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) also argued

that it is necessary to assume two types of floating quantifiers in Japanese: VP-modifier and NP-modifier. Departing from the previous studies, however, I leave the grammatical category of the FQs in (56) open.

[45] One remaining issue, though not crucial for the current paper, is why there exist two types of floating QPs in Korean and what are the exact characteristics of the QPs in (56) (e.g. 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 *v*P) 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 NQ_{subj}. Further research is required to examine whether there exists independent evidence for positing such an extra head introduced by focus/case particles within *v*P.

[46] David Pesetsky (p.c.) suggested to me that the fact that Case in Korean can be dropped would also be a factor. If the Case in an NQ is optional, an NQ in 'NP-NQ' sequence is always ambiguous between a true Caseless NQ in (58) and a null-Case marked NQ 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.