

Constraining Scrambling: Cyclic Linearization and Subject Movement

Heejeong Ko

Massachusetts Institute of Technology

1. Introduction

In this paper, I investigate how the linear ordering of syntactic units is determined in scrambling constructions. I propose that word order variation in scrambling is not random, but strictly constrained by properties of the phonology-syntax interface – in particular, *Cyclic Linearization* (Fox and Pesetsky 2003; cf. Chomsky 1999). Specifically, I show that as a consequence of cyclic Spell-out, scrambling must preserve the linear ordering established at the previous Spell-outs. Supporting evidence for this proposal is drawn from some peculiar restrictions on subject scrambling and distribution of numeral quantifiers in Korean. Arguments in this paper also provide evidence for the following claims: (i) there is no general ban on subject scrambling, (ii) there is no movement from one Spec to another Spec of the same head, and (iii) certain restrictions for scrambling in Korean and Object Shift in Scandinavian languages receive a unified account under the cyclic Spell-out approach.

I begin with a well-known puzzle (section 2): the subject cannot scramble so as to strand a subject-oriented Numeral Quantifier (NQ) across the object, whereas the object can strand an object-oriented NQ across the subject. I show that there is no general ban on subject scrambling; hence,

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- (1) a. [O S t_{obj} NQ_{obj} V]
Maykcwu-lul₁ John-i t₁ **sey-pyeng** masiessta
 Beer-Acc J-Nom 3-Cl_{bottle} drank
 ‘John drank three bottles of beer.’
- b. *[S Ø t_{subj} NQ_{subj} t_{obj} V]
 ***Haksayng-tul-i₂** maykcwu-lul₁ t₂ **sey-myeng** t₁ masiessta
 Student-Pl-Nom beer-Acc 3-Cl_{person} drank
 ‘Three students drank beer.’

As argued by Kuroda (1983), the grammaticality of (1a) is naturally explained 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 (see also Sportiche 1988).

The ungrammaticality of (1b), however, is puzzling, as pointed out by Saito (1985). If the subject *haksayng-tul-i* in (1b) can scramble over the scrambled object *maykcwu-lul*, there is no obvious reason why the subject cannot be separated from the NQ_{subj} *sey-myeng*. Given this subject/object asymmetry, Saito argues that the subject cannot scramble and thus cannot move to the left of the object in (1b).^{3,4}

Contrary to Saito’s claim, however, there is evidence that the subject can indeed scramble (Lee 1993, Sohn 1995, Ko, to appear). First, as shown in (2), the embedded subject may scramble over a matrix subject (with some parsing difficulty).⁵ Furthermore, the embedded subject can strand an NQ_{subj} across a matrix subject, as shown in (3).

- (2) John-i₁ [na-nun [t₁ Mary-lul mannassta-ko] sayngkakhanta]]
 J-Nom I-Top M-Acc met-C think
 ‘John, I think that __ met Mary.’ (adapted from Sohn 1995)

3. Assuming that the subject is base-generated in [Spec,IP], Saito argues that the subject cannot scramble because its trace in [Spec,IP] cannot be lexically-governed. However, as shown in (i), once we adopt the vP-internal subject hypothesis, the subject *can* move to [Spec,IP] over the scrambled object in vP, leaving its trace lexically-governed by the verb. Thus, (1b) remains puzzling under the vP-internal subject hypothesis. I thank Mamoru Saito (p.c.) for pointing this out to me.

(i) [IP Subj₁ [vP Obj₂ [vP t₁ NQ_{subj} [vP t₂ V]]]]

4. Hoji (1985) independently argues that the subject cannot scramble 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.

5. To avoid parsing difficulty, the topic-marked matrix subject is employed in (2). (see Sohn 1995 for parsing strategies in double nominative constructions).

- (3) **Haksayng-tul-i**₁ [na-nun [t₁ **sey-myeng** Mary-lul mannassta-ko]
 Student-Pl-Nom I-top 3-Cl M-Acc met-C
 sayngkakhanta]]
 think ‘Students, I think that three __ met Mary.’

Moreover, as argued by Ko (to appear), the subject can scramble within a clause boundary in certain contexts. For example, the subject may be separated from the NQ_{subj} by a high adverb such as *way* ‘why’: (4)

- (4) [**Haksayng-tul-i**₁ *way* t₁ **sey-myeng** hakkyo-lul ttenassnun-ci](anta)
 Student-Pl-Nom why 3-Cl school-Acc left-Q (know)
 ‘(I know) why three students left the school.’

The data in (2)-(4) can be straightforwardly explained if we assume that the subject can undergo scrambling. This, however, leaves the contrast in (1) unresolved again. In fact, the subject/object asymmetry is not limited to (1), which implies that we cannot simply resort to a stipulation for (1).⁶

The paradigm in (5)-(6) further confirms Saito’s insight that subject scrambling is impossible in the context where object scrambling is possible. As illustrated in (5), when the subject and the object scramble together over a high adverb, the subject *cannot* strand the NQ_{subj} over the object. In contrast, the object *can* strand an NQ_{obj} over the scrambled subject and a high adverb, as shown in (6).

- (5) ^{*7}[S₁ O₂ *adv* t₁ NQ_{subj} t₂ V]
^{*7}**Haksayng-tul-i**₁ maykcwu-lul₂ *way* t₁ **sey-myeng** t₂ masiess-ni?
 Student-Pl-Nom beer-Acc why 3-Cl_{person} drank-Q
 ‘Why did three students drink beer?’

- (6) [O₂ S₁ *adv* t₁ t₂ NQ_{obj} V]
 Maykcwu-lul₂ **haksayng-tul-i**₁ *way* t₁ t₂ **sey-pyeng** masiess-ni?
 Beer-Acc student-Pl-Nom why 3-Cl_{bottle} drank-Q
 ‘Why did students drink three bottles of beer?’

The floating NQ paradigms thus provide us with the following “Subject Puzzle”:

6. One may wonder whether (1b) can be explained by the assumption that a scrambled object in vP triggers an intervention effect for subject scrambling (Noam Chomsky, p.c.). This account, however, leaves the grammaticality of (2)-(4) contrasting with (1b) unexplained. One might further assume that an adverb does not block scrambling in (4). But, this argument cannot account for the high/low adverb asymmetry discussed in section 4 (refer to Ko (2004) for details).

(7) *The Subject Puzzle*

The subject can undergo scrambling [(2)-(4)]. However, the subject cannot strand the NQ_{subj} across the object [(1b),(5)] in the way that the object strands its NQ across the subject [(1a),(6)].

3. Proposal – Cyclic Linearization and Scrambling

As we have seen, there is no general ban on subject scrambling. In this section, I show that the restriction on subject scrambling follows from general conditions on linearization and movement. Specifically, I argue that the subject puzzle is reduced to the conspiracy of two factors. (i) scrambling is constrained by the PF-Syntax interface condition on *Cyclic Linearization*, and (ii) the subject is a Spec of the Spell-out domain head v .

3.1. Formal Properties of Scrambling

I argue that the linear ordering in constructions with scrambling is constrained by *Linearization Preservation* (8), proposed by Fox and Pesetsky (2003; F&P, hereafter) as a consequence of cyclic Spell-out.

(8) *Linearization Preservation*

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. (Fox and Pesetsky 2003)

F&P argue that certain syntactic domains created in a derivation are *Spell-out Domains*, which roughly correspond to Chomsky's *phase* (e.g. CP, DP, vP/VP). Derivations proceed bottom-to-top and the Spell-out operation linearizes the elements in a given Spell-out domain and establishes the ordering statements in PF.⁷ An ordering statement of the form ' $X<Y$ ' is understood by PF as meaning that the last element of X precedes the first element of Y , to the exclusion of traces.⁸

Take the derivations in (9), for example. In (9a), X precedes Y in the vP domain. Once the vP is spelled-out, the linear ordering $X<Y$ is stored in PF and this ordering cannot be erased or changed, as stated in (8). In (9b), a new element Z is merged in the higher domain CP. After the Spell-out of CP, Z and vP are linearized: Z precedes the first element of vP , i.e. X . Since X precedes Y , Z also precedes Y ($Z<X$, $X<Y \Rightarrow Z<Y$). Given that the new

7. Unlike Chomsky (1999), F&P assume that both *Spec* and *Complement* of the Spell-out Domain head are linearized via Spell-out. I adopt F&P's assumption.

8. F&P adopts the assumption that movement is *remerge* of elements. Thus, under this assumption, traces do not exist (see F&P for further discussions).

ordering statements added in the CP ($Z < X < Y$) are *consistent* with the linear orderings established in the previous domain νP ($X < Y$), the derivation in (9b) poses no problem for PF.

In (9c), the element X merged in νP is remerged in the higher domain (i.e. movement of X in CP). After the Spell-out of CP, the new orderings ($X < Z < \nu P$) are added in PF. Since the first (overt) element in νP is Y , PF obtains the new linearization information, $X < Z < Y$. Given that the ordering in CP ($X < Z < Y$) is *consistent* with the one in νP ($X < Y$), the derivation in (9c) poses no problem for PF.

- (9) a. $[_{\nu P} X \ Y]: X < Y$
 b. $[_{CP} Z \ [_{\nu P} X \ Y]]: Z < \nu P \Rightarrow Z < X < Y^9$
 c. $[_{CP} X_1 \ Z \ [_{\nu P} t_1 \ Y]]: X < Z < \nu P \Rightarrow X < Z < Y$

As F&P discuss, an interesting issue arises concerning derivations such as (10). Suppose that X precedes Y in νP (10a), and Z is merged in the higher domain CP, and Y undergoes movement over Z (10b). When the CP in (10b) is spelled out, PF obtains the information that $Y < Z$ and $Z < \nu P$. Since X is the first element in νP , Z precedes X . Given that Y precedes Z and Z precedes X , Y must precede X at CP.

- (10) a. $[_{\nu P} X \ Y]: X < Y$
 b. $^*[_{CP} Y_1 \ Z \ [_{\nu P} X \ t_1]]: Y < Z < \nu P \Rightarrow Y < Z < X$

Notice, however, that this ordering at CP ($Y < Z < X$) *contradicts* the ordering established at νP ($X < Y$). The ordering at νP indicates that X precedes Y . The ordering at CP indicates that Y precedes X . Thus, derivations like (10b) with an ordering contradiction cannot be pronounced and are filtered out at PF. Note that under this approach, *Linearization Preservation* (8) is not an additional constraint on movement, but a consequence of the natural assumption that ordering statements cannot be erased at PF.

To derive the ordering $Y < X$ from (10a), Y must move *before* the Spell-out of νP , as illustrated in (11a).¹⁰ Crucially, this implies that the revised ordering in (11a) ($Y < X$) needs to be preserved in the higher domain, as in (11b). Otherwise, an ordering contradiction would arise, and the derivation could not be pronounced at PF.

9. $Z < X < Y$ is my notation for the total ordering $\{Z < X, X < Y, Z < Y\}$. Refer to F&P for formal properties of the collection of orderings in the ordering table at PF.

10. As F&P discuss, the contrast between (10b) and (11a) shows that F&P's cyclic linearization system derives "successive cyclicity" of certain types of movement (e.g. *wh*-movement) without assuming Chomsky's *phase impenetrability condition*.

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

F&P show that this formal mechanism for linearization provides a unified account for a variety of restrictions on movement, including the one for Object Shift in Scandinavian languages (*Holmberg's Generalization*: Holmberg 1999). 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. Otherwise, an ordering contradiction arises (cf. Holmberg 1999, Müller 2000, Sells 2001, Williams 2003).

For instance, *henne* 'her' in (12a) 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 (12a)). In contrast, *henne* 'her' in (12b) 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 unavailability of V to C movement in (12b), where the auxiliary *har* 'have' blocks verb movement).

- (12)a. Jag kysste henne inte $[_{vP} t_V t_O]$
 I kissed her not 'I did not kiss her'
 b. *Jag har henne inte $[_{vP} \text{kysst } t_O]$.
 I have her not kissed 'I have not kissed her'

If F&P's argument is correct that Cyclic Linearization restricts any type of overt movement, we predict that scrambling is constrained by the interface properties, just like Object Shift. I show that this is indeed the case. Specifically, linearization information about scrambling at a given Spell-out domain is sent to the phonology permanently, subsequent scrambling must preserve the linear orderings established at the previous domains. Otherwise, an ordering contradiction would arise.¹¹

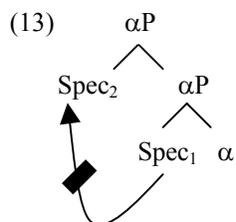
I assume that vP and CP constitute Spell-out domains in Korean.¹² For concreteness, I define scrambling as an operation that takes a non-head overt element and moves it to a Spec of an attracting (probing) head with an EPP feature. When multiple scrambling is triggered by one head, elements move to multiple Specs of the attracting head (Ura 1996). I further assume

11. Note that *Linearization Preservation* (8) is not a constraint on scrambling in syntax. Rather, the illicit derivations with scrambling are filtered out after ordering statements are established in PF as a consequence of (8). I thank Danny Fox and David Pesetsky (p.c.) for stressing the conceptual importance of this point.

12. In Ko (2004), I argue that VP is a Spell-out domain for Korean, in addition to vP. However, nothing hinges on this for present purposes.

that scrambling may occur optionally (Saito 1985, Fukui 1993; cf. Bošković and Takahashi 1998).

One important implication of this approach is that no scrambling is possible from one Spec to another Spec of the same head, as depicted in (13) (cf. Richards 2002 for potentially opposing considerations). Given that Spec₁ and Spec₂ are the multiple Specs of the same head α , it is expected that there is no movement triggered from Spec₁ and Spec₂ in (13). As will be seen shortly, this formal property of scrambling has an important consequence for the syntax of subject scrambling.



3.2. Analysis - Scrambling Paradigms

Given the formal properties of scrambling proposed above, let us consider the paradigms of object scrambling (1a), subject scrambling (4) and multiple scrambling (the subject puzzle) (5)-(6) discussed in section 2.

Starting with object scrambling, I argue that the object first scrambles over the subject to the outer Spec of vP , as described in (14). Once the vP is spelled out, the elements of vP are linearized in PF ($O < S < NQ_{obj} < V < v$). After linearization of vP , new heads are introduced and the syntax continues to merge and remerge elements.

As illustrated in (15), the object in [Spec, vP] may scramble further to [Spec,TP].¹³ When the higher domain CP is spelled-out, the ordering statements at CP in (15) are established ($O < S < NQ_{obj} < V < v < T < C$).¹⁴ Since the ordering statements at vP and CP are *consistent*, the derivation poses no problem for the phonology.

13. 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).

14. I am agnostic about how the bound morphemes in Korean are morphologically realized in Korean. It is immaterial for my arguments whether fully inflected words (e.g. *John-i* 'John-Nom', *mek-ess-ta* 'eat-Past-Dec') are inserted into the syntax, or bound morphemes (e.g. *-i* 'Nominative Case' in T, 'ess' 'Past' in T, *ta* 'Declarative' in C) are combined with their hosting root via movement or morphological merge.

- (14) $[\nu P O_1 \quad [\nu P S \quad t_1 \quad NQ_{obj} V \nu]]$
Linearize νP : $O < S < NQ_{obj} < V < \nu$
- (15) $[\text{CP} [\text{TP} O_1 \quad [\nu P t_1 \quad [\nu P S \quad t_1 \quad NQ_{obj} V \nu]] \text{T}] \text{C}]$
Linearize CP: $O < \nu P < T < C$
 \Rightarrow Ordering at CP: $O < S < NQ_{obj} < V < \nu < T < C$

Let us now turn to subject scrambling. As in the object paradigm seen above, the subject can scramble over a high adverb, as depicted in (16) (for (4)). When the argument structure in (16a) is projected and spelled out, the ordering statements in (16a) are established ($S < NQ_{subj} < O < V < \nu$). Since a high adverb such as *way* ‘why’ is base-generated above νP , it does not participate in the linearization of νP (cf. section 4 for low adverbs in νP).

After the 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 ($S < adv < NQ_{subj} < O < V < \nu < T < C$), as given in (16b). The linearization of CP adds new ordering statements (e.g. $S < adv$), but crucially there is no ordering contradiction between the ordering in νP and the ordering in CP. Hence, the derivation poses no problem for PF. The account of (16) straightforwardly extends to the examples in (2)-(3).

- (16)a. $[\nu P S \quad NQ_{subj} O \quad V \nu]$
Linearize νP : $S < NQ_{subj} < O < V < \nu$
- b. $[\text{CP} S_1 \quad adv \quad [\text{TP} t_1 \quad [\nu P t_1 \quad NQ_{subj} O \quad V \nu]] \text{T}] \text{C}]$
Linearize CP: $S < adv < \nu P < T < C$
 \Rightarrow Ordering at CP: $S < adv < NQ_{subj} < O < V < \nu < T < C$

Recall now the subject puzzle (7): the subject can scramble alone, but when the subject and the object scramble together, the subject suddenly cannot strand an NQ_{subj} across the object: (1b), (5). The object, by contrast, can strand an NQ_{obj} whether it scrambles alone (1a) or scrambles together with the subject (6). This puzzle is in fact an immediate consequence of Cyclic Linearization.

Consider the paradigm of subject scrambling in (17) for (5) (and (1b)).

- (17) $^{*?} [S_1 \quad O_2 \quad adv \quad [\nu P t_1 \quad NQ_{subj} t_2 V \nu] \text{T} \text{C}]$

When the argument structure of (17) is projected, the underlying order in (18) is obtained. Given that scrambling may occur optionally in νP , we

need to consider two logical possibilities: (i) Case I in which the object scrambles in vP : (19) (ii) Case II in which the object does not scramble in vP : (20). Crucially, given that the subject is externally-merged at [Spec, vP], the subject cannot scramble within vP (recall (13)).

(18) [vP S NQ_{subj} O V v]

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

- a. $\begin{array}{c} \downarrow \\ [{}_{vP} \text{ O } [{}_{vP} \text{ S } \text{ NQ}_{\text{subj}} \text{ t}_i \text{ V } v]] \\ \text{Linearize } vP: \text{ O} < \text{S} < \text{NQ}_{\text{subj}} < \text{V} < v \end{array}$
- b. $\begin{array}{c} \downarrow \\ [{}_{CP} \text{ O}_1 \text{ adv } [{}_{vP} \text{ t}_1 [{}_{vP} \text{ S } \text{ NQ}_{\text{subj}} \text{ t}_i \text{ V } v]] \text{ T C}] \end{array}$
- c. $\begin{array}{c} * [{}_{CP} \text{ S}_2 \text{ O}_1 \text{ adv } [{}_{vP} \text{ t}_1 [{}_{vP} \text{ t}_2 \text{ NQ}_{\text{subj}} \text{ t}_i \text{ V } v]] \text{ T C}] \\ \text{Linearize CP: S} < \text{O} < \text{adv} < vP \\ \Rightarrow \text{Ordering at CP: S} < \text{O} < \text{adv} < \text{NQ}_{\text{subj}} < \text{V} < v < \text{T} < \text{C} \end{array}$

As illustrated in (19a), if the object scrambles to the left of the subject, the object also scrambles to the left of NQ_{subj}, under the assumption that NP and NQ are base-generated as sisters.¹⁵ When the vP is spelled out, the linear ordering at vP given in (19a) is established ($\text{O} < \text{S} < \text{NQ}_{\text{subj}} < \text{V} < v$).

After the Spell-out of vP , the object may move further to the left of the high adverb, as in (19b). Suppose now that to create the word order in (17), the subject moves over the scrambled object, as described in (19c). When the CP in (19c) is spelled out, the ordering in (19c) is established in CP ($\text{S} < \text{O} < \text{adv} < \text{NQ}_{\text{subj}} < \text{V} < v < \text{T} < \text{C}$). Notice that the new ordering statements 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 and this derivation cannot be pronounced at PF.

Now turn to the other case where the object does not undergo scrambling within vP . This is illustrated in (20).

15. See Sportiche (1988), Kwashima (1998), and Kang (2002) for this assumption, and Dowty and Brodie (1984) for an alternative approach (see also fn. 17). Concerning the ordering between O and NQ_{subj}, the weaker assumption that NP and NQ are part of the same constituent in the underlying structure yields the same results as the assumption that NP and NQ are merged as sisters.

(20) *Case 2: the object does not scramble in vP*

- a. $[_{vP} S \quad NQ_{subj} \quad O \quad V \quad v]$
 Linearize vP: $S < NQ_{subj} < O < V < v$
- b. $*[_{CP} S_2 \quad O_1 \quad adv \quad [_{vP} t_2 \quad NQ_{subj} \quad t_1 \quad V \quad v] \quad T \quad C]^{16}$
 Linearize CP: $S < O < adv < vP < T < C$
 \Rightarrow Ordering at CP: $S < O < adv < NQ_{subj} < V < v < T < C$

When the vP is spelled out, the linear ordering in (20a) is established ($S < NQ_{subj} < O < V < v$). Note crucially that 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. Yielding the linear ordering in (17), the subject and the object undergo scrambling over the high adverb. When the CP is spelled out, the ordering statements in (20b) are established ($S < O < adv < NQ_{subj} < V < v < T < C$).

The new orderings added 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, due to the ordering contradiction, this derivation cannot be pronounced at PF.

In short, whether the object undergoes vP-scrambling (19) or not (20), the object cannot intervene between the subject and the NQ_{subj} due to Cyclic Linearization. If the object scrambles in vP, it must precede *both* the subject and the NQ_{subj} throughout. If the object does not scramble in vP, it must follow *both* the subject and the NQ_{subj} throughout.¹⁷

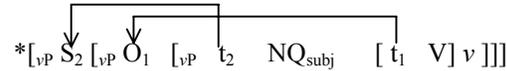
One of the crucial assumptions of this analysis is that the subject is directly merged at [Spec, vP], thus cannot vP-scramble. If the subject were able to scramble from the inner Spec to the outer Spec of v over the scrambled object within the vP, as in (21), the linear ordering in (17) would have been incorrectly allowed. Under my approach, (21) is ruled out by the general claim that scrambling is triggered by a c-commanding head: no scrambling is possible from [Spec, vP] to [Spec, vP]. (As will be seen in section 4, my analysis correctly predicts that a subject that is not externally-

16. Under F&P's framework, elements in the *non-edge* position of the Spell-out domain may move as long as the movement yields no ordering contradiction (cf. Chomsky's (1999) PIC). Thus, the fact that the object in VP moves from a *non-edge* position in (20b) is irrelevant in deciding the ungrammaticality of (20b).

17. Unlike (17), when NP and NQ are both Case-marked (Type (iib) NQ, fn.1), $S < O < NQ_{subj}$ is suddenly allowed. I argue that this is because a Case-marked NQ does not form a constituent with the host NP in the base structure: O moves to a position between S and NQ-Case before Spell-out of vP. See Ko (2004) for details.

merged in [Spec,vP] behaves differently.) Thus, to the extent that my analysis is successful, it provides evidence for the thesis that scrambling must be triggered by a c-commanding head.

(21) *Unavailable Case*: Scrambling from [Spec,vP] to [Spec,vP].



4. Further Support – Prediction for Asymmetries in Scrambling

In this section, I show that diverse restrictions in scrambling are in fact predicted under my proposal and receive a unified account.

First, I predict that *no overt element base-generated in vP may separate the subject and the NQ_{subj}*. This prediction is borne out, as shown in (22). Just like the object, the indirect object and PP argument cannot separate S and NQ_{subj}. Under my proposal, the analysis for (17) straightforwardly extends to the ungrammaticality of (22a,b).

- (22) a. ^{*/?}[S IO NQ_{subj} DO V]
^{*/?}**Haksayng-tul-i** Mary-ekey **sey-myeng** maykcwu-lul cwuessta
 Student-Pl-Nom M-Dat 3-Cl beer-Acc gave
 ‘Three students gave Mary beer.’
- b. ^{*/?}[S PP NQ_{subj} DO V]
^{*/?}**Haksayng-tul-i** kyosil-lo **sey-myeng** maykcwu-lul kacyevassta
 Student-Pl-Nom classroom-to 3-Cl beer-Acc brought
 ‘Three students brought beer to the classroom.’

Second, given that low adverbs are linearized within vP, I predict that *unlike high adverbs, low adverbs cannot separate the subject and NQ_{subj}*. This prediction is borne out as well:

- (23) ^{*/?}[S *L-adv* NQ_{subj} O V]
^{*/?}**Haksayng-tul-i** ilpwule **sey-myeng** kong-ul patassta
 Student-Pl-Nom deliberately 3-Cl ball-Acc received
 ‘Three students received the ball deliberately.’

The low adverbs patterning with (23) are typical vP (or VP) adverbs such as manner (e.g. *ppalli* ‘quickly’, *yelsimhi* ‘diligently’), instrumental (e.g. *poku-lo* ‘with a fork’) and resultative adverbs (e.g. *sansancokak-ulo* ‘into several pieces’). The high adverbs patterning with *way* ‘why’ in (4) includes sentential (e.g. *pwunmyenghi* ‘evidently’, *amato* ‘probably’), temporal (e.g. *ecey* ‘yesterday’), locative (e.g. *kekise* ‘there’) and evaluative

adverbs (e.g. *nollapkeyto* ‘to my surprise’). My account for (4) and (23) thus directly extends to this high/low adverb asymmetry in floating NQ constructions. My arguments also imply that we can use NQ constructions as a diagnostic to determine the syntactic position of adverbs.

Third, as observed by Miyagawa (1989) (originally for Japanese), *a passive/unaccusative subject may be separated from an NQ_{subj} by a PP, while unergative subject cannot.* (24). This asymmetry is in fact predicted under my analysis.

- (24) a. **Catongcha**-ga kangto-eykey **twu-tay** pwuswu-eci-ess-ta
 Car-Nom robber-Dat 2 -Cl break-Pass-Past-Dec
 ‘Two cars were broken by a robber.’[passive]
- b. ^{?(?)}**Haksayng-tul**-i ilpwule **twu-myeng** cenhwahayssta
 Student-Pl-Nom deliberately 2-Cl telephoned
 ‘Two students telephoned deliberately.’[unergative]

Given the assumption that the passive/unaccusative subject originates in VP (not in [Spec, vP]), I predict that the passive/unaccusative subject may move from VP to [Spec, vP] over the (low) PP *before* the Spell-out of vP, as described in (25) (cf. (21)). On the other hand, the unergative subject is base-generated in [Spec, vP], just like the subject in a transitive sentence. Hence, I also predict the ungrammaticality of (24b) and provide a unified account for (24b) and (23).¹⁸

- (25) $[_{vP} S_1 \quad PP \quad [_{vP} t_1 \quad NQ_{subj} \quad V] v]$
Linearize vP: S < PP < NQ_{subj} < V < v

5. Conclusion

I argued that scrambling is constrained by Cyclic Linearization at the PF-Syntax interface. I showed that a variety of restrictions and asymmetries in scrambling follow from this proposal: (i) the subject cannot strand an NQ_{subj} over a vP-internal element. (ii) the subject can strand an NQ_{subj} over a vP-external element. (iii) a passive/unaccusative subject, unlike the unergative subject, can strand an NQ_{subj} over a low PP. My arguments support the claim that scrambling is triggered by a c-commanding probe. My evidence further contributes to the thesis that the architecture of the grammar requires linearization in the phonology to be cyclically determined by the Spell-out of the syntax.

18. I also predict that the asymmetry in (24) will disappear when a high adverb is employed in the unergative paradigm. As discussed in Ko (2004), this is the case.

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