

Labeling and Moving Adjunction Structures*

Rhanghyeyun Kim

(Korea University)

Kim, Rhanghyeyun (2019). Labeling and moving adjunction structures. *The Linguistic Association of Korea Journal*, 27(3), 125–147. Chomsky’s (2013) labeling algorithm fails to label adjunction structures, resulting in the Full Interpretation problem. This paper shows that the algorithm faces another problem in ‘moving’ adjunction structures, based on the data from adverb–adjunction and scrambling. This paper then suggests that adverb–adjunction structures as well as scrambling structures can be labeled and thus are correctly predicted to be able to move if we adopt the Anti–Labeling Device of Saito (2016). Finally, Feature–based Labeling alternatives to the Anti–Labeling Device are critically discussed.

Key words: labeling, adverb, scrambling, adjunction, Anti–Labeling Device, Feature.

1. Introduction

1.1. Chomsky’s (2013) Labeling Algorithm

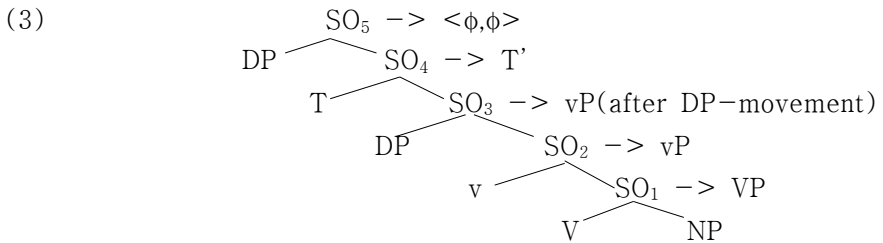
Chomsky (2013) lays out a theory of how structures are built in narrow syntax. One of the important Minimalist assumptions in Chomsky (2013) is that Merge applies freely. That is, Merge, by hypothesis, is not “driven” by any convergence condition, as previously assumed in early Minimalism, but simply available to apply, optionally and freely.

* I would like to thank three anonymous reviewers for their valuable comments and suggestions. This research is supported by Korea University’s 2018 College of Global Business Research Fund.

Under this simple conception of Merge, Chomsky (2013) argues that Merge(α , β) yields $\{\alpha, \beta\}$ with no label projection. “Labeling” through minimal search MS as in (1) and (2) will then help us to find what kind of a syntactic object SO $\{\alpha, \beta\}$ is.

- (1) Suppose $SO = \{H, XP\}$, H a head and XP not a head. Then, MS selects H as the label (Chomsky 2013, p. 43).
- (2) Suppose $SO = \{XP, YP\}$, neither a head. There are two ways in which SO can be labeled: (A) modify SO so that there is only one visible head (e.g. through movement of either XP or YP), or (B) X and Y share some prominent features, which can be taken as the label of $\{XP, YP\}$. (adapted from Chomsky 2013, p. 43).

Consider (3) to see how Labeling Algorithm LA in (1) and (2) works.



$SO_1 \{V, NP\}$ and $SO_2 \{v, VP\}$ will be labeled as VP and vP, respectively, since Head projects. Now, $SO_3 \{DP, vP\}$, as it is, cannot be labeled since neither is a head. However, SO_3 may receive a label ‘vP’ at a later point after DP moves to a higher position in accordance with (2A): MS after the movement “sees” only vP when it “looks at” $SO_3 \{DP, vP\}$ since traces, being part of a chain, are ignored for the purpose of labeling; SO should dominate every occurrence of its component to be labeled. $SO_4 \{T, vP\}$ will be labeled as T’ according to (1). Finally, $SO_5 \{DP, TP\}$ will be labeled as $\langle \phi, \phi \rangle$ in accordance with (2B): the ϕ -features are shared by DP and TP and thus become the label of SO_5 .

1.2. Full Interpretation and Adjunction

Chomsky (2013) allows unlabeled objects, but only “during the derivation” as in the case of SO_3 as we saw above. In the final representations, they are not allowed since labels are required for interpretation at the conceptual–intentional interface CI. If the object lacking the label appears at CI, it violates Full Interpretation FI.

Now, among the constructed structures are cases where neither movement option (LA 2A) nor feature–sharing option (LA 2B) seems to be available for labeling; adjunction structures. Chomsky (2013) is not clear about how adjunction structures are labeled. Adjunction structures are then potential problems of LA, as they are not labeled and thus violate FI.

This article deals with two sorts of adjunction structures among others: the one created by adverb attachment and the one created by scrambling. I will argue that the Anti–Labeling Device (Saito, 2016; cf. Miyagawa et al, 2018) applies not only to scrambling but also to adverb–adjunction. The feature–based alternative along the line of Miyagawa (2010, 2017) will also be critically discussed.

2. Adverb Adjunction Structures

2.1 Labeling?

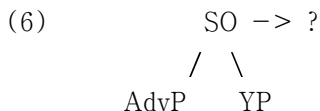
Adverbs seems to enjoy a free distribution within a sentence as in (4–5) but it is not that their distribution is totally free from all constraints. There are various approaches to licensing of adverbs and none of the approaches are without problems in capturing the apparent free but restricted distribution of adverbs.^{1),2)}

1) There are basically four types of adverb–licensing approaches: adverbs as heads (Travis, 1984)), adverbs as specs (Laenzlinger, 1993; Rijkhoek, 1994; Alexiadou, 1997; Cinque, 1995, 1999), adverbs as complements (McConnel–Ginet, 1982; Larson, 1988, 1990; Stroik, 1990), and adverbs as adjuncts (Chomsky, 1986, 1995, 1998, 1999; Zubizarreta, 1982, 1987; Sportiche, 1988, 1994).

- (4) a. *Probably* George has read the book.
 b. George *probably* has read the book.
 c. George has *probably* read the book.
- (5) a. *Cleverly*, John has been answering their questions.
 b. John *cleverly* has been answering their questions.
 c. John has *cleverly* been answering their questions.

Still, the most general assumption on (especially, pre-verbal) adverbs is that they are adjuncts, i.e., elements that are not lexically selected by a predicate and do not obligatorily appear in a sentence (Chomsky, 1986, 1995, 1998, 1999; Zubizarreta, 1982, 1987; Sportiche, 1988, 1994, etc.)³⁾

Now, if the general assumption is on the right track, then the formed adjunction structures by adverb-attachment as in (6) will be problems to LA since they are not able to be labeled as neither movement option nor feature-sharing option is available.



2.2 No Labeling Approach

One might argue that adjunction structures do not have to be labeled at all. In fact, Yoo (2018) and Park and Yoo (2019), essentially following Hornstein and Nunes (2008), Hunter (2010), and Bošković (2018), argue that adjunction structures can, or more correctly, must remain label-less for syntactic licensing.⁴⁾

2) The adjunct approach to adverbs, for example, would need an independent scope principle to capture the relative sequencing effect noted by Cinque (1995, 1999).

3) Our discussion is limited to pre-verbal adverbs. Postverbal adverbs are analysed as complements (McConnel-Ginet, 1982; Larson, 1988, 1990; Stroik, 1990). SOs with postverbal adverbs are not problems to LA since they can be labeled in accord with LA (1).

4) Yoo (2018) discusses modifier-adjunction structures, i.e., <AP, NP> cases. He argues

The key idea is that both elements of adjunction structures contribute equally to the interpretation and thus they should contribute equally to labeling as well; therefore, it is not possible for only one element to project and thus the formed object cannot help but remain label-less unless there is a feature-sharing between the two elements. The violation of FI can be avoided, Yoo (2018) proposes, since the adjunct employs predicate modification to “get labeled at the interpretive component” through the conjunctive labeling device.

The proposal is quite appealing. However, No Labeling (at syntax) Approach will face a problem if there is any “syntactic” operation that targets adjunction structures. The fact is that adverb-adjunction structures as well as scrambling adjunction structures ARE targeted by syntactic operation such as movement, as we will see in the next sections.

2.3 VP-fronting with Adverbs

Bošković (2018, p. 262) argues that unlabeled elements cannot undergo movement on the assumption that unlabeled elements are not phases and that only phases can undergo movement (Chomsky, 1998, 1999).⁵⁾

Now, if Bošković’s (2018) argument is on the right track, adverb-adjunction structures are predicted not to be able to move since they are not labeled, given the general assumption that adjuncts do not share “features” with merged phrases.⁶⁾ However, the VP-fronting data in (7–8)

that AP cannot move out of non-feature sharing adjunction structures since the movement results in labeling of <AP, NP> as NP, which is in conflict with his proposal that both elements in adjunction should contribute equally to labeling.

5) Bošković (2018) argues that the traditional ban on movement out of moved elements is not right and should be replaced by his ban on movement of phases with non-agreeing specifiers. The gist of his argument is that non-agreeing specifiers make phases unlabeled and thus the phases cannot move; any movement out of a phase must first move to its edge, given the Phase-Impenetrability Condition. This edge movement, given the cycle, needs to happen before the phase moves. Now, this edge movement yields an unlabeled element since there is no feature-sharing between these two elements. Given that only phases can undergo movement (Chomsky, 1998, 1999), the element formed by this edge movement is not allowed to move, since unlabeled objects cannot be phases.

6) See Section 5 for the possible feature-based analysis.

indicate that adjunction structures formed by adverb–attachment do move.^{7),8), 9)}

- (7) a. Critically examined every folio a scholar has.
b. Willingly examined every folio a scholar has.
(Ott 2018, p. 262; Moon 2018, p. 237)

- (8) a. Cleverly answer the questions, John will.
(meaning: the way John will answer the questions will be clever.)
b. Quickly arrested by the police, John will be.
(meaning: the manner of arresting will be quick.)
c. Completely read the book, George will.
(p.c. Conrad Brubacher; Michael Berrie)

The natural question is then how VPs with adverbs can be targets of fronting operation even though they are not labeled?¹⁰⁾ How can we account

7) Hornstein and Nunes (2008, p. 60) also present the data in (i) as cases of VP–preposing with (any number of) adjuncts. As I noted in Footnote 3, the discussion of this paper is limited to pre–verbal adverbs.

- (i) a. John could [eat the cake] and [eat the cake] he did.
b. John could [[eat the cake] [in the yard]] and [eat the cake] he did [in the yard].
c. ... and [[eat the cake] [in the yard]] he did [with a fork].
d. ... and [[[eat the cake] [in the yard]] [with a fork]] he did.

8) As Moon (2018) notes, the possibility of English VP–preposing with adverbs depends on the properties of adverbs, which is in need of more research in future. The sentences in (8) contain Class I, II, and IV adverbs of Jackendoff(1972) with manner interpretation, which are usually considered as VP–adverbs. The judgement on the data are from my informants (Conrad Brubacher at Korea University and Michael Berrie at Sogang University).

9) Some linguists like Ott (2018) argue that VP–fronting is in fact VP–dislocation. Refer to Moon (2018) for the advantages and the disadvantages of the dislocation analysis.

10) An anonymous reviewer points out that a labeling problem does not arise if pre–verbal adverbs are attached to V and ‘move’ targets vP, given Huang(1993). I

for the fact that the unlabeled syntactic object SOs (VPs with adjuncts) behave in the same way as the labeled SOs (VPs without adjuncts) with respect to syntactic operations like movement? It seems that we would need some mechanism to explain the movement of the unlabeled VPs.

So far, we have seen that labeling and moving of VPs with adverbs brings up a potential problem to Chomsky's (2013) labeling algorithm LA. In the next section, I will show that labeling and moving of scrambled phrases pose the same sort of problem to LA.

3. Adjunction Structures by Scrambling

3.1 Labeling?

One of the widely accepted views on scrambling since Saito (1985) is that it is an optional adjunction operation.¹¹⁾ Further, it is supposed to be "pure merge" without feature sharing, given Saito's (1989, 1992, 2003) argument that scrambling is neither operator movement nor A-movement (see also Hoji, 1985; Kuroda, 1988; Webelhuth, 1989; Abe, 1993; Fukui, 1993; Tada, 1993; Cho, 1994; Saito & Fukui, 1998; Takano, 1998; Kitahara, 2000). Now, one would

suspect that pre-verbal adverbs are attached to *v* rather than *V* for the following two reasons. First, we don't have any empirical evidence that pre-verbal adverbs are attached to *V*. Secondly, since adverbs 'selected' by verb are included within *V* (McConnel-Ginet, 1982; Larson, 1988, 1990; Stroik, 1990), it is conceptually more reasonable to include adverbs 'unselected' by *V* within *v* rather than *V*.

11) The other two views on scrambling are the Base-Generation Approach and the Feature-Driven Movement Approach. The former (Bošković & Takahashi, 1998; Cho and Kim, 2000; Fanselow 2001) argues that scrambled phrases are directly base-generated in the surface positions and undergo obligatory LF lowering for θ -feature checking. One of the alleged advantages of this approach is that in this approach scrambling is consistent with Last Resort. Readers can refer to Bailyn (2001) and Johnston and Park (2001) for various theoretical and empirical arguments against the obligatory LF lowering account. The feature-based approach claims that word order variation is derived not by optional movement but by obligatory movement for features such as focus/topic-features, case/agreement-features, EPP-features, edge-features, etc. See Section 5 for more discussion.

expect that the SO formed by scrambling as in (9) cannot be labeled since none of the LA in (1–2) is available.

- (9) SO → ?
 / \
 scrambled XP YP

3.2 No Labeling Approach

Again, Park and Yoo (2019) argue that the SO in (8) need not to be labeled since it will undergo reconstruction to its original launching site “at the interpretive component” and get labeled there, satisfying FI. This is what happened in the so called radical reconstruction construction sentences as in (10) and (11).

- (10) etten chayk-ul₁ Yuna-nun [Jina-ka t₁ pilleyss-nunci] kungkumhay hayessta
 which book-acc. Y.-top. J.-nom. borrow-Q wanted-to-know
 'Which book₁, Y. wanted to know [Q [J. borrowed t₁]].'
 (11) caki-casin₁-ul Yuna-ka [_{IP} Jina₁-ka t₁ miwehanta-ko] mitnunta
 self-acc. Y.-nom. J. -nom. hate-that believes
 'Self₁, Y. believes that J.₁ hates t₁.'

Or alternatively, if it is not undone, it takes the option of semantic predication at the interpretive component. Violations of FI are thus avoided.

Putting aside the problem of FI violations at the interpretive component, however, No Labeling Approach at syntax faces problems here just as it does in the case of adverb–adjunction structures, since the SO formed by scrambling can be processed by “syntactic” operations like movement as we will see in the next section.

3.3 Scrambling of Scrambled Phrases

Given Bošković’s (2018, p. 262) argument that unlabeled elements cannot undergo movement, the adjunction structures formed by scrambling are predicted not to be able to move. However, the fact is that the SO formed

by scrambling can scramble further as shown in (12c),¹²⁾

(12) a. emeni-kkeyse [Yuna-ka sayntuwichi-lul mantulessta-ko] malssumhasyesse
 Mother-Nom(hon.) Y.-nom. sandwich-acc. made-Comp. said
 'Mother said that Y. made sandwiches.'

b. emeni-kkeyse [_? **sayntuwichi-lul₁** [Yuna-ka t₁ mantulessta-ko]] malssumhasyesse

c. [_? **sayntuwichi-lul₁** [**Yuna-ka t₁ mantulessta-ko**]]₂ emeni-kkeyse t₂ massumhasyesse

The data in (13) and (14) show that not only NPs but also locative/time/manner adverbs can scramble to the edge of a phrase (the embedded clauses in (13–14)) and the formed SOs by these scramblings can scramble

12) One might think that (12) does not raise a labeling problem if we take Miyagawa's (1997, 2001) argument that object scrambling is movement into spec of IP. However, there are plenty of data that support the argument that scrambling is pure adjunction operation (Saito 1989, 1992, 2003), which this paper takes. Further, Miyagawa's (1997, 2001) approach has a burden to assume that adverbs and/or post-positional phrases sit in the spec of IP (sharing some-features) to explain the data in (13)–(14).

One might also think that (12c) does not raise a movement problem since all the scrambled phrases are attached to IP and the movement in (12c) targets CP. However, the sentence (ic), where an NP is scrambled over a topic subject (and thus probably adjoined to CP) and the whole scrambled phrase is scrambled again, indicates that scrambling of a scrambled phrase IS a real problem to Chomsky's LA; in fact, there could be more cases like this, where a phrase is scrambled over a phrase, say a CP adverb, in the spec of CP, which need to be researched further in the future.

- (i) a. Kyoswunim-kkeyse [Yuna-nun cakicasinuy puroceyktu-lul acwu yelsimhi
 Professor-Nom(hon.) Y.-Top. her own project-acc. very enthusiastically
 swuhaynghaysstako] malssumhasyesse
 carried-out said
 'Professor said that Y carried out her own project very enthusiastically.'
- b. Kyoswunim-kkeyse [_? **cakicasinuy puroceyktu-lul₁** [Yuna-nun t₁ acwu
 yelsimhi swuhaynghaysstako] malssumhasyesse
- c. [_?**cakicasinuy puroceyktu-lul₁** [**Yuna-nun t₁ acwu yelsimhi swuhaynghaysstako**]]₂
 Kyoswunim-kkeyse t₂ malssumhasyesse

further.

- (13) a. Kyoswunim—kkeyse [Yuna—ka ece i kanguysil—eyse ku puroceyktu—lul
 Professor—Nom(hon.) Y.—nom. yesterday this classroom—in the project—acc.
 swuhaynghaysstako] malssumhasyesse
 carried—out said
 ‘Professor said that Y carried out the project in this room yesterday.’
- b. Kyoswunim—kkeyse [_? i kanguysil—eyse₃ [_? ece₂ [_? ku puroceyktu—lul₁ [
 Yuna—ka t₃ t₂ t₁ swuhaynghaysstako]] malssumhasyesse
- c. [_? i kanguysil—eyse₃ [_? ece₂ [_? ku puroceyktu—lul₁ [Yuna—ka t₃ t₂ t₁
 swuhaynghaysstako]]]₄ Kyoswunim—kkeyse t₄ malssumhasyesse
- (14) a. Kyoswunim—kkeyse [Yuna—ka acwu yelsimhi ku puroceyktu—lul
 Professor—Nom(hon.) Y.—nom. very enthusiastically the project—acc.
 swuhaynghaysstako] malssumhasyesse
 carried—out said
 ‘Professor said that Y carried out the project very enthusiastically.’
- b. Kyoswunim—kkeyse [_? acwu yelsimhi₃ [_? ku puroceyktu—lul₁ [Yuna—ka t₂ t₁
 swuhaynghaysstako] malssumhasyesse
- c. [_? acwu yelsimhi₃ [_? ku puroceyktu—lul₁ [Yuna—ka t₂ t₁ swuhaynghaysstako]]₃
 Kyoswunim—kkeyse t₃ malssumhasyesse

Now, scrambling of scrambled elements as in (12–14) targets unlabeled SOs and thus should not be able to occur from the start. The possibility of scrambling of scrambling as well as VP-fronting with adverbs then indicates that we would need some mechanism to label at least these two types of adjunction structures.

4. Labeling by Anti-Labeling Device

In this section we will look over the Anti-Labeling Device of Saito (2016). Then I propose to extend the mechanism to adverb-adjunction structures.

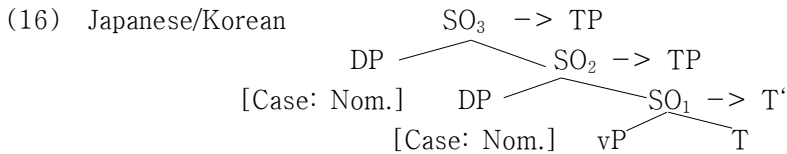
4.1 Anti-Labeling Device for Scrambling¹³⁾

13) Also refer to Miyagawa et al (2018), who, developing Saito (2016), argue that there are two ways to mark which of a given pair { α , β } may project; to render one member

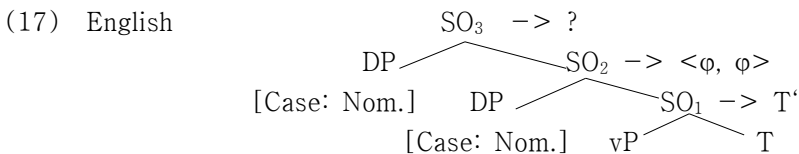
Saito (2016) proposes that Case marker in Japanese serves as an anti-labeling device that makes a constituent invisible for labeling. This proposal is based on the idea that morphological case makes a phrase opaque for minimal search MS. When MS searches for a label in (15), the morphological case marker makes α P opaque and consequently, β P (or its head) serves as the unique label provider for γ .

$$(15) \gamma = \{\alpha P\text{-Case}, \beta P\}$$

He argues that this proposal is desirable in two respects. First of all, it explains why multiple Case marking is possible in Japanese/Korean but not in English; Consider (16). SO_1 is labeled as T' since a head projects. Crucially SO_2 and SO_3 can be labeled as TP in Japanese/Korean since DP with suffixal case in these languages never provides the label for a larger constituent.



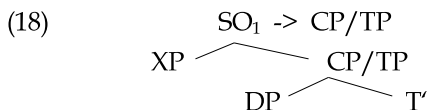
On the other hand, multiple Case marking is not possible in English due to the lack of the Anti-Labeling Device. Consider (17). While SO_2 can be labeled as $\langle \varphi, \varphi \rangle$ through feature sharing, SO_3 cannot be since neither feature-sharing nor the Anti-Labeling Device is available.



Saito (2016) argues, the second consequence of the Anti-Labeling Device is that it provides an explanation for scrambling. Suppose that XP targets

as inert for projecting, or to render it as active for projecting. They call the former projection blocker (PB), and the latter projection licenser (PL).

CP/TP as in (18). SO_1 cannot be labeled by feature sharing but it can be by the Anti-Labeling Device; XP never projects and thus SO_1 is labeled as CP/TP.



The process in (18) is not available in English and thus English does not have scrambling.

4.2 Revisiting Scrambling of Scrambled Phrases

Given the Anti-Labeling Device, Scrambling of Scrambled Phrases is now trivially captured. The SO formed by scrambling is now able to be labeled as CP or TP (depending on whether scrambling targets CP or TP) as in (12b)' and thus is correctly predicted to be able to scramble further as in (12c)'.

- (12) a. emeni-kkeyse [Yuna-ka sayntuwichi-lul mantulessta-ko] malssumhasyesse
 Mother-Nom(hon.) Y.-nom. sandwich-acc. made-Comp. said
 'Mother said that Y. made sandwiches.'
- b. emeni-kkeyse [_{CP/TP} sayntuwichi-lul₁ [Y.-ka t₁ mantulessta-ko]]
 malssumhasyesse
- c. [_{CP/TP} sayntuwichi-lul₁ [Y.-ka t₁ mantulesstako]]₂ emeni-kkeyse t₂
 massumhasyesse

4.3 Anti-Labeling Device for Adverb-Adjunction

Now, turning to adverb-adjunction structures, I would like to suggest that adverbial suffix (covert or overt) serves as an anti-labeling device as well, extending Satio's (2016) analysis.^{14), 15)}

14) Saito(2106) assumes the feature λ which makes a constituent opaque for search. He claims that this feature is realized as Case markers on DPs/PPs and as inflection on predicates. The λ -feature on predicate, for example, is valued as 'preverbal' by v/V in (i) (and the λ -feature will be valued as 'conclusive' by C and 'prenominal'

(19) Anti-Labeling Device for Adverb-Adjunction

Adverbial suffix (covert or overt) serves as an anti-labeling device.

This is quite plausible given the argument by Larson (1987, pp. 250–252) that adverbial affixes are some kind of case markers (see also Dechaine, 1993, p. 54).

“So just as combination of NP with a preposition produces an "adverbial" of category PP, combination of an AP with the formative *-ly* produces an adverb of category AdvP... The function of the *-ly* morpheme is fundamentally a Case-marking element that allows a Case-dependent category (AP) to appear in an adjunct site (Larson 1987, pp. 250–251).”

Alexiadou (1997) adds that in West Greenlandic Eskimo, the adverbial endings *-tigut*, *-kkut* and *-mik* are Case markers. Also note that Emonds (1985, p. 58) claims that the adverbial suffix *-ly* is a sort of inflectional affix on the adjective and Alexiadou (1997) argues that the *-ly* ending is an indication of agreement between the adverbs and the verbs and this agreement is very different from the one between DPs and the functional verbal heads.

Now, by putting together adverbs and scrambled phrases on the same line

by D/N).

(i) Taroo-wa sizuka-**ni** kaet-ta (**preverbal**)

T.-TOP quietness-Cop. leave-Past

‘Taroo left quietly’

The insight of this proposal is that there is a parallelism between predicate inflection and Case (see also An 2009). What is relevant to our discussion is that pre-verbal inflection, i.e., adverbial suffix, can also function as an anti-labeling device, which I extend to English adverb-adjunction based on the arguments by Emonds (1985), Larson (1987), and Alexiadou (1997) as stated in the text.

- 15) An anonymous reviewer asks about labeling of adverb-scrambling, which this paper did not handle. I suspect that adverbs in Korean, as anti-labelers, can scramble freely up to various constraints on adverb-licensing such as scope principle (see Footnote 16).

in labeling process, we can capture the similarity between them with respect to multiple stacking; scrambling can apply multiply (theoretically indefinitely if not restricted by other constraints), possibly because scrambled phrases never project and thus scrambling is free from the burden of labeling. Likewise, adverb phrases may attach multiply (if not constrained by other constraints), possibly because they never project, being free from the labeling burden.¹⁶⁾

4.5 Revisiting VP-fronting with Adverbs

Now, given the Anti-Labeling Device for adverb-adjunction, labeling and moving adverb-adjunction structures will be trivially captured as in the case of scrambling above. The formed adjunction structures in (6) will now be able to be labeled as YP as in (6') since AdvP never projects.

$$(6') \quad \begin{array}{ccc} & \text{SO} & \rightarrow \text{YP} \\ & / \quad \backslash & \\ \text{AdvP} & & \text{YP} \end{array}$$

In the same vein, the verb phrase with adverbs in (7), being able to be labeled as VP, will not have a problem in being processed by syntactic operation like fronting as in (7').

- (7') a. [_{VP} Critically examined every folio] a scholar has.
 b. [_{VP} Willingly examined every folio] a scholar has.

In this section we have looked over Saito's (2016) Anti-Labeling Device as one way to explain adjunction structures by scrambling and I suggested to extend the Anti-Labeling Device to adjunction structures by adverb-attachment. In the next section, we will look over Feature-Based alternatives and see that we need the Anti-Labeling Device anyway to capture the properties of scrambling.

16) There will be more similarities between adverbs and scrambled phrases and there will be differences between them as well, which might be captured by various proposals and constraints on them, the study of which is beyond the scope of this paper.

5. Discussion on Alternatives

5.1 Feature-Driven Scrambling

While linguists like Saito (1985, 1989, 1992, 2003) claim scrambling is a truly optional operation, occurring without any driving force, others argue that scrambling is a feature-driven movement (e.g. Y. Lee 1993, Miyagawa 1997, 2001, 2003, 2006, 2010, 2017, Karimi 1999, Kitahara 2000, Ishihara 2001, Lee and Cho 2003, Jung 2002, Yang and Kim 2005, H. Lee 2006, Ko 2007, 2011, 2014, 2017). Various formal features such as focus/topic-features, δ -features, case/agreement-features, EPP-features, edge-features, etc. have been proposed.

Specifically, Miyagawa (2010, 2017) argues that (1) all languages have Agree, which is a means of forming ‘functional relation’ such as subject-predicate, theme-rheme, and focus-presupposition, (2) Agree is typically accompanied by movement, (3) Agree is not always a matter of ϕ -feature valuation; another form of Agree employs discourse configurational features (δ -features) such as topic/focus, (4) Japanese is a discourse-configurational language and thus δ -features play the role that ϕ -feature agreement plays in agreement languages. Scrambling (as well as A-movement) in Miyagawa’s (2010, 2017) point is therefore driven by δ -features such as topic/focus.

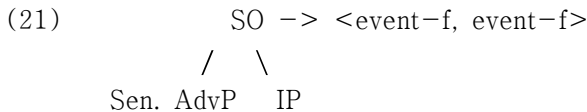
5.2 Labeling Adjunction Positions with Features

Along this line of approach, one could say that adjunction structures formed by scrambling can be labeled as $\langle \delta, \delta \rangle$ through feature-sharing as in (20).

$$(20) \quad \begin{array}{ccc} & \text{SO} & \rightarrow \langle \delta, \delta \rangle \\ & / \quad \backslash & \\ \text{XP} & & \text{YP} \end{array}$$

We could extend this sort of approach to adverb-adjunction, and say that adverb-adjunction structures are also labeled through feature-sharing; this is not totally improbable given Travis’s (1988) proposal that adverbs are licensed by the

designated feature of a head; epistemic¹⁷⁾ or sentential adverbs are licensed by the event feature of I and manner adverbs are licensed by the manner feature of V. So for example, we can say that the adjunction structures in (21), where sentential adverbs are adjoined to IP, are labeled as <event-f, event-f>. Or one could invent some fancy features.



Although this line of approach is possible, feature-driven analysis of scrambling will face a difficulty in accounting for the fact that scrambling does not show the intervention effect as illustrated in the following section.

5.3 Scrambling and the Intervention Effect

If it is really true that scrambling is driven by features, for example, δ -features such as topic/focus as Miyagawa (2010, 2017) argues, we would expect that it obeys the same sort of movement constraints that the usual Topic/Focus movement obeys. However, the fact is contrary to this expectation. Scrambling is observed not to be subject to the intervention effect as shown in (22–23), while Topicalization is subject to the effect as shown in (24–25) (Bošković and Takahashi 1998, p. 359).

(22) scrambling out of wh-Island

ku chayk-ul₁ John-i [Mary-ka t₁ ilkess-nunci] kungkumhayhanta
 that book-acc. J.-nom. M.-nom. read-whether want to know
 'That book, John want to know [whether Mary read].'

(23) scrambling over a scrambled phrase

Yuna-eykey₂ ku chayk-ul₁ John-i [Mary-ka t₂ t₁ cwuesstako] malhayssta
 Y.-to that book-acc. J.-nom. M.-nom. gave said
 'To Y., that book, John said that Mary gave.'

17) Epistemic adverbs express the speaker's degree of confidence about the truth of the proposition such as *probably*, *likely*, *presumably*, *supposedly*.

(24) topicalization out of *wh*-Island

?*John₁, you wonder whether Mary kissed t₁.

(25) topicalization over a topicalized phrase

?*To John₂, that book₁, (Bill said that) Mary handed t₁ t₂.

Then, to capture the contrast between (22–23) on the one hand and (24–25) on the other hand, any feature-driven movement analysis of scrambling need to assume that only scrambling-related features are exempt to the intervention effect, which is quite dubious.

5.4 Back to the Anti-Labeling Device

To capture the fact that scrambling evades the intervention effect as in (22–23), one could dissociate features from movement, slightly departing from Miyagawa (2010, 2017). That is, we can say that scrambling is a truly optional operation without any driving force, but the scrambled phrase somehow “happens” to share δ -features with the target phrase after scrambling and thus the resulting SO is labeled as $\langle\delta,\delta\rangle$.

Now, suppose that this happening is obligatory (for labeling). One might wonder what would be the conceptual ground for the assumption that a truly optional movement obligatorily participates in feature-sharing.

On the other hand, suppose that this happening is optional, which seems to be necessary if it is true that scrambling shows the radical reconstruction effect as introduced in (10–11) above, while English topicalization does not as shown in (26), where *what* cannot have any interpretation in (b), while it can marginally have the matrix scope in (a).¹⁸⁾ (28) is another case of the radical reconstruction.¹⁹⁾

18) As for the mechanism of radical reconstruction under the current approach, I suspect that any phrase which did not participate in labeling deletes at the interpretation component unless the phrase position is independently required, say, for predication, thematic relation, etc.

19) Refer to H. Lee (2006) for the argument that all scrambled phrases bear focus effect and thus there is no real reconstruction effect in Korean. See also Cho (1996) for the case, which H. Lee (2006) counts as another anti-reconstruction case in Korean.

- (10) etten chayk-ul₁ Yuna-nun [Jina-ka t₁ pilleyss-nunci] kungkumhay hayessta
 which book-acc. Y.-top. J.-nom. borrow-Q wanted-to-know
 'Which book₁, Y. wanted to know [Q [J. borrowed t₁]].'
- (11) caki-casin₁-ul Yuna-ka [_{IP} Jina₁-ka t₁ miwoehanta-ko] mitnunta
 self-acc. Y.-nom. J. -nom. hate-that believes
 'Self₁, Y. believes that J.₁ hates t₁.'
- (26) a. ??Who₁ t₁ said that [the man that bought what]₂, John knows whether
 Mary likes t₂?
 b. *Mary thinks that [the man that bought what]₂, John knows who₁ t₁
 likes t₂. (Saito, 1992, p. 81)
- (27) *amwuto [_{IP} John-i chayk-ul ani sassta-ko] mitnunta
 anything J. -nom. book-acc. not bought-that believes
 '*Anybody believes that John did not buy the book.'
- (28) amwukesto₁ Mary-ka [_{IP} John-i t₁ ani sassta-ko] mitnunta
 anything M.-nom. J. -nom. not bought-that believes
 'Anything₁, Mary believes that John did not buy t₁.'

Now, once we assume that the feature-sharing happening is optional, it seems that we need an independent labeling device for non-feature sharing cases, even if feature-sharing positions can be labeled by features.

In short, under the feature-based alternatives, to explain the contrast between scrambling in Korean/ Japanese and Topicalization in English with respect to the intervention effect and the radical reconstruction effect, we will lead to a situation where we need a labeling device such as the Anti-Labeling Device anyway.

6. Summary and Conclusion

Chomsky (2013) lays out a theory of how structures are built in narrow syntax, in particular, how each structure gets its labeling. His labeling algorithm, however, is not clear about how adjunction structures are labeled. Putting aside the problems of Full Interpretation violations, a natural question is then how “syntactic” operations like movement can target the unlabeled adjunction structures such as adverb-adjunction structures and scrambling-adjunction structures.

We looked over Saito's (2016) Anti-Labeling Device for scrambling and I suggested to extend the device to adverb-adjunction. The feature-based labeling alternative was discussed and I concluded that we need a separate labeling device such as the Anti-Labeling Device anyway, even under this line approach, to capture the properties of scrambling distinguished from feature-driven movement in English such as Topicalization.

References

- Abe, J. (1993). *Binding conditions and scrambling without A/A' distinction*, Unpublished doctoral dissertation, UCONN, Storrs, CT.
- Alexiadou, A. (1997). *Adverb placement*. John Benjamins Publishing Company.
- An, D. H. (2009). A Note on Genitive Drop in Korean. *Nanzan Linguistics* 5, 1–16.
- Bošković, Ž. (2018). On movement out of moved elements, labels and phases. *Linguistic Inquiry*, 49, 247–282.
- Bošković, Ž., & Takahashi, D. (1998). Scrambling and last resort. *Linguistic Inquiry*, 29, 347–366.
- Cho, J-H. (1994). *Scrambling in Korean: Crossover, reconstruction and binding theory*. Unpublished Doctoral dissertation, UCONN, Storrs, CT.
- Cho, J-H. (1996). Reconstruction effects and intermediate A-position. *Studies in Generative Grammar*, 6, 257–279.
- Cho, J-H., & Kim, D-H. (2000). Scrambling without syntactic movement. *Studies in Generative Grammar*, 10, 151–179.
- Chomsky, N. (1977). On wh-movement. In P. Culicover (Ed.), *Formal syntax* (pp. 71–132). New York: Academic.
- Chomsky, N. (1986). *Barriers*. Cambridge, MA: MIT Press.
- Chomsky, N. (1995). *The Minimalist Program*. Cambridge, MA: MIT Press.
- Chomsky, N. (1998). Minimalist inquiries: the framework. *MIT Occasional Papers in Linguistics* 15.

- Chomsky, Noam. 1999. Derivation by Phase. *MIT Occasional Papers in Linguistics 18*. [In Michael Kenstowicz, (Ed.), 2001, *Ken Hale. A Life in Language* (pp. 1–52). Cambridge, Mass.: MIT Press.
- Chomsky, N. (2013). Problems of projection. *Lingua*, 130, 33–49.
- Chomsky, N. (2015). Problems of projection: Extensions. In E. D. Domenico, C. Hamann, & S. Matteini (Eds.), *Structures, strategies and beyond: Studies in honour of Adriana Belletti* (pp. 3–16). Amsterdam: John Benjamins.
- Cinque, G. (1999). *Adverbs and functional heads*. Oxford University Press.
- Déchaine, R–M. (1993). *Predicates across categories*. Ph.D. Dissertation. University of Massachusettes, Amherst.
- Emonds, J. (1985). *A unified theory of syntactic categories*. Dordrecht: Foris.
- Epstein, S., Kitahara, H., & Seely, T. D. (2014). Labeling by minimal search: Implications for successive cyclic A–movement and the conception of the postulate “Phase.” *Linguistic Inquiry*, 45, 463–481.
- Ernst, T. (2002). *The syntax of adjuncts*. Cambridge: Cambridge University Press.
- Fanselow, G. (2001). Features, θ –roles, and free constituent order. *Linguistic Inquiry*, 32, 405–437.
- Fukui, N. (1993). Parameters and optionality. *Linguistic Inquiry*, 24, 399–420.
- Heycock, C. (1992). Layers of predication and the syntax of the copula. *Belgian Journal of Linguistics*, 7, 95–123.
- Hoji, H. (1985). *Logical form constraints and configurational structures in Japanese*. Doctoral dissertation, University of Washington, Seattle.
- Hornstein, N, and J. Nunes. (2008). Adjunction, labeling, and bare phrase structure. *Biolinguistics*, 2, 57–86.
- Hunter, T. (2010). *Relating movement and adjunction in syntax and semantics*. Unpublished PhD thesis, University of Maryland.
- Ishihara, S. (2001). Stress, focus and scrambling in Japanese. *MITWPL 39: A Few From Building E39*. Cambridge, MA: MITWPL.
- Jackendoff, R. (1972). *Semantic interpretation in generative grammar*. Cambridge, MA: MIT Press.

- Jung, Y-J. (2002). Scrambling, edge effects and A/A'-distinction. *The Linguistic Association of Korea Journal*, 10, 41-64.
- Johnston, J. C., & Park, I-S. (2001). Some problems with a lowering account of scrambling. *Linguistic Inquiry*, 32, 727-732
- Karimi, S. (1999). Is scrambling as strange as we think it is? In K. Arregi, B. Bruening, C. Krause, & V. Lin (Eds.), *MIT Working Papers in Linguistics 33, Papers on morphology and syntax, cycle one* (pp. 159-190). Cambridge, MA: MITWPL
- Kitahara, H., (2000). Case and scrambling: A derivational view. Unpublished manuscript, Keio University.
- Ko, H-J. (2007). Asymmetries in scrambling and cyclic linearization. *Linguistic Inquiry*, 38, 49-83.
- Ko, H-J. (2011). Predication and edge effects. *Natural Language and Linguistic Theory* 29, 725-778.
- Ko, H-J. (2014). *Edges in syntax: Scrambling and cyclic linearization*. Oxford: Oxford University Press.
- Kuroda, S-Y. (1988). Whether we agree or not. *Linguisticae Investigationes*, 12, 1-47.
- Laenzlinger, C. (1993). Principles for a formal and computational account of adverbial syntax. Unpublished manuscript, Universite de Geneve.
- Larson, R. (1987). Missing pronouns and the analysis of free relative clauses. *Linguistic Inquiry*, 18, 239-266.
- Lee, H. (2006). A study on scrambling in Korean: The minimalist approach. *Studies in Generative Grammar*, 16, 425-460.
- Lee, W-B, and S-E Cho. (2003). Is scrambling EPP-driven? *Studies in Generative Grammar*, 13, 331-341.
- Lee, Y-S. (1993). *Scrambling as case-driven obligatory movement*. Unpublished doctoral dissertation, University of Pennsylvania.
- McConnell-Ginet, S. (1982). Adverbs and Logical Form. *Language*, 58, 144-184.
- Miyagawa, S. (1997). Against optional scrambling. *Linguistic Inquiry*, 28, 1-25.
- Miyagawa, S. (2001). The EPP, scrambling, and wh-in-situ. In M. Kesntowicz (Ed.), *Ken Hale: A life in language* (pp. 293-338).

- Cambridge, MA: MIT Press.
- Miyagawa, S. (2003). A-movement scrambling and options without optionality. In S. Karimi (Ed.), *Word order and scrambling* (pp. 177–200). Blackwell Publishers.
- Miyagawa, S. (2006). On the ‘undoing’ nature of scrambling: a response to Bošković. *Linguistic Inquiry*, 37, 607–624.
- Miyagawa, S. (2010). *Why Agree? Why Move? Unifying agreement-based and discourse configurational languages*. Cambridge, MA: MIT Press.
- Miyagawa, S. (2017). *Agreement beyond phi*. Cambridge, MA: MIT Press.
- Miyagawa S., Wu, D., & Koizumi, M. (2018). Deriving Case Theory. Unpublished manuscript, MIT/University of Tokyo, MIT, and Tohoku University.
- Moon, G-S. (2018). Some Remarks on the VP-dislocation analysis of English VP-fronting. *Studies in Generative Grammar*, 28(1), 233–251.
- Ott, D. (2018). VP-fronting: Movement vs. dislocation. *The Linguistic Review*, 35(2), 243–282.
- Park, M-K., & Yoo, Y-S. (2019). Scrambling in Korean and the labeling theory. *Studies in Modern Grammar* 102, 1–30.
- Rijhoek, P. (1994). *On adverbs and antisymmetric minimalism*. MA Thesis, University of Groningen.
- Saito, M. (1985). *Some Asymmetries in Japanese and their theoretical implications*. Ph.D. dissertation, MIT.
- Saito, M. (1992). Long-distance scrambling in Japanese. *Journal of East Asian Linguistics*, 1, 69–118.
- Saito, M. (2003). A derivational approach to the interpretation of scrambling chains. *Lingua*, 113, 481–518.
- Saito, M. (2016). (A) Case for Labeling: Labeling in languages without f-feature agreement. *The Linguistic Review*, 33, 129–175.
- Saito, M., & Fukui, N. (1998). Order in phrase structure and movement. *Linguistic Inquiry*, 29, 439–474.
- Sportiche, D. (1988). A theory of floating quantifiers and its corollaries for constituent structure. *Linguistic Inquiry*, 19, 425–449.
- Sportiche, D. (1994). Adjuncts and adjunction. *GLOW Newsletter* 32, 54–55.

- Stroik, T. (1990). Adverbs as V-sisters. *Linguistic Inquiry*, 21, 654–661.
- Tada, H. (1993). *A/A-bar partition in derivation*. Doctoral dissertation, MIT.
- Takano, Y. (1998). Object shift and scrambling. *Natural Language and Linguistic Theory*, 16, 817–889.
- Travis, L. (1988). The syntax of adverbs. *McGill Working Papers in Linguistics on Comparative Syntax*, 280–310.
- Webelhuth, G. (1989). *Syntactic saturation phenomena and the modern Germanic languages*. Doctoral dissertation, University of Massachusetts, Amherst.
- Yang, D-W. & Kim, S-H. (2005). Scrambling and interpretive complex. *The Linguistic Association of Korea Journal*, 13(2), 169–193.
- Yoo, Y-S.. (2018). *Mobility in Syntax: On Contextuality in Labeling and Phases*. Unpublished Ph.D. dissertation, University of Connecticut at Storrs.
- Yoon, J. H-S. (2004). Non-nominative (major) subjects and case stacking in Korean. In P. Bhoskaravao & K. V. Subbarao (Eds.), *Nonnominative subjects*, 2 (pp. 265–314). Amsterdam: John Benjamins.
- Zubizarreta, M. L. (1982). *On the relationship of the lexicon to syntax*. Doctoral Dissertation, MIT.
- Zubizarreta, M. L. (1987). *Levels of representation in the lexicon and in the syntax*, Dordrecht: Foris.

Rhanghyeyun Kim

Professor

English Studies, Division of Global Studies

College of Global Business, Korea University

2511 Sejong-ro, Sejong City, 30019, KOREA

Phone: +82-044-860-1235

Email: rhylee@korea.ac.kr

Received on June 20, 2019

Revised version received on September 20, 2019

Accepted on September 30, 2019