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Selection and Semantic Compatibility
in the Formation and Interpretation of
Phrase Structure

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- [2] Saito, Mamoru (2012) "Semantic and Discourse Effects of Scrambling," in Bjarke Frellesvig, Jieun Kiaer and Janick Wrona, eds., *Studies in Japanese and Korean Linguistics*, Lincom GmbH, München, 146-172.
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Selection and Incorporation in Complex Predicate Formation¹

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1. Introduction

The purpose of this paper is to examine the roles of selection and incorporation in complex predicate formation. I consider lexical complex predicates in Japanese, the resultative serial verb construction in Edo, and compound verbs in Chinese, exemplified in (1)-(3) respectively.

- (1) Hanako-ga Taroo-o osi-taosi-ta
Hanako-NOM Taroo-ACC push-make.fall-Past

‘Hanako pushed Taroo and made him fall.’

- (2) Òzó suá Úyi dé
Ozo push Uyi fall

‘Ozo pushed Uyi, which made him fall.’

- (3) Ta he-zui (jiu) le
he drink-get.drunk wine Asp.

‘He drank (wine) and got drunk.’

(2) instantiates a serial verb construction with two independent verbs. But I assume, following the analysis proposed in Saito (2001), that the second verb covertly incorporates into the first and forms a complex predicate.

The three constructions are subject to different constraints. Thus, a Japanese lexical complex predicate cannot be formed with the two verbs in (2) or (3), as shown in (4).

¹ This is a revised version of part of the material presented in a colloquium at Harvard University in 2003 and in a syntax seminar at the University of Connecticut in 2005. I would like to thank Jim Huang, Jonathan Bobaljik and Diane Lillo-Martin, among others, for helpful comments. I benefited from discussions with many people at various occasions. Special thanks are due to Mark Baker and Jim Huang for their extensive help with the analysis as well as the data. Shengli Feng, Seng-hian Lau and Dylan Tsai also kindly provided me with relevant data from Classical Chinese and Chinese dialects. I regret that I was unable to discuss them in this version of the paper.

- (4) a. *Hanako-ga Taroo-o osi-taore-ta
Hanako-NOM Taroo-ACC push-fall-Past

‘Hanako pushed Taroo, which made him fall.’

- b. *Hanako-ga wain-o nomi-yot-ta
Hanako-NOM wine-ACC drink-get.drunk-Past

‘Hanako drank wine and got drunk.’

Although other factors may also be involved in these differences, I explore the hypothesis that they arise because of the ways in which derivations are constrained by selectional restrictions and the interpretive mechanism of chains formed by incorporation. Kageyama (1993) argues that Japanese lexical complex predicates are formed before they merge into larger syntactic structures, i.e., in the lexicon in his terms. As mentioned above, the resultative serial verb construction in Edo arguably involves covert incorporation. And I explore the possibility, extending the ideas in Tang (1997) and Huang (2006), that Chinese compound verbs are derived by overt incorporation. The hypothesis pursued in this paper is that selection and chain interpretation interact with these differences in derivation and yield the variations in the possible combinations of verbs.²

In the following section, I discuss the transitivity harmony principle, proposed by Kageyama (1993) as a generalization on Japanese lexical complex predicates, and argue that it follows from the selectional relation between *v* and *V*. Then, in Section 3, I examine the consequences of this proposal for the Japanese light verb construction and the Edo resultative serial verb construction. The conclusion there is that selectional restrictions are constraints on the application of Merge, as opposed to the resulting phrase structure. In Section 4, I turn to Chinese examples with compound verbs and illustrate their peculiarities in contrast with the phrasal resultative construction with two independent verbs in the language. Finally, I compare the Edo serial verbs with Chinese compound verbs in Section 5 and suggest that their differences may be attributed to the covert vs. overt distinction in complex predicate formation. Section 6 concludes the paper.

2. Japanese Lexical Complex Predicates

In this section, I argue that the restrictions on Japanese lexical complex predicates follow, to a large extent, from the selectional requirements of *v*. I first briefly review Kageyama’s

² Li (1993) presents the most detailed comparison of Japanese lexical complex predicates and Chinese compound verbs, to my knowledge. He assumes that both are formed in the lexicon with composite argument structures. His analysis for the differences between the two, roughly speaking, is based on the proposal that only the former is “doubly headed.” Although the account to be proposed in this paper is syntactic and is quite different from Li’s, it does share some of his insights abstractly.

(1993) analysis and then present the argument.

Japanese employs complex predicates extensively. Kageyama, first, divides them into two groups, lexical and syntactic. A syntactic complex predicate projects a structure with clausal embedding, where each element of the complex predicate functions as an independent verb and projects a VP. Typical examples are shown in (5).

- (5) a. Hanako-ga Taroo-ni wani-o tabe-sase-ta
Hanako-NOM Taroo-DAT alligator-ACC eat-make-Past

‘Hanako made Taroo eat alligator meat’

- b. Taroo-ga wani-o tabe-hazime-ta
Taroo-NOM alligator-ACC eat-start-Past

‘Taroo started to eat alligator meat’

As Kageyama points out, the first verb projects an independent VP in these examples, and hence, a pro-VP (or V’) form *soo su* ‘do so’ can substitute for the VP. This is shown in (6).

- (6) a. Hanako-ga Taroo-ni soo s-ase-ta
Hanako-NOM Taroo-DAT so do-make-Past

‘Hanako made Taroo do so.’

- b. Taroo-ga soo si-hazime-ta
Taroo-NOM so do-start-Past

‘Taroo started to do so.’

A lexical complex predicate, on the other hand, projects a single VP. Examples are provided in (7).

- (7) a. Taroo-ga ana-ni suberi-oti-ta
Taroo-NOM hole-in slip-fall-Past

‘Taroo slipped and fell into a hole.’

- b. Hanako-ga me-o naki-harasi-ta
Hanako-NOM eye-Acc cry-make.swollen-Past

‘Hanako cried and made her eyelids swollen.’

In this case, the pro-VP (V’) form *soo su* cannot substitute for the first verb (and its internal arguments) as in (6) because the first verb does not project a VP (V’) by itself. Thus, the

examples in (8) are ungrammatical as expected.

- (8) a. *Taroo-ga (ana-ni) soo si-oti-ta
b. *Hanako-ga (me-o) soo si-harasi-ta

Kageyama (1993), then, presents (9) as a generalization that applies to lexical complex predicates.

(9) Transitivity Harmony Principle

In a lexical complex predicate V_1+V_2 , if one of the verbs takes an external argument, so does the other one.

This generalization is based on the observation that complex predicates that consist of two unaccusative verbs and those that include two unergative/transitive verbs are abundant, but we rarely find those that combine an unaccusative verb and an unergative/transitive verb. Relevant examples are listed in (10).

- (10) a. transitive-transitive: *hiki-nuk* (pull-pull.out), *nigiri-tubus* (grasp-crash),
tataki-otos (hit-make.drop), *kiri-tor* (cut-remove)
b. unergative-unergative: *hasiri-yor* (run-go close), *tobi-ori* (jump-go down),
aruki-mawar (walk-go.around), *mure-tob* (form.a.flock-fly)
c. unaccusative-unaccusative: *suberi-oti* (slip-fall), *ukabi-agar* (float-rise),
umare-kawar (be.born-change), *huri-sosog* (fall-flow)
d. transitive-unergative: *moti-aruk* (carry-walk), *sagasi-mawar* (look.for-go.around),
mati-kamae (wait.for-hold)
e. unergative-transitive: *naki-haras* (cry-make swollen), *nori-kae* (ride.on-change),
nomi-tubus (drink-waste)

Note that **osi-taore* ‘push-fall’ and **nomi-yow* ‘drink-get.drunk’ in (4) instantiate the transitive-unaccusative combination and are ill-formed. (11a-b), which contain complex predicates of unaccusative-transitive combination, are equally ungrammatical.

- (11) a. *Kareha-ga zimen-o oti-kakusi-ta
dead.leaf-NOM ground-ACC fall-hide-Past
‘Dead leaves fell and covered the ground.’

- b. *Taroo-ga kuzira-o ukabi-mi-ta
 Taroo-NOM whale-ACC float-see-Past

‘A whale came to the surface and Taroo saw it.’

Kageyama’s generalization in (9) has been discussed extensively since it was proposed. Yumoto (1996) and Matsumoto (1998), for example, present detailed semantic analyses for lexical complex predicates, and point out some potential counter-examples to the generalization. However, as Kageyama (1999) notes, those examples, even if they are indeed problematic, are quite limited, and (9) clearly expresses a strong tendency that is observed uniquely with Japanese lexical complex predicates.³ At the same time, the generalization, if correct, calls for an explanation. Kageyama (1993) proposes (9) as a language-specific constraint on lexical complex verb formation. But this raises questions as it is not clear why Japanese should have this constraint and how children acquire it, for example, based on positive evidence. Here, I propose that (9) is to be derived from selection.

It is widely assumed that both of the component verbs in a lexical complex predicate participate in θ -marking. Thus, in (1), repeated below as (12), *Hanako* is the subject and *Taroo* is the object of both *os* ‘push’ and *taos* ‘make.fall’.

³ It seems to me that the most serious issue is the scope of the generalization rather than its accuracy. As far as I know, there are three kinds of potential counter-examples. The first includes cases where the same verb combines with an unergative verb as well as an unaccusative verb, as in *naki-sakeb* ‘cry-scream’ and *naki-kuzure* ‘cry-collapse’. But *nak*, for example, can mean ‘cry’ or ‘be in tears’ and may be ambiguous between unergative and unaccusative. The second group consists of examples where the second verb is *aki* ‘be bored with, be tired of’, *tukare* ‘be tired with’ or the like, as in (i).

- (i) Taroo-wa gengogaku-no hon-o yomi-aki-ta
 Taroo-TOP linguistics-GEN book-ACC read-be.tired-Past
 ‘Taroo was tired of reading linguistics books.’

The *soo su* ‘do so’ test mentioned in the text would classify *yomi-aki* in (i) as a lexical complex predicate, but the possibility seems to remain that *aki* takes a full vP complement because the accusative on the object comes from the transitive *yom* rather than the unaccusative *aki*. That is, the failure of *soo su* substitution may be a necessary but not a sufficient condition for a complex predicate to be lexical. The last group consists of examples like *tobi-kom* ‘jump-go.into’, where it is dubious that the second verb has an argument structure of its own. There is no independent verb *kom* with the appropriate meaning. If Kageyama’s generalization has to do with the argument structures of the component verbs, it may not include these examples in its scope to begin with. Kageyama (1993) in fact proposes to analyze *kom* as a verbal suffix that adds information to the lexical-conceptual structure. Finally, as compounds are at issue, it is not surprising if there are cases where they are lexicalized and registered in the lexicon independently of the parts they seem to be composed of. Once this possibility is granted, the generalization loses its strict falsifiability. But it is difficult to avoid the situation with the investigation of compounds, and as stated in the text, the generalization holds over a large domain with at most limited potential counter-examples. See the references cited for more detailed discussion on this issue.

- (12) Hanako-ga Taroo-o osi-taosi-ta
 Hanako-NOM Taroo-ACC push-make.fall-Past

‘Hanako pushed Taroo and made him fall.’

The sentence cannot depict a situation in which Hanako pushed a chair and as a result made Taroo fall. This implies that each verb is visible in the interpretation of a larger structure. (13) illustrates how *osi* and *taos* assign the theme role to *Taroo*.

- (13) [_{VP} Taroo [_V [_V osi]-[_V taos]]]
-

Further, Kageyama (1993) presents clear evidence that each verb in a lexical complex predicate participates in the selectional relations with the arguments. As Japanese morphology is head-final, it is not surprising that the second verb projects its argument structure in the syntax. But the following examples, adopted from Kageyama (1993) with slight changes, demonstrate that the arguments must satisfy the selectional requirements of the first verb as well:

- (14) a. Tuta-ga boo-ni maki-tui-ta
 ivy-NOM stick-to wind-attach-Past

‘An ivy twined around the stick.’

- b. Abura-ga kabe-ni simi-tui-ta
 oil-NOM wall-to soak-attach-Past

‘The wall was stained with oil.’

- (15) a. *Tuta-ga boo-ni simi-tui-ta
 ivy-NOM stick-to soak-attach-Past

‘The stick was stained with an ivy.’

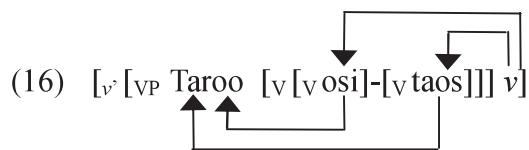
- b. *Abura-ga kabe-ni maki-tui-ta
 oil-NOM wall-to wind-attach-Past

‘The oil twined around the wall.’

(15a) is ungrammatical because an ivy cannot soak into a stick, and (15b) because oil cannot twine around a wall.

But if both verbs in a lexical complex predicate have selectional relation with the object, they must also participate in the selectional relation with *v* when *v* and VP are merged. (16)

illustrates this with *osi-taos* ‘push-make.fall’ in (12).



Here, v comes in two varieties, v^* and v , as proposed in Chomsky (1995). v^* selects for a transitive/unergative V and hosts an external argument, while v selects for an unaccusative V. Then, the v in (16) must be v^* and the structure is well-formed as it enters into proper selectional relation with two transitive verbs. When the complex predicate consists of two unaccusative verbs, the structure should also be legitimate with v selecting for unaccusatives. But when the complex predicate consists of an unaccusative verb and a transitive/unergative verb, a conflict in the selectional relation with v arises. If the VP merges with v^* , then the v^* does not select for the unaccusative verb. On the other hand, if v is employed, its selectional requirement fails with the transitive/unergative verb. Thus, Kageyama’s transitivity harmony principle is derived.

3. Complex Predicate Formation with Covert Incorporation

In this section, I assume the account for the restriction on the Japanese lexical complex predicates just presented, and explore its consequences for the analysis of the Japanese light verb construction and the Edo resultative serial verb construction. I argued in Saito (2001) that these constructions involve formation of complex predicates by covert incorporation.⁴ I first show that the Japanese light verb construction exhibits a restriction similar to “transitivity harmony,” and argue that the account proposed in the preceding section extends to this case. Then, I discuss the Edo resultative serial verb construction, and draw the conclusion that selection is a derivational constraint that applies to the application of Merge.

Let us start with the Japanese light verb construction. Typical examples are shown in (17).

- (17) a. Hanako-ga Taroo-ni [_{NP}toti -no zyooto]-o si-ta
 Hanako-NOM Taroo-DAT land-GEN giving-ACC do-Past
 ‘Hanako gave a piece of land to Taroo.’

⁴ I do not repeat the arguments here and refer the reader to Saito (2001). See also Grimshaw and Mester (1988), Hoshi (1995), and Saito and Hoshi (2000) for detailed discussion on the Japanese light verb construction, and Stewart (1998), and Baker and Stewart (1999) for comprehensive examination of the Edo serial verb constructions.

- b. Hanako-ga Taroo-kara [_{NP} hooseki-no ryakudatu]-o si-ta
 Hanako-NOM Taroo-from jewelry-GEN robbery-ACC do-Past
 ‘Hanako robbed Taroo of jewelries.’

The peculiarity of this construction, as discussed in detail in Grimshaw and Mester (1988), is that the goal argument in (15a) and the source argument in (15b), *Taroo*, are θ -marked by the head noun of the direct object, *zyooto* in (15a) and *ryakudatu* in (15b) respectively. Given this, it is proposed in Saito and Hoshi (2000) that the head noun of the direct object covertly incorporates into the light verb *su* ‘do’ and θ -marks *Taroo*.

(18) shows the structure of vP in (17a).⁵

- (18) [_{vP} Hanako-ga [_{v'} [_{VP} Taroo-ni [_{v'} [_{NP} toti-no [_N zyooto]]]-o [_v [_N zyooto] [_v su]]]] v]]
-

The head noun *zyooto* ‘giving’ assigns the theme role to *toti* ‘land’ in the initial position, and then, covertly incorporates into the verb *su* ‘do’ and assigns the goal role to *Taroo* from the landing site. If the initial merger of an argument into a structure is confined to its θ -position, as proposed in Chomsky (1995), then the covert incorporation must take place cyclically, that is, as soon as the V *su* merges with the complement accusative NP. This is so because the position of *Taroo* becomes a θ -position only after the incorporation of *zyooto* into *su*. The cyclic application of covert movement is indeed possible, given the single-cycle model of Bobaljik (1995), where the only distinction between overt and covert movements is whether the phonetic features are realized at the landing site or the initial site.

Grimshaw and Mester (1988) point out a number of interesting constraints on the light verb construction. Among them is that the head noun of the accusative NP cannot be unaccusative. This is illustrated in (19).

- (19) a. *Mizu-ga (sara-kara) zyoohatu-o si-ta
 water-NOM dish-from evaporation-ACC do-Past
 ‘The water evaporated from the dish.’
 b. *Antena-ga (yane-kara) rakka-o si-ta
 antenna-NOM roof-from falling-ACC do-Past
 ‘The antenna fell from the roof.’

These examples receive a straightforward account along the lines proposed in Miyagawa

⁵ Saito and Hoshi (2000) assume the classical VP-internal subject hypothesis, and hence, place the subject within VP. I assume here that it is merged at vP Spec.

(1989) and Tsujimura (1990). The v in these sentences must be a v^* as an accusative NP is present. Then, there must be an external argument, which is absent in both (19a) and (19b).

But interestingly, the light verb construction is incompatible with an unaccusative noun even in the presence of an external argument, as shown in (20).

(20) a. *Taroo-ga sara-kara [NP mizu-no zyoohatu]-o si-ta
 Taroo-NOM dish-from water-GEN evaporation-ACC do-Past

‘Taroo made the water evaporate from the dish.’

b. *Hanako-ga yane-kara [NP antena-no rakka]-o si-ta
 Hanako-NOM roof-from antenna-GEN falling-ACC do-Past

‘Hanako made the antenna fall from the roof.’

In this case, there should not be any problem with θ -marking, as illustrated in (21) for (20a).

(21) [_{VP} Taroo-ga [_v [_{VP} sara-kara [_v [_{NP} mizu-no [_N zyoohatu]]-o [_v [_N zyoohatu] [_v su]]]] v]]

Zyoohatu ‘evaporation’ assigns the theme role to *mizu* ‘water’ in situ, and then assigns the source role to *sara* ‘dish’ after covertly incorporating into *su* ‘do’. In addition, v hosts the required external argument, *Taroo*, in its Spec.

But the analysis presented in the preceding section predicts the ungrammaticality of (20a, b) straightforwardly. Note that the covert incorporation of a noun into *su* creates a complex predicate, and that the formed complex predicates in (20a, b) do not conform to Kageyama’s (1993) transitivity harmony principle. In these examples, the complex predicate consists of an unaccusative noun and the verb *su*, which requires an external argument. Hence, the v , whether it is v^* or v , cannot have proper selectional relations with both. The grammatical (17a, b) do not face this problem because the incorporated noun is transitive in both cases.

It was shown that the account for Kageyama’s transitivity harmony principle extends to complex predicates formed by covert incorporation. In the remainder of this section, I argue that the Edo resultative serial verb construction, which seems problematic on the surface, provides us with further insights into the role of selection in the derivation.

Representative examples of the Edo construction are shown in (22).

(22) a. Òzó suá Úyi dé
 Ozo push Uyi fall

‘Ozo pushed Uyi, which made him fall.’

- b. Òmó dé wú
child fall die

‘The child fell and died.’

I proposed in Saito (2001) that this construction involves covert incorporation just as in the case of the Japanese light verb construction. The derivation of (22a) is illustrated in (23).

- (23) [_{VP} Òzó [_v v [_{VP} Úyì [_V [_V suá] [_V dé]] [_{VP} [_V dé]]]]]
-

(22a) exhibits the typical resultative paradox, that is, the object *Úyì* receives θ -roles from both *suá* ‘push’ and *dé* ‘fall’. The paradox is resolved by covert incorporation in (23). The matrix verb *suá* takes the VP headed by *dé* as a complement and hosts *Úyì* in its Spec position. This configuration allows *suá* but not *dé* to θ -mark *Úyì*. But the incorporation of *dé* to *suá* creates the desired configuration that makes it possible for both *suá* and *dé* to θ -mark *Úyì*.⁶

This analysis appears to be in conflict with the proposal on “transitivity harmony” presented earlier because the complex predicate formed by covert incorporation consists of the transitive *suá* ‘push’ and the unaccusative *dé* ‘fall’. But there is a crucial difference between this case and the Japanese light verb construction. In the latter, the covert incorporation was required for the merger of an internal argument in VP Spec. In (17a), repeated below as (24), the incorporation of *zyooto* ‘giving’ makes it possible for *Taroo* to merge into a θ -position.

- (24) Hanako-ga Taroo-ni [_{NP} toti -no zyooto]-o si-ta
Hanako-NOM Taroo-DAT land-GEN giving-ACC do-Past

‘Hanako gave a piece of land to Taroo.’

Hence, the covert incorporation must apply cyclically prior to the merger of *Taroo*, and consequently before the merger of *v* into the structure. The situation in (23) is different. Since *suá* ‘push’ θ -marks *Úyì*, the incorporation of *dé* ‘fall’ is not required for the merger of *Úyì* into the structure. Then, the incorporation can apply after *v* is merged into the structure as illustrated in (25).

- (25) a. [_v v [_{VP} Úyì [_V [_V suá] [_{VP} [_V dé]]]] (merger of *v* with VP headed by *suá*)
- b. [_v [_v v [_V suá]] [_{VP} Úyì [_V [_V suá]] [_{VP} [_V dé]]]] (overt incorporation of *suá* into *v*)
- c. [_v [_v v [_V suá]] [_{VP} Úyì [_V [_V suá]] [_V dé]] [_{VP} [_V dé]]]] (covert incorporation of *dé*)
-

⁶ *Suá* raises overtly to *v*, yielding the surface word order.

This derivation allows v , or more precisely v^* in this case, to satisfy its selectional requirement at the point it is merged into the structure. Thus, there is a way for the Edo resultative construction to circumvent “transitivity harmony.”

The account for the difference between Japanese and Edo proposed above has a few consequences. First, incorporation can apply as soon as the target is introduced into the structure as in the case of the Japanese light verb construction, or wait until a later point as in (25). Second, the analysis of Edo implies that selectional restrictions are constraints on the application of Merge, and not on the derived structure. This is so since v^* in (25) is in a proper selectional relation with the complement V at the point it is merged into the structure as in (25a), but not after *dé* ‘fall’ incorporates into *suá* ‘push’ as can be seen in (25c). This conclusion may seem surprising because selectional requirements are understood to be semantic in nature. However, it is in accord, for example, with the head movement of *be* to T as in (26).

(26) Mary thinks [_{CP} that [_{TP} John is not the best candidate]]

The main verb *be* raises to T in the embedded clause of (26). Nevertheless, the embedded C is in selectional relation only with the embedded T and not with the raised verb. The conclusion indeed seems plausible.

4. Chinese Compound Verbs and the Object Restriction

Chinese compound verbs are not subject to transitivity harmony either. For example, the following examples cited from Huang (1992) contain compounds that consist of a transitive/unergative verb and an unaccusative verb:

(27) a. Ta chi-bao (fan) le
he eat-full rice Asp.

‘He ate (rice) and became full.’

b. Ta he-zui (jiu) le
he drink-drunken wine Asp.

‘He drank (wine) and became drunk.’

If these compounds are formed by overt incorporation, they can be accounted for in the same way as Edo. That is, the incorporation of the second verb into the first applies after v is merged into the structure. At the same time, Chinese resultatives with compound verbs exhibit an outstanding property that is not shared by the Edo resultatives: they are not subject to Simpson’s (1983) object restriction. I discuss this property in this section and then compare Chinese and Edo in the next.

It is known that resultative constructions are, to a large extent, subject to the object

restriction, as discussed in detail in Simpson (1983). The restriction states that the result predicate is predicated on the object. Thus, the contrast between (28) and (29) obtains.

- (28) a. John painted the barn red
 b. The metal_i was pounded *t_i* flat
 c. The liquid_i froze *t_i* solid

- (29) a. *John ran tired
 b. *Mary ate the rice full

The restriction applies to the Edo resultative serial verb construction as well, as pointed out in Baker and Stuart (1999).⁷ The following examples illustrate this:

- (30) a. *Òzó ré kp`Ol`O
 Ozo ate be.big
 ‘Ozo ate himself fat.’
 b. *Òzó dá (ày`On) mu`Emu`E
 Ozo drink palm wine be.sluggish
 ‘Ozo drank palmwine and became sluggish.’

On the other hand, Chinese compound verbs are not subject to this restriction as discussed in detail in Li (1990, 1993) and Huang (1992). This is demonstrated by the examples in (27). The subject *ta* ‘he’ becomes full in (27a) and becomes drunk in (27b). In this section, I briefly go over the discussion in Huang (2006), which indicates that the object restriction is inapplicable to the Chinese examples in (27) because they employ compound verbs unlike the English examples in (29) or the Edo examples in (30).

Huang (2006) examines the absence of the object restriction in Chinese in detail. He first notes that compound resultatives and non-compound, phrasal resultatives both apparently do not exhibit the object restriction. (31a) contains a compound *tiao-lei* ‘dance-tired’ whereas (31b) has two independent predicates *xiao* ‘laugh’ and *zhan-bu-qilai* ‘cannot-stand-up’ with the former followed by *de*.⁸

⁷ It is distinguished in this respect from the other serial verb constructions in the language, covert coordination and the consequential serial verb construction. See Baker and Stewart (1999) for detailed discussion.

⁸ Huang’s (2006) analysis crucially relies on the properties of *de*, which will be discussed later.

- (31) a. Lisi tiao-lei le
Lisi dance-tired Asp.
'Lisi danced himself tired.'
- b. Zhangsan xiao-de zhan-bu-qilai
Zhangsan laugh-till cannot-stand-up
'Zhangsan laughed so much that he couldn't stand up.'

But the violation of the object restriction in phrasal resultatives, Huang argues, is only apparent.

The resultatives with compounds are not totally free of restrictions. For example, Huang (2006) notes that (27a) is acceptable in the presence of an object only when the object is a bare NP that is part of the expression *chi fan*, which simply means 'eat' or 'have a meal'. Thus, the following example is unacceptable:

- (32) *Zhangsan chi-bao-le na-wan fan / liang-wan fan
Zhangsan eat-full-Asp. that-bowl rice two-bowl rice
'Zhangsan ate that bowl of rice / two bowls of rice and became full.'

However, he also notes that there are examples in which the result predicate can or even must be predicated of the subject even when the object is referential. (33) is one of his examples.

- (33) Zhangsan kan-lei-le Lisi / na-ge ren
Zhangsan chase-tired-Asp. Lisi that person
'Zhangsan chased Lisi / that person and became tired.'

Given this, he concludes that the second verb in a resultative compound may sometimes be predicated of the subject even in the presence of an object.

The pattern that Chinese phrasal resultatives with two independent verbs exhibit is quite different. Although the second verb can apparently be predicated of the subject as in (31b), this is possible only when the first verb is unergative. When the first verb is transitive and an object appears, the object restriction is indeed observed. The following contrast between a compound resultative and a phrasal resultative illustrates this:⁹

- (34) a. Lisi qi-lei-le ma le
Lisi ride-tired-Asp. horse Asp.

⁹ Huang notes that there are limited potential counter-examples to this generalization and offers speculations on them.

- (i) ‘Lisi rode a horse and got tired from it.’
- (ii) ‘Lisi rode a horse and got the horse tired.’

b. Lisi *qi-de ma hen lei*
 Lisi ride-till horse very tired

‘Lisi rode a horse and got the horse tired.’

In (34a) with the compound *qi-lei* ‘ride-tired’, *lei* can be predicated of the subject, *Lisi*. But (34b) only has the reading in which *lei* is predicated of the object, *ma* ‘horse’.

Having observed that subject predication is allowed in phrasal resultatives only when the first verb is unergative, Huang (2006) goes on to argue that the violation of the object restriction in this case is only apparent. He first notes that phrasal resultatives with unergative verbs exhibit inchoative-causative alternation as shown in (35).

(35) a. Ta *tiao-de man-shen-da-han*
 he dance-till whole-body-big-sweat

‘He danced [himself] all sweaty.’

b. Yi-zhi *tangewu tiao-de ta man-shen-da-han*
 one-CL tango dance-till he whole-body-big-sweat

‘A tango dance caused him to dance himself all sweaty.’

Here, it is known that unaccusatives, but not unergatives, show alternation of this kind. (36b) is fine but (37b) is totally ungrammatical.

(36) a. The boat sank
 b. The bomb sank the boat

(37) a. John laughed
 b. *The joke laughed John

Then, the grammaticality of (35b) indicates that *tiao-de* in (35a) is unaccusative. At this point, Huang observes that *-de* evolved out of the verb *de* ‘get’, which can be paraphrased as *bian-de* ‘become’ or *shi-de* ‘cause’, just like its English translation *get*. He then proposes that *-de* with the unaccusative meaning ‘become’ heads *tiao-de* in (35a), and *tiao* modifies it indicating the manner in which the event happens.

Huang’s (2006) analysis of phrasal resultatives in Chinese implies that they are subject to the object restriction. Then, the violation of the restriction is a unique property of the compound resultatives. In the following section, I consider the difference between the Chinese compound

resultatives and the Edo serial verb resultatives with respect to the object restriction. I entertain the possibility that the difference arises because incorporation is overt in the former while it is covert in the latter, and present an analysis in terms of chain interpretation.¹⁰

5. Comparison of Chinese Compound Resultatives with Edo Resultatives

As discussed in the preceding section, Edo resultative serial verb construction exhibits the object restriction whereas the Chinese resultative construction with compounds does not. Relevant examples in (30) and (27) are repeated in (38) and (39).

(38) a. *Òzó ré kp`Ol`O
Ozo ate be.big

‘Ozo ate himself fat.’

b. *Òzó dá (ày`On) mu`Emu`E
Ozo drink palm wine be.sluggish

‘Ozo drank palmwine and became sluggish.’

(39) a. Ta chi-bao (fan) le
he eat-full rice Asp.

‘He ate (rice) and became full.’

b. Ta he-zui (jiu) le
he drink-drunken wine Asp.

‘He drank (wine) and became drunk.’

In this section, I investigate the source of this difference on the assumption that the compounds in (39) are formed by overt incorporation.

Let me first note that the incorporation analysis proposed in Section 3, as it stands, allows both (38) and (39). A possible derivation for (38a) is shown in (40).

(40) a. [_{VP} Òzó [_{v`v} [_{VP} [_v ré] [_{VP} [_v kp`Ol`O]]]]] (Merge to yield the base vP structure)

b. [_{VP} Òzó [_{v`v} [_{VP} [_v [_v ré] [_v kp`Ol`O]]] [_{VP} [_v kp`Ol`O]]]]]

¹⁰ The Edo construction is chosen as the target of comparison because I argued in Saito (2001) that it involves covert incorporation. It is argued there that English resultatives are not derived by covert incorporation but by NP movement. A discussion of the derivation of Chinese phrasal resultatives is beyond the scope of this paper. I refer the reader to Huang (2006) for an analysis.

c. [_{VP} Òzó [_v [_v v [_V [_v ré] [_v kp`Ol`O]]] [_{VP} [_v [_v ré] [_v kp`Ol`O]] [_{VP} [_v kp`Ol`O]]]]]

In (40b), *kp`Ol`O* ‘be.full’ covertly incorporates into *ré* ‘ate’. Then, the complex *V, ré- kp`Ol`O* ‘ate-be.full’ overtly raises to *v* in (40c). The second verb *kp`Ol`O* should be able to θ -mark Òzó from this position, yielding the intended interpretation. The Chinese (39a) can be analyzed in exactly the same way. Its derivation is shown in (41).¹¹

(41) a. [_{VP} Ta [_v v [_{VP} fan [_v [_v chi] [_{VP} [_v bao]]]]] (Merge to yield the base vP structure)

b. [_{VP} Ta [_v v [_{VP} fan [_v [_v [_v chi] [_v bao]]] [_{VP} [_v bao]]]]]

c. [_{VP} Ta [_v v [_V [_v chi] [_v bao]]] [_{VP} fan [_v [_v [_v chi] [_v bao]]] [_{VP} [_v bao]]]]]

In (41b), *bao* ‘full’ incorporates into *chi* ‘eat’ to form a compound. The compound, then, raises to *v* in (41c), and *bao* θ -marks *ta* ‘he’ from this position.

The fact that (39a) can be analyzed as in (41) suggests that this may indeed be a viable analysis for the example. The issue, then, is why (38a) cannot have the derivation in (40). Here, the obvious difference between Edo and Chinese is whether the incorporation in Step b is covert or overt. Let us then explore the possibility to attribute the contrast between (38) and (39) to this difference.

Throughout this paper, I have been assuming Bobaljik’s (1995) proposal that the only difference between overt movement and covert movement is whether the phonetic features are interpreted at the landing site or at the initial site. I express this as in (42), where α is α with its phonetic features deleted.

(42) a. overt movement: α ... α

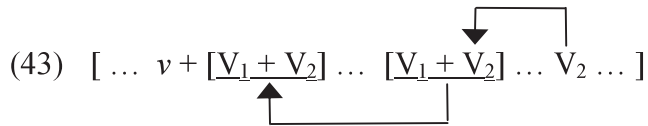
b. covert movement: α ... α

Then, phonetic features are deleted at the initial site with overt movement whereas they are deleted at the landing site with covert movement. Assuming that there is indeed deletion of phonetic features in this way, there are two possibilities with the timing of the deletion. First, the deletion of phonetic features can apply as soon as the movement takes place. Second, the

¹¹ I ignore the aspect *le* in (41) as it is irrelevant for the point made here.

deletion can apply at the phase level as part of the Transfer Operation in the sense of Chomsky (2005), which sends information to the C-I system and the S-M system. Let us consider these two possibilities for the derivations in (40) and (41) to see if they successfully distinguish these derivations.

The Chinese case in (41) is straightforward. The derivations in (40)-(41) can both be schematically expressed as in (43).



For (41), if deletion takes place after each step of the derivation, then the phonetic features of V_2 are deleted at the initial site after the verb incorporates into V_1 as in (44a).

- (44) a. [... $[V_1 + V_2]$... $\cancel{V_2}$...]
 b. [... $v + [V_1 + V_2]$... $[V_1 + V_2]$... $\cancel{V_2}$...]
 c. [... $v + [V_1 + V_2]$... $[\cancel{V_1} + \cancel{V_2}]$... $\cancel{V_2}$...]

Then, $V_1 + V_2$ incorporates into v as in (44b), and its phonetic features are deleted at the initial site as in (44c). Thus, the grammatical examples in (39) are successfully derived. But this does not provide evidence that deletion of phonetic features applies cyclically. This is because the same result obtains even if deletion applies after the construction of the vP phase is completed. (43) contains two chains, (V_2, V_2) and $(V_1 + V_2, V_1 + V_2)$. The phonetic features of V_2 can be deleted at the initial site, and then, those of $V_1 + V_2$ can be deleted also at the initial site.

The situation with the Edo (40), however, is different. If deletion of phonetic features applies immediately after incorporation, then the incorporation of V_2 into V_1 yields (45a).

- (45) a. [... $[V_1 + \cancel{V_2}]$... V_2 ...]
 b. [... $v + [V_1 + \cancel{V_2}]$... $[V_1 + \cancel{V_2}]$... V_2 ...]
 c. [... $v + [V_1 + \cancel{V_2}]$... $[\cancel{V_1} + \cancel{V_2}]$... V_2 ...]

Then, $V_1 + \cancel{V_2}$ incorporates into v as in (45b), and its phonetic features are deleted at the initial site as in (45c). Hence, if this derivation is allowed, (40) should be grammatical. On the other hand, a different result obtains if deletion of phonetic features applies after the completion of the vP phase. Consider the configuration in (43) again, repeated here as (46a).

- (46) a. [... $v + [V_1 + V_2]$... $[V_1 + V_2]$... V_2 ...]
 b. [... $v + [V_1 + V_2]$... $[V_1 + \cancel{V_2}]$... V_2 ...]

c. [... v + [V₁+V₂] ... [~~V₁~~+V₂] ... V₂ ...]

As the incorporation of V₂ is covert, its phonetic features must be deleted at the landing site. This yields (46b). But then, a problem arises with the chain (V₁+V₂, V₁+~~V₂~~). First, the two members of the chain are not identical with respect to phonetic features, and this by itself may cause a problem for the deletion operation. But even if the operation successfully applies, (46c) is derived with the phonetic features of V₂ remaining at the landing site. Note that the same problem arises even if deletion applies to the (V₁+V₂, V₁+V₂) chain first. In this case, the deletion directly yields (46c) from (46a). Since the leftmost V₂ in the v position and the rightmost V₂ at the initial site do not form a chain, there is no way to delete the former. Thus, the ungrammatical examples in (38) cannot be derived, a desirable result.¹²

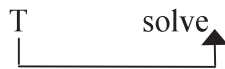
It was shown above that the difference in (38) and (39) between Edo and Chinese can be successfully captured if deletion of phonetic features takes place upon the completion of phase. The contrast between (38) and (39), then, provides evidence that the deletion of phonetic features applies in this way. The mechanism is conceptually motivated as well, as long as the deletion of phonetic features is part of the Transfer Operation that sends information to the C-I and S-M interfaces.

Before I conclude this section, I would like to point out an implication for the analysis of V-T merger in Japanese. It is generally assumed that there are two distinct ways for V to merge with T, by incorporation of V to T as in (47a) and by phonological merger (or affix hopping in the sense of Chomsky 1957) as in (47b).

(47) a. John is quickly solving the problem



b. Mary quickly solved the problem

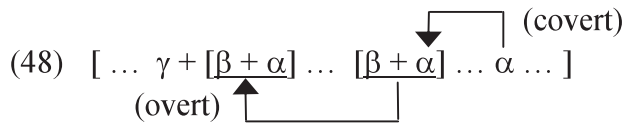


Only auxiliary verbs and *be*-verbs take the first option in English, but as first observed by Emonds (1978), the option is widespread cross-linguistically. At the same time, it has not been clear which option Japanese employs because the language is strictly head-final, and adverbs, for example, cannot right-adjoin to any phrase. As nothing can intervene between V and T in Japanese, it is difficult to find evidence that distinguishes the two options.

But the discussion in this section implies that Japanese resorts to phonological merger. The

¹² A question arises as to why (46c) itself is not allowed with two copies of V₂ pronounced. I assume here that this is ruled out by an independent principle that restricts the realization of phonetic features at two positions.

account for the ungrammaticality of the Edo examples in (38), as illustrated in (46), implies that a covert incorporation cannot be followed by an overt incorporation in the way shown in (48).¹³



With this in mind, let us consider again the example of the light verb construction in (24), repeated here as (49).

- (49) Hanako-ga Taroo-ni [_{NP}toti -no zyooto]-o si-ta
 Hanako-NOM Taroo-DAT land-GEN giving-ACC do-Past

‘Hanako gave a piece of land to Taroo.’

According to the analysis presented in Section 3, *zyooto* ‘giving’ covertly incorporates into *su* ‘do’, and makes the merger of the goal argument *Taroo* possible. If *su* is to eventually move to T, it must first overtly incorporate into *v* so that it is located at the phase edge of *v*P. But this is excluded because it creates the illegitimate configuration in (48). It follows then that phonological merger is the only option for the merger of *su* ‘do’ and *ta* ‘Past’ in this case.

6. Conclusion

In this paper, I examined the roles of selectional restrictions and the interpretive mechanism of incorporation chains in the formation of complex predicates. Given the theory of Merge in Chomsky (2012), the operation applies freely in the construction of phrase structure. Then, much burden is placed on selection to distinguish legitimate and illegitimate derivations. I first argued in Section 2 that Kageyama’s (1993) transitivity harmony principle on Japanese lexical complex predicates can be derived from the selectional relation between *v* and V. This showed that the selectional requirements of *v* constrain the possible forms of complex predicates. Then, I examined the Japanese light verb construction and the Edo serial verb construction in Section 3, and concluded that selectional requirements constrain the application of Merge rather than the resulting phrase structure. In Section 4, I briefly reviewed the discussion in Huang (2006) on Chinese resultatives. In particular, I introduced his argument that phrasal resultatives, as opposed to compound resultatives, are subject to the object restriction just like resultatives in Edo. Based on this, I concluded that the unique properties of

¹³ The account implies more generally that covert movement cannot be followed by overt movement whether the movement is incorporation or not. Overt movement, by definition, retains the phonetic features at the landing site. Given this, if the second step of movement is overt, the first step must be as well because otherwise the phonetic features are realized at two positions, the final landing site and the initial site. It is probably of some interest that overt movement must precede covert movement even in a single-cycle model.

compound resultatives in Chinese are due to the fact that they employ compounds. Finally, in Section 5, I suggested an analysis for the difference between the Chinese compound resultatives and the Edo serial verb resultatives with respect to the object restriction. The analysis provided empirical support for the conceptually motivated assumption that the deletion of phonetic features, which distinguishes covert and overt movements, applies upon the completion of a phase as part of the Transfer Operation to the interfaces.

As noted at the outset of this paper, Japanese lexical complex predicates, Edo resultative serial verbs, and Chinese compound verbs all exhibit different properties. I argued that no “language-specific principles” are necessary to account for those differences. The three types of complex predicates are formed differently. Japanese lexical complex predicates are formed before they are merged into a larger syntactic structure. Edo resultative serial verb construction involves covert incorporation. And I entertained the possibility that Chinese compound verbs are formed by overt incorporation. I argued that given this, the theories of selection and chain interpretation explain the different properties these three constructions exhibit.

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Case and Labeling in a Language without ϕ -feature Agreement*

Mamoru Saito

1. Introduction

Among the characteristic properties of the Japanese left periphery are the occurrences of multiple subjects and other constituents preposed by semantically-vacuous scrambling. Examples of multiple subjects and scrambling are shown in (1).

- (1) a. Bunmeikoku-ga dansei-ga heikinzyumyoo-ga mizika-i (Kuno 1973)
civilized.country-NOM male-NOM average.life.span-NOM short-Pres.
'It is in civilized countries that the male average life span is short.'
- b. Dono hon-o minna-ga [_{CP} Hanako-ga / eran-da ka] sir-ita-gat-te i-ru
which book-ACC all-NOM Hanako-NOM select-Past Q want.to.know-Pres.
'Everyone wants to know which book Hanako selected.'

I suggest in this paper that these two phenomena are related to the absence of ϕ -feature agreement in the language.

Kuroda (1988) proposes that one of the fundamental properties of Japanese is the absence of obligatory agreement. This hypothesis has been developed in more recent works such as Saito (2007) and Şener and Takahashi (2010). They argue that Japanese lacks ϕ -feature agreement altogether. On the other hand, Chomsky (2000, 2008) proposes that Case is required for and valued through ϕ -feature agreement. These two lines of

research raise questions on the nature of Case in Japanese. How is it valued? What is its function in syntactic derivation? The main purpose of this paper is to address these questions.

First, given that Japanese lacks ϕ -feature agreement, Case in this language cannot be valued through it. I argue that an unvalued Case feature directly probes its value assigner, along the lines proposed in Bošković (2007). This makes the correct predication that Japanese allows multiple occurrences of the same Case. Secondly, Case in Japanese does not serve to accommodate ϕ -feature agreement. I present a hypothesis that it is instead required for labeling. Chomsky (2012) discusses the labeling algorithm (LA) for the syntactic objects in (2) formed by Merge.

- (2) a. {H, β P}
- b. { α P, β P}
- c. {H, H}

The case in (2a) is straightforward. As internal search immediately finds a unique head H, the syntactic object assumes its label. The LA for (2b) and (2c) is not trivial. Given the fact that syntactic objects with Case never project, I hypothesize that Case in Japanese has the function of making a phrase invisible to LA. If α P accompanies Case in (2b), β P provides the label for the whole constituent as α P is invisible. I show that an immediate consequence of this hypothesis is that Japanese allows DP scrambling.

In the following section, I first briefly go over the argument in Saito (2007) that Japanese lacks ϕ -feature agreement. More specifically, I discuss the claim that the language allows argument ellipsis because of the absence of ϕ -feature agreement. Then, I adopt Bošković's (2007) proposal that Case valuation takes place independently of ϕ -feature agreement and show that it accounts for examples of multiple subjects as in (1a). Section 3 concerns the function of Case in Japanese. I argue that it is to make a phrase invisible to LA as noted above, and show that this hypothesis explains why scrambling is possible in Japanese. Sections 4 and 5 extend the analysis of Japanese Case to other phenomena. An (2009) proposes that genitive Case in Korean (and Japanese) is not Case in the regular sense, but should be considered a prenominal inflection on DPs and PPs. Building on this proposal, I argue that prenominal/preverbal inflections of predicates have the same function as Case, and make predicates invisible to LA. This leads to an explanation for the properties of lexical complex verbs in Japanese, which are discussed extensively in Kageyama (1993). I argue that they are formed in the syntax by the merger of two verbs as in (3), instantiating the case in (2c).

(3) {V-inflection, V}

In Section 5, I speculate on the source of the head-final structure of Japanese. I show that the discussion in this paper leads to the expectation that the “base” structure in languages with ϕ -feature agreement is head-initial while that in languages without can be head-final. Section 6 concludes the paper.

2. Case Valuation without ϕ -feature Agreement

In this section, I first discuss the analysis of argument ellipsis proposed in Saito (2007) and Şener and Takahashi (2010), and motivate the assumption that Japanese lacks ϕ -feature agreement. Then, I present a valuation mechanism for Case in Japanese based on proposals in Bošković (2007).

The discovery of argument ellipsis in Japanese/Korean is due to Oku (1998) and Kim (1999). It had been assumed since Kuroda (1965) that null objects are observed in Japanese because the language allows *pro* in any argument position. However, Otani and Whitman (1991) noted that null objects in Japanese allow sloppy interpretation as illustrated in (4a-b).

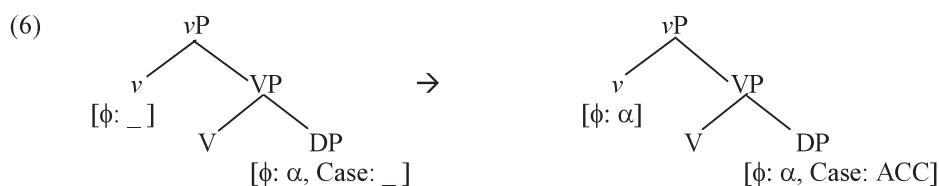
- (4) a. Taroo-wa itumo zibun-no hakaseronbun-o inyoosu-ru
Taroo-TOP always self-GEN dissertation-ACC cite-Pres.
'Taroo always cites his Ph.D. dissertation.'
- b. Demo, hoka-no hito-wa zenzen [e] inyoosi-na-i
but other-GEN person-TOP at.all cite-not-Pres.
'But the others don't cite (it / their Ph.D. dissertations) at all.' ... strict or sloppy interpretation
- c. Demo, hoka-no hito-wa zenzen sore-o inyoosi-na-i
but other-GEN person-TOP at.all it-ACC cite-not-Pres.
'But the others don't cite it at all.' ... strict interpretation only

Only strict interpretation is possible with pronouns as shown in (4c). Then, the *pro* analysis fails to account for the sloppy interpretation of (4b). Given this, Otani and Whitman (1991) proposed that the sloppy interpretation of (4b) arises from VP-ellipsis. Their analysis is that V moves out of the VP to T, and the remnant VP, which contains only the object, is elided. What Oku (1998) and Kim (1999) observed is that there are null arguments that allow sloppy interpretation but cannot be accounted for by VP-ellipsis. For example, Oku points out that sloppy interpretation is possible with null subjects as well. One of his examples is shown in (5).

- (5) a. Hanako-wa [CP[TP[zibun-no teian]-ga saiyoos-are-ru] to] omot-te i-ru
 Hanako-TOP self-GEN proposal-NOM accept-Pass.-Pres. COMP think-Pres.
 ‘Hanako thinks that her proposal will be accepted.’
- b. Demo, Taroo-wa [CP[TP[e] saiyoos-are-ru] to] omot-te i-na-i
 but Taroo-TOP accept-Pass.-Pres. COMP think-not-Pres.
 ‘But Taroo doesn’t think that her/his proposal will be accepted.’ ... strict or sloppy interpretation

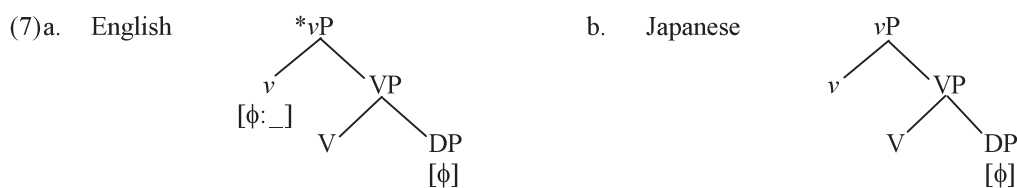
Based on observations of this kind, both Oku (1998) and Kim (1999) proposed that Japanese/Korean allows arguments to be elided.

If this is correct, then it must be investigated why Japanese/Korean has this peculiar property. Building on Oku (1998) and Shinohara’s (2006) arguments that elided arguments are interpreted by LF-copying, Saito (2007) relates argument ellipsis to the absence of ϕ -feature agreement. The analysis is based on Chomsky’s (2000, 2008) mechanism for ϕ -feature agreement. A head with unvalued ϕ -features probes for and agrees with a DP that provides the needed values. (6) illustrates this with v .



v agrees with the DP and receives the ϕ -feature set of the DP. Crucial in this process is the activation condition that requires the DP to have an unvalued feature of its own to qualify as a goal in the agree relation. In (8), the DP has an unvalued Case feature, and the feature is valued as ACC by virtue of the agree relation with v . According to this system, Case on DPs accommodates ϕ -feature agreement and is valued through ϕ -feature agreement.

If ϕ -feature agreement takes place as illustrated above, then argument ellipsis should be illicit. Let us assume that LF-copying involves copying of an LF object from the preceding discourse, following William’s (1977) analysis of VP-ellipsis.¹⁾ Then, LF copying of a DP in the object position should yield (7a).



A DP from the preceding discourse should have its Case feature valued already. As it is plausible that a valued Case feature is transferred to the A-P but not to the C-I interface, I assume that the DP lacks Case altogether. But whether the DP has a valued Case feature or lacks the feature is not crucial. Either way the DP fails to participate in agree relation with v because of the activation condition, and as a result, the ϕ -features of v cannot be valued. Consequently, LF copying of an argument inevitably leads the derivation to crash. This accounts for the absence of argument ellipsis in ϕ -feature agreement languages.

Then, why is argument ellipsis possible in Japanese/Korean? Let us suppose that these languages lack ϕ -feature agreement, a plausible assumption as these languages exhibit no overt agreement phenomena. Then, v in these languages does not have ϕ -features to be valued as shown in (7b). In this case, LF-copying of a DP into the object position causes no problem. The copied DP does not qualify as a goal for ϕ -feature agreement. But as v has no ϕ -features to be valued, this is irrelevant. Thus, the absence of ϕ -feature agreement makes argument ellipsis possible.

The analysis of argument ellipsis outlined above raises questions about the valuation mechanism and the function of Case in Japanese. Recall that according to Chomsky (2000, 2008), Case is required for ϕ -feature agreement because of the activation condition, and is valued through ϕ -feature agreement. That is, Case is part of ϕ -feature agreement. Given this, it is assumed in most recent works on Japanese Case, such as Ura (1999), Hiraiwa (2001) and M. Takahashi (2010), that there is ϕ -feature agreement in the language at least abstractly. In this paper, I maintain the analysis of argument ellipsis in terms of the absence of ϕ -feature agreement, and pursue an alternative account for Case in Japanese. I discuss its valuation mechanism in the remainder of this section and discuss its function in derivation in Section 3.

First, aside from the theory-internal argument based on the analysis of argument ellipsis, there is suggestive and yet direct evidence that Case valuation in Japanese is independent of ϕ -feature agreement. That is, there are contexts where Case is required on PPs. For example, PP subjects are widely observed and they must accompany nominative Case as (8) illustrates.

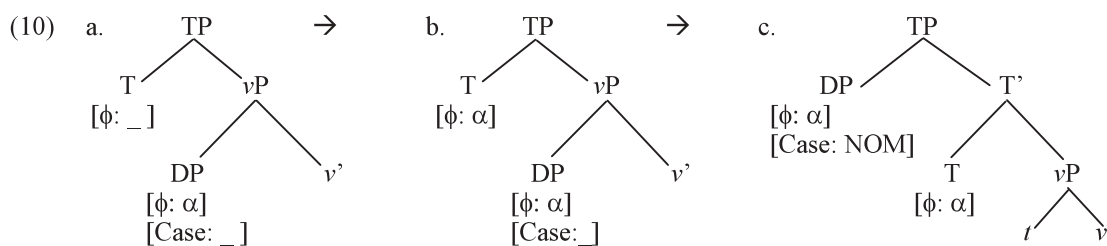
- (8) a. Koko-kara-ga huzi-san-ni nobori-yasu-i
 here-from-NOM Mt. Fuji-DAT climb-easy-Pres.
 ‘It is from here that one can easily climb Mt. Fuji.’
- b. Go-zi-made-ga untin-ga yasu-i
 5-o’clock-to-NOM fare-NOM cheap-Pres.
 ‘It is up to 5 o’clock that the fare is cheap.’

Further, PPs must have genitive Case within a nominal projection whether they are arguments or adjuncts. This is shown in (9).

- (9) a. Taroo-no tomodati-to-no Yooroppa-e-no ryokoo
 Taroo-GEN friend-with-GEN Europe-to-GEN trip
 ‘Taroo’s trip to Europe with friends’
- b. Hanako-no muitimon-de-no tookyoo-kara-no syuppatu
 Hanako-GEN no.penny-with-GEN Tokyo-from-GEN departure
 ‘Hanako’s departure from Tokyo without any money’

This suggests that Case is valued in the absence of ϕ -feature agreement as PPs lack inherent ϕ -features.

A proposal to divorce Case valuation from ϕ -feature agreement, on general grounds, is made in Bošković (2007). The facts in (8)-(9), then, can be taken as supporting evidence for this proposal. Bošković maintains that a feature is uniformly valued on the probe in probe-goal relation with the value-provider. The valuation of nominative Case is illustrated in (10).

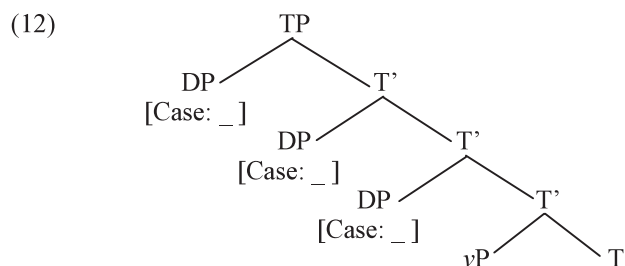


First, T with unvalued ϕ -features probes a DP and has its ϕ -features valued as in (10b). Then, the DP with an unvalued Case feature moves to TP Spec, where it can probe T and obtain nominative, as in (10c). This mechanism of Case valuation is directly applicable to Japanese, which by hypothesis lacks ϕ -feature agreement.

Bošković’s (2007) analysis of Case valuation not only accounts for Case on PPs but has an additional desirable consequence. As can be seen in (8) and (9), multiple occurrences of the same Case are observed extensively in Japanese. Kuno’s (1973) celebrated example of multiple subjects in (1a) is repeated in (11).

- (11) Bunmeikoku-ga dansei-ga heikin-zyumyoo-ga mizika-i
 civilized.country-NOM male-NOM average-life.span-NOM short-Pres.
 ‘It is in civilized countries that male’s average life span is short’

This follows straightforwardly. As illustrated in (12), each DP with an unvalued Case feature can probe T, which provides nominative. Consequently, multiple occurrences of nominative are expected.



Note that if nominative is valued as a result of T probing a DP for ϕ -feature values, only a single DP is expected to obtain nominative. This problem can be circumvented by Hiraiwa's (2001) mechanism of multiple-agree, which allows a single probe to enter into Agree relation simultaneously with multiple goals. But Bošković's (2007) proposal provides a much more straightforward analysis at least for the relevant examples in Japanese.

Two remarks are in order before I close this section. First, Bošković (2007) proposes to eliminate the activation condition. This is necessary for Case valuation: In (10c), T has no unvalued feature when DP probes it and obtains nominative. On the other hand, the activation condition on ϕ -feature agreement played a crucial role in the analysis of argument ellipsis presented earlier in this section. Given this situation, I tentatively assume that only ϕ -feature agreement is subject to this condition. Secondly, Bošković's analysis of Case predicts that multiple nominative should be possible, for example, in English as well. I take up this potential problem in the following section and argue that multiple occurrences of Case are ruled out on independent grounds in English.

3. Case and Labeling

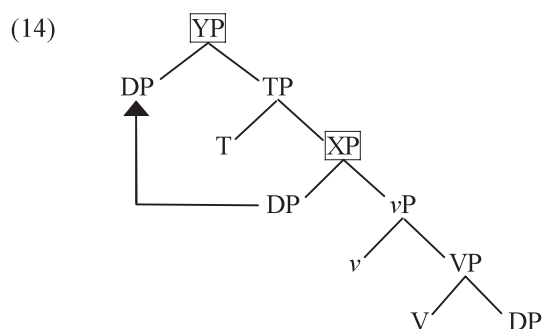
This section concerns the function of Case in Japanese. As I continue to assume the activation condition for ϕ -feature agreement, it is possible to maintain Chomsky's (2000, 2008) proposal that Case in English is required for ϕ -feature agreement. On the other hand, if Japanese lacks ϕ -feature agreement, the function of Case in this language must be sought elsewhere. In this section, I pursue the possibility that Case in Japanese serves to accommodate labeling. I first discuss Chomsky's (2012) proposals on labeling and then explore the function of Case in Japanese.

One of the main purposes of Chomsky (2012) is to discuss the algorithm to decide the labels of the

syntactic objects formed by Merge. He considers the three cases in (13).

- (13)a. {H, αP }
- b. { αP , βP }
- c. {H, H}

The case in (13a), according to Chomsky (2012), is straightforward. Among the two elements is a unique head, and that head, one can assume, provides the label for the object. On the other hand, the cases in (13b-c) are more complex. Chomsky (2012) considers concrete instances of (13b) and makes a few proposals. Let us take the TP structure in (14) as an example.

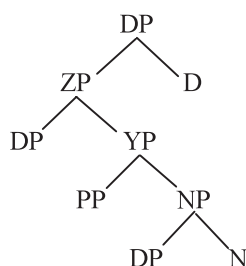


As the structure is constructed bottom-up, the case in (13b) arises first with the merger of DP and vP . In this case, the DP moves later to merge with TP. Chomsky proposes that this movement makes vP the only element that is properly and immediately contained within $\{DP, vP\}$, and hence, the syntactic object assumes the label of vP as its own.²⁾ This accounts for the labeling of XP, but the same problem arises when the DP is merged with TP. For this, Chomsky appeals to feature sharing. The DP and (the label of) TP share the ϕ -feature values because of prior ϕ -feature agreement. He proposes that the label of YP is successfully determined due to this feature sharing. Labeling by feature sharing extends to cases of operator movement to CP. For example, when a wh-phrase moves and merges with an interrogative CP, the label of the formed object can be determined based on the fact that the wh-phrase and the interrogative C share the interrogative feature, say, Q.

Although this labeling algorithm is yet to be worked out in full detail, let us assume that it covers cases of (13b) that arise in English and other ϕ -feature agreement languages. Still an additional proposal is required for languages like Japanese. For example, if Japanese lacks ϕ -feature agreement, the label of YP in (14) cannot be

determined on the basis of ϕ -feature sharing. Another potentially problematic example is shown in (15).

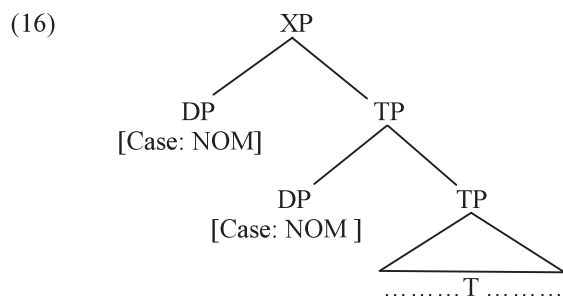
- (15) Taroo-no yooroppa-e-no hon-no yuusoo
 Taroo-GEN Europe-to-GEN book-GEN shipment
 ‘Taroo’s shipment of books to Europe’



In this example, three arguments are merged with N.³⁾ The mergers of the goal PP and the agent DP create the configuration in (13b).

Given the hypothesis that Japanese lacks ϕ -feature agreement, I would like to entertain the possibility that Case in Japanese plays a role similar to that of ϕ -feature agreement in the accommodation of labeling. One clear generalization is that a phrase with Case never projects. I propose then that the function of Case in Japanese is to make a phrase invisible for labeling. This makes the merger of the subject DP as in (14) unproblematic even in the absence of ϕ -feature agreement. As the subject DP has nominative, it never provides the label whether it is merged with ν P or TP. Also, the three arguments in (15) are all in genitive. Thus, only NP is visible in the labeling of YP, and only YP in the labeling of ZP.

Although the proposal just made may seem somewhat simplistic, it has two desirable consequences. First, it makes the analysis of multiple occurrences of Cases in the preceding section complete. Recall that Japanese allows multiple nominative subjects, for example. It was shown in the preceding section that Bošković’s (2007) proposal on Case valuation accounts for this. At the same time, it was noted that it remains to be explained why similar examples are not observed in English. The proposal just made on the function of Case in Japanese provides an answer. Let us consider the configuration in (16).



In both Japanese and English, the Cases on the DPs can be valued nominative. However, a problem arises with the labeling of XP in English. The TP formed by the merger of the lower DP and TP can be labeled based on ϕ -feature sharing. The ϕ -features of T are valued by this DP, and hence, feature sharing obtains. However, XP fails to be labeled as there is no ϕ -feature agreement between the higher DP and T. Thus, multiple subjects should be illicit in English. On the other hand, the labeling of XP is straightforward in Japanese. By hypothesis, the nominative Case of the higher DP makes this DP invisible for labeling. Then, the higher TP provides the label for XP, and consequently, multiple subjects are possible in the language.

Secondly, the hypothesis on the function of Japanese Case leads to an answer for a long-standing question, that is, why scrambling is possible in the language. I discuss DP scrambling first as it follows directly from the hypothesis, and return to scrambling of other types of constituents later in the section.

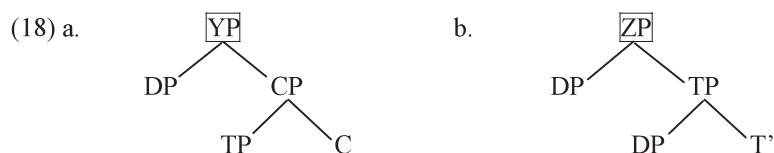
Although there are many analyses of scrambling entertained in the literature, one of its clear properties is that it can be non-A, non-operator movement. The following examples illustrate this property:⁴⁾

- (17)a. Minna-ga [_{CP}Hanako-ga dono hon-o eran-da ka] sir-ita-gat-te i-ru
 all-NOM Hanako-NOM which book-ACC choose-Past Q want.to.know-Pres.
 ‘Everyone wants to know which book Hanako chose.’
- b. Dono hon-o monna-ga [_{CP}Hanako-ga *t* eran-da ka] sir-ita-gat-te i-ru

(17a) is a straightforward example with an embedded question. In (17b), the wh-phrase *dono hon-o* ‘which book-ACC’ is scrambled to the initial position of the matrix clause. The grammaticality of the example indicates that scrambling is non-A movement as the movement is in clear violation of the locality for A-movement. At the same time, it shows that scrambling does not target an operator position because the scrambled wh-phrase takes scope in the embedded clause. If the landing site of scrambling is an operator position, the scrambled phrase is expected to stay there for interpretation. Then, scrambling should not involve any kind of feature sharing,

whether it is a sharing of ϕ -features or an operator/clause-type feature.

Given this, let us consider the structures that DP scrambling creates at the edges of CP and TP.



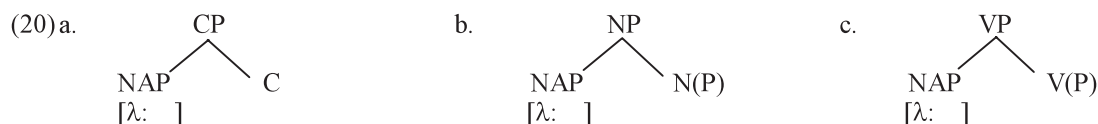
A DP is merged with a CP in (18a) and with a TP in (18b). As there is no feature sharing, YP and ZP fail to be labeled and the structures are ruled out. This is the correct result for English and other languages that do not allow scrambling. However, the situation is different in the case of Japanese. The scrambled DPs have Case features that make them invisible for labeling. Then, YP inherits the label of CP and ZP that of TP. Thus, scrambling is predicted to be possible in Japanese.

The hypothesis that Case in Japanese makes a phrase invisible for labeling suggests that it is fundamentally different from Case in ϕ -feature agreement languages. In this respect, the hypothesis fits well with An's (2009) proposal that genitive in Korean is not a Case but serves to create prenominal forms of DPs and PPs. Predicates in Korean take different forms depending on the contexts of their occurrences. Among them is the prenominal form. An's proposal is that DPs and PPs also have prenominal forms, i.e., their genitive forms. In Japanese also, predicates have conclusive, prenominal and preverbal forms, for example. Although the surface distinction between the conclusive and prenominal forms is mostly lost in modern Japanese, the full paradigm can still be observed with nominal adjective phrases (NAPs), which are formed with property-denoting nouns and the copula. Thus, *sizuka*-copula 'be quiet' takes distinct conclusive, prenominal and preverbal forms as in (19).

- (19)a. Kono heya-wa sizuka-da
 this room-TOP quietness-Cop.
 'This room is quiet'
- b. sizuka-na heya
 quietness-Cop. room
 'a quiet room'
- c. Taroo-wa sizuka-ni kaet-ta
 Taroo-TOP quietness-Cop. leave-Past
 'Taroo left quietly'

Note that the phrases headed by those inflected predicates never project, just like DPs and PPs with Case. Then, it is plausible that inflection on predicates and Case have a common feature, say, λ , that makes a phrase invisible for labeling. λ is realized as Case on DPs/PPs and as inflection on predicates.

It would be useful to consider the concrete mechanism for the valuation of λ here. Let us first take λ on NAPs. NAPs may merge with C, N(P) and V(P), for example, as in (20).



As an NAP always has the λ -feature, it never contributes to the labeling of the formed constituent. The NAP in (20a) probes C, and the λ -feature is valued as conclusive (*da*). In (20b), the λ -feature is valued as prenominal (*na*) because the NAP probes N. Finally, in (20c), the NAP probes V, which results in the preverbal (*ni*) value for λ . A similar mechanism can be assumed for Case. Relevant configurations are shown below.



Again, λ aids labeling by making phrases invisible just as in (20). However, its value is realized as Case when it is on DP/PP as in (21). When the DP/PP probes T, λ is valued as nominative. When it probes N, the value is genitive. And finally, when a DP probes a (transitive) verb as in (21c), λ is valued as accusative. I assume here that PPs within VP carry λ -feature as well, and it is valued as \emptyset . That is, PPs are always Case-marked whether they are within NP or VP.⁵⁾

The extension of the analysis of Case outlined above makes the account for scrambling complete. Scrambling is not limited to DPs. PPs and NAPs, for example, are also subject to scrambling as shown in (22).

- (22) a. Rondon-kara Hanako-ga *t* modot-ta
 London-from Hanako-NOM return-Past
 ‘Hanako returned from London.’
 b. Sizuka-ni Taroo-ga *t* kaet-ta
 quietness-Cop. Taroo-NOM leave-Past
 ‘Taroo left quietly.’

The labeling of the constituents formed by these scramblings is no longer a problem, given the analysis outlined above. PPs and NAPs have the λ -feature, which make them invisible for labeling.

It was argued in this section that merger of the form $\{\alpha P, \beta P\}$ is widely observed in Japanese because Case, and more generally the λ -feature, accommodates the required labeling. In the following section, I argue that there is also a case of $\{H, H\}$ that is made possible by the λ -feature.

4. Lexical Complex Verbs and the Transitivity Harmony

Kageyama (1993) demonstrates that there is a class of compound verbs in Japanese, which he calls ‘lexical complex verbs’, that exhibit the following generalization:

- (23) The transitivity harmony principle: In a lexical complex verb V_1+V_2 , V_1 and V_2 must be consistent in the presence/absence of external argument.

(23) says that if one of the component verbs in a lexical complex verb is unaccusative, so should be the other one. The contrast in (24) instantiates the generalization.

- (24)a. Hanako-ga Taroo-o osi-taosi-ta
 Hanako-NOM Taroo-ACC push-make.fall-Past
 ‘Hanako pushed Taroo and made him fall.’
- b. *Taroo-ga kuzira-o ukabi-mi-ta
 Taroo-NOM whale-ACC float-see-Past
 ‘A whale came to the surface and Taroo saw it.’

(25) lists lexical complex verbs that conform to (23), and (26) those that do not.

- (25)a. transitive-transitive: *hiki-nuk* (pull-pull.out), *nigiri-tubus* (grasp-crash), *tataki-otos* (knock-drop),
kiri-tor (cut-remove), *uke-tome* (receive-catch)
- b. unergative-unergative: *hasiri-yor* (run-go.close.to), *tobi-ori* (jump-go.down), *kake-nobor* (run-climb),
aruki-mawar (walk-go.around), *mure-tob* (form.a.flock-fly)
- c. unaccusative-unaccusative: *suberi-oti* (slip-fall), *ukabi-agar* (float-rise),
umare-kawar (be.born-change), *huri-sosog* (fall-flow)

- d. transitive-nergative: *moti-aruk* (carry-walk), *sagasi-mawar* (look.for-go.around),
mati-kamae (wait-hold)
- e. nergative-transitive: *naki-haras* (cry-make.swollen), *nori-kaer* (ride-change),
nomi-tubus (drink-waste), *odori-akas* (dance-stay.up.all.night)
- (26) a. unaccusative-transitive: **ukabi-mi* (float-see), **oti-kakus* (fall-hide)
- b. transitive-unaccusative: **osi-taore* (push-fall), **nomi-yow* (drink-get.drunk)
- c. nergative-unaccusative: **asobi-oti* (play-fall), **hasiri-korob* (run-tumble)
- d. unaccusative-nergative: **oti-ori* (fall-go.down), **nagare-oyog* (be.carried-swim)

The generalization in (23) raises an interesting question. Kageyama (1993) notes that it is not observed universally and presents it as a language-specific constraint. The following examples from Huang (1992) show that the generalization does not apply to Chinese compound verbs:

- (27) a. Ta he-zui (jiu) le
 he drink-get.drunk wine Asp.
 ‘He drank (wine) and got drunk’
- b. Ta qi-lei-le lianpi ma
 he ride-tired-Asp. two horse
 ‘He rode two horses and got them tired’

At the same time, it is hard to imagine that Japanese-speaking children acquire (23) as a constraint through experience. (23), then, must be a consequence of a specific property of lexical complex verbs in Japanese. In this section, I suggest that the relevant property is that those compound verbs are formed in the syntax by direct merger of two verbs. Then, I argue that this kind of complex verb formation is possible in Japanese precisely because the first verb has the λ -feature.

Before starting to analyze lexical complex verbs, let me first briefly go over Kageyama’s (1993) classification of Japanese complex verbs into three types. The first type is called syntactic complex verbs and is instantiated by the examples in (28).

- (28) a. Hanako-ga Taroo-ni wani-o tabe-sase-ta
 Hanako-NOM Taroo-DAT alligator-ACC eat-make-Past
 ‘Hanako made Taroo eat alligator meat.’

- b. Taroo-ga wani-o tabe-hazime-ta
 Taroo-NOM alligator-ACC eat-start-Past
 ‘Taroo started to eat alligator meat.’

Although these examples contain a single compound verb, each component verb of the compound projects an independent VP syntactically. Kageyama uses the *soo s* ‘do so’ substitution test to demonstrate this. *Soo s* stands for a VP (or a V’) and can substitute for *wani-o tabe* ‘alligator-ACC eat’ in (28) as in (29).

- (29)a. Hanako-ga Taroo-ni soo s-ase-ta
 Hanako-NOM Taroo-DAT so do-make-Past
 ‘Hanako made Taroo do so.’
- b. Taroo-ga soo si-hazime-ta
 Taroo-NOM so do-start-Past
 ‘Taroo started to do so.’

This shows that *tabe* ‘eat’ in (28) projects a VP of its own.

On the other hand, *soo s* ‘do so’ cannot be employed in this way with lexical complex verbs. This is shown in (30)-(31).

- (30)a. Hanako-ga Taroo-o osi-taosi-ta
 Hanako-NOM Taroo-ACC push-make.fall-Past
 ‘Hanako pushed Taroo and made him fall.’
- b. *Hanako-ga (Taroo-o) soo si-taosi-ta
 Hanako-NOM Taroo-ACC so do-make.fall-Past
- (31)a. Taroo-ga suberi-oti-ta
 Taroo-NOM slip-fall-Past
 ‘Taroo slipped and fell.’
- b. *Taroo-ga soo si-oti-ta
 Taroo-NOM so do-fall-Past

Given this, Kageyama (1993) concludes that lexical complex verbs are formed in the lexicon and they enter syntactic derivations just like monomorphemic verbs.

Finally, Kageyama (1993) notes that there is another kind of lexical compound verbs, which I call LCS-based compounds. Lexical complex verbs as in (30) and (31) consist of verbs with predicate-argument

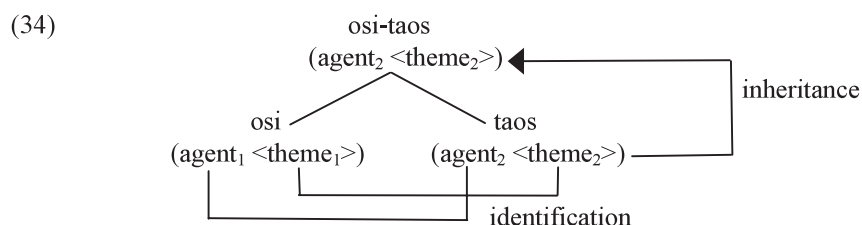
structures of their own. For example, *suber* ‘slip’ and *oti* ‘fall’ in (31a) can appear by themselves as main verbs. The situation is different with the compound verbs in (32).

- (32)a. Hanako-ga Taroo-o heya-ni oi-kon-da
 Hanako-NOM Taroo-ACC room-in chase-KOM-Past
 ‘Taroo was chased by Hanako into the room.’
- b. Taroo-ga kawa-ni tobi-kon-da
 Taroo-NOM river-to jump-KOM-Past
 ‘Taroo jumped into the river.’
- c. Osensui-ga umi-ni nagare-kon-da
 contaminated.water-NOM ocean-to flow-KOM-Past
 ‘Contaminated water flowed into the ocean.’

The second component of the compound verbs in (32), *kom*, is not used as an independent verb but just adds to the meaning of the first verb.⁶⁾ The sentences describe events in which a person or an object moves. *Kom* indicates that the person or the object moves to the place specified in the PP headed by *ni*. Thus, Taroo moves into the room in (32a), Taroo into the river in (32b), and the contaminated water into the ocean in (32c). Kageyama (1993) states that the function of *kom* is to add to the lexical-conceptual structure of the verb it attaches to.

Lexical complex verbs, as noted above, consist of two verbs that have argument structures of their own. Kageyama (1993) analyzes them with the operation of argument identification, which is illustrated in (34) for *osi-taos* ‘push-make.fall’ in (24a) repeated below in (33).

- (33) Hanako-ga Taroo-o osi-taosi-ta
 Hanako-NOM Taroo-ACC push-make.fall-Past
 ‘Hanako pushed Taroo and made him fall.’



The agent and the theme of *osi* ‘push’ are identified with those of *taos* ‘make.fall’, and then the compound

inherits the argument structure of the head *taos*.

Let us now return to the question why lexical complex verbs are subject to the transitivity harmony generalization, repeated in (35).

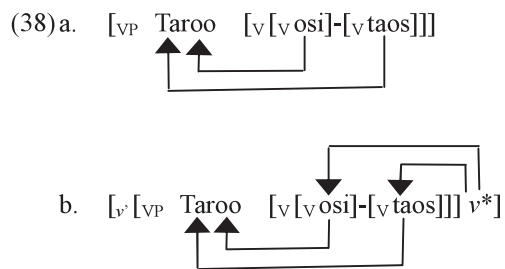
- (35) The transitivity harmony principle: In a lexical complex verb V_1+V_2 , V_1 and V_2 must be consistent in the presence/absence of external argument.

Note first that given (34), *Hanako* is interpreted as the agent and *Taroo* as the theme of both *osi* and *taos* because of argument identification. This suggests that each of V_1 and V_2 in a lexical complex verb V_1+V_2 assigns theta-roles to the argument DPs. In fact, Kageyama (1993) argues that V_1 and V_2 both enter into selectional relations with the arguments. (36)-(37) are slightly modified versions of his examples.

- (36)a. Tuta-ga boo-ni maki-tui-ta
ivy-NOM stick-to wind-attach-Past
'An ivy twined around the stick.'
- b. Abura-ga kabe-ni simi-tui-ta
oil-NOM wall-to soak-attach-Past
'The wall was stained with oil.'
- (37)a. *Tuta-ga boo-ni simi-tui-ta
ivy-NOM stick-to soak-attach-Past
'The stick was stained with a ivy.'
- b. *Abura-ga kabe-ni maki-tui-ta
oil-NOM wall-to wind-attach-Past
'The oil twined around the wall.'

(36a-b) are grammatical because an ivy can twine around a stick and oil can soak into a wall. On the other hand, (37a-b) are ungrammatical because an ivy cannot soak into a stick and oil cannot twine around a wall. This shows that the arguments must satisfy the selectional requirements not only of V_2 but also of V_1 .

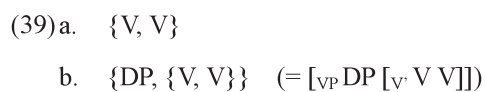
If this observation is correct, both V_1 and V_2 of a lexical complex verb enter into selectional relations with other constituents in the sentence. (38a) illustrates this for (33) with the object *Taroo*.



Further, if V_1 and V_2 individually participate in selectional relations, they must satisfy the selectional requirement of v as well, as illustrated in (38b). Here, it is widely assumed since Chomsky (2000) that v comes in two varieties; v^* selects for transitive/unergative verbs and hosts an external argument while v selects for unaccusative verbs. In (38b), *osi* and *taos* both satisfy the selectional requirement of v^* since both are transitive.

The selectional relation between v^*/v and the component verbs of a lexical complex verb just illustrated yields the transitivity harmony effect directly. Suppose that v^* is merged with a VP headed by a lexical complex verb V_1+V_2 . Then, each of V_1 and V_2 must be transitive or unergative since v^* is in selectional relation with both V_1 and V_2 . On the other hand, if v is employed, V_1 and V_2 must both be unaccusative for the same reason. Thus, the transitivity harmony generalization follows.

As noted above, Kageyama (1993) shows that V_1 and V_2 in lexical complex verbs do not project independent VPs. At the same time, it was just argued that each of V_1 and V_2 enters into selectional relations in the syntax. This is unexpected if lexical complex verbs are formed in the lexicon as Kageyama proposes. This suggests instead that lexical complex verbs are formed in the syntax by direct merger of two verbs as in (39a) and the two verbs together project a single VP, for example, as in (39b).⁷⁾



Then, the question why the transitivity harmony phenomenon is observed widely with Japanese compound verbs reduces to the question why Japanese allows (and employs) this type of complex verb formation. There are two things required for this type of complex verb formation to be possible. First, $\{V, V\}$ must itself be well formed in the syntax. Second, morphology must be able to interpret $\{V, V\}$ as a compound. The morphological form of V_1 provides a clue for both.

V_1 in lexical complex verbs always takes the preverbal form, which is stem+*i*.⁸⁾ Thus, *osi-taos* and *suberi-oti* are more precisely as in (40).

(40) os-i (push) + taos (make.fall), suber-i (slip) + oti (fall)

The relevant form is preverbal as it is identical to the form of the first verb in ν P coordination, for example. This is illustrated in (41).

- (41)a. Taroo-wa [_{VP}suber-i], [_{VP}ana-ni oti]-ta
Taroo-TOP slip hole-in fall-Past
'Taroo slipped and fell into a hole.'
- b. Hanako-wa itumo [_{VP}teeburu-o os-i], [_{VP}kabin-o taos]-u
Hanako-TOP always table-ACC push vase-ACC make.fall-Pres.
'Hanako always pushes the table and make the vase fall.'

(42a) will in fact have the structure in (42b) with a pause between the two verbs.

- (42)a. Hanako-wa itumo [_{VP}Taroo-o os-i-taos]-u
Hanako-TOP always Taroo-ACC push-make.fall-Pres.
'Hanako always pushes Taroo and make him fall'
- b. Hanako-wa itumo [_{VP}Taroo-o os-i], [_{VP}pro taos]-u
Hanako-TOP always Taroo-ACC push make.fall-Pres.

This morphological property of V_1 is shared by LSC compound verbs, which are clearly lexical. (43) illustrates this with some examples from (32).⁹⁾

(43) o-i (chase) + kom, tob-i (jump) + kom

Then, nothing should prevent morphology from interpreting lexical complex verbs as words. Further, and more importantly, the preverbal form of V_1 , according to the discussion in the preceding section, should accommodate the labeling of $\{V, V\}$ in the syntax. Recall that $\{H, H\}$, created by merger of two heads, poses a potential problem for labeling. Then, it can be assumed that the structure is ruled out unless there is some way to determine the label of the constituent. But it was hypothesized in the preceding section that preverbal inflection is a realization of the λ -feature on predicates and that its function is to make a constituent invisible to labeling. (41), for example, has an intermediate structure $\{\nu P, \nu P\}$. The λ -feature on the head of the first νP , which is

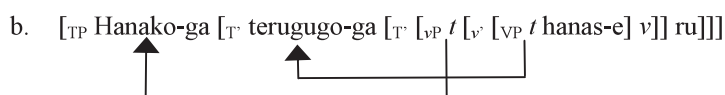
realized as preverbal inflection on the first verb, makes this *vP* invisible for labeling, and consequently, the second *vP* provides the label for the whole structure. In a similar vein, a lexical complex verb has the structure {*V*, *V*} in the syntax, but the λ -feature on the first verb resolves the potential labeling problem. It makes the first *V* invisible and as a result, the second *V* provides the label. If this is correct, it is the λ -feature that allows Japanese to freely form V-V compounds in the syntax by the application of Merge.

5. Speculations on the Head-Final Phrase Structure

So far, I argued that the function of Case in Japanese is to accommodate labeling, and that Case is a realization of the more general λ -feature on DPs and PPs. This led to possible explanations for why the language has scrambling and why it has V-V compounds that are subject to transitivity harmony. In this section, I return to the distribution of Case in Japanese and speculate on the relation between the Case valuation mechanism and the head-final structure.

In Section 2, I adopted Bošković's (2007) proposal that DPs with unvalued Case features probe the value assigners. This implies that a DP with nominative Case has T in its search domain, which is consistent with Koizumi's (1998) proposal that nominative objects move to a position within a projection of T, as illustrated in (44).

- (44)a. Hanako-ga terugugo-ga hanas-e-ru
 Hanako-NOM Telugu-NOM speak-can-Pres.
 'Hanako can speak Telugu'



However, it is argued in Yatsushiro (1999), for example, that nominative objects do not move to a position within a projection of T but instead stay in the object position. This is confirmed by the distribution of floating numeral quantifiers.

Let us first consider the examples in (45)-(46) from Miyagawa (1989).

- (45)a. Gakusei-ga san-nin kono kagi-de doa-o ake-ta
 student-NOM three-Classifier this key-with door-ACC open-Past
 'Three students opened the door with this key.'

b. ??Gakusei-ga kono kagi-de san-nin doa-o ake-ta
 student-NOM this key-with three-Classifier door-ACC open-Past
 ‘Three students opened the door with this key.’

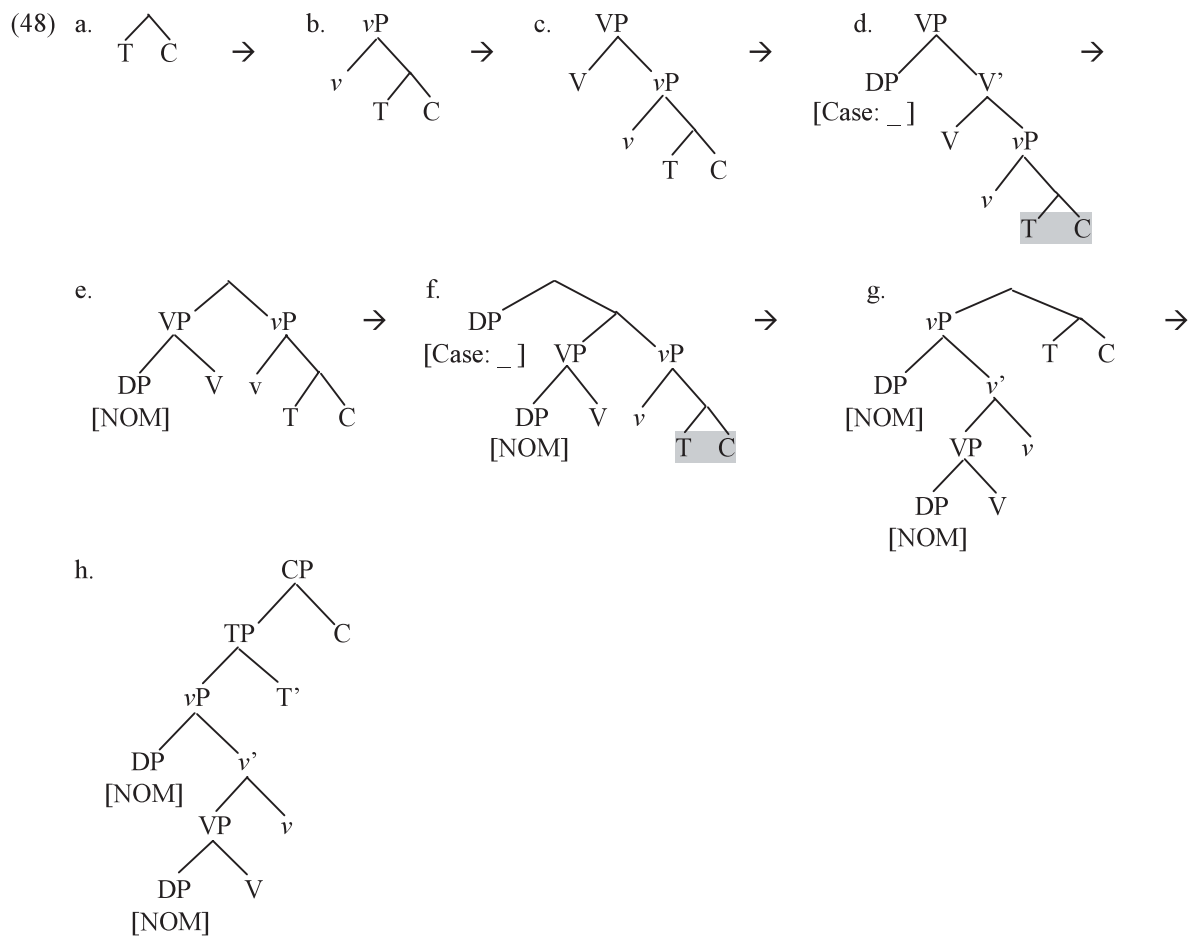
(46) Doa-ga kono kagi-de t mit-tu ai-ta
 door-NOM this key-with three-Classifier open-Past
 ‘Three doors opened with this key.’

In (45), *san-nin* ‘three-Classifier’ modifies *gakusei* ‘student’. The contrast between (45a) and (45b) shows that a numeral quantifier must be adjacent to the noun it modifies. Miyagawa (1989) points out that the grammaticality of (46) provides clear evidence for the unaccusativity hypothesis. Since *ak* ‘open’ is unaccusative, the subject *doa* ‘door’ originates in the object position, that is, a position adjacent to the numeral quantifier. Given this, the contrast between (47a) and (47b) shows that nominative objects do not move as in (44b).

(47)a. Gakusee-ga san-nin terugugo-ga hanas-e-ru
 student-NOM three-Classifier Telugu-NOM speak-can-Pres.
 ‘Three students can speak Telugu’
 b. ??Gakusee-ga terugugo-ga san-nin hanas-e-ru
 student-NOM Telugu-NOM three-Classifier speak-can-Pres.
 ‘Three students can speak Telugu’

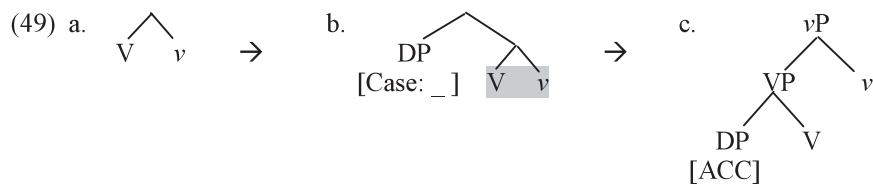
The derivation in (44b) allows *san-nin* ‘three-Classifier’ to be adjacent to the trace of *gakusei* ‘student’ and hence, incorrectly predicts (47b) to be grammatical like (46).

Then, how can a nominative object probe T from the object position? In Saito (2012), I adapted Shimada (2007) and Tonoike’s (2009) proposal on phrase structure building to answer this question. More concretely, I suggested that a derivation starts with a phase head and Merge applies to satisfy selectional requirements. If *v* is a phase head only when it values accusative, as argued in M. Takahashi (2010), C is the sole phase head in (44a). The derivation of the example, then, proceeds as in (48).¹⁰⁾



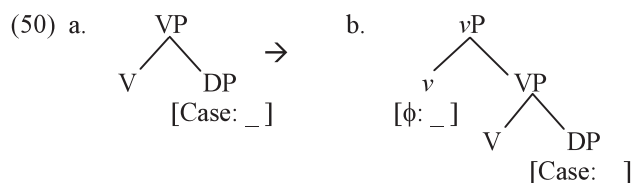
The heads are merged first as in (48a-c), as C selects T, T selects *v* and *v* selects V. Then, the object DP is merged in (48d) to satisfy the selectional requirement of V. In Saito (2012), I assume that {T, C} values nominative while {V, *v*} assigns accusative, adapting Chomsky's (2008) feature inheritance analysis. Then, the object DP in (48d) probes {T, C} and its Case is valued as nominative. In (48e), *v*P excorporates so that it can take the whole VP as a complement and receive an external argument. The subject DP is merged in (48f), and its Case is valued nominative as it probes {T, C}. {T, C} and C excorporate in (48g) and (48h) respectively in order for T and C to take the appropriate, selected complements. It is assumed throughout (48) that DPs with Case are invisible for labeling. This allows every constituent to be labeled appropriately.

It is argued in Saito (2012) that this way of phrase structure building not only makes it possible for a nominative object to probe {T, C} in situ but also opens up a way to account for the head-final structure by Kayne's (1994) LCA. I illustrate this with a simpler *v*P phase with a transitive V.



The object DP is merged with {V, v} in (49b). Then, v excorporates and the structure in (49c) is formed. If the excorporation is covert, the phonetic features of v are retained in the initial position. In this case, (49b) would be the input for the LCA. As the object asymmetrically c-commands V and v, this yields the OV order. The relative order of V and v is immaterial if they are subject to phonological merger.

I suggested in Saito (2012) that the head-initial vs. head-final distinction can in part be related to whether the excorporation is overt or covert. The LCA will assign the head-initial order to (49c). Kitahara (2013), on the other hand, entertains the hypothesis that Japanese phrase structure is derived as in (48)-(49) while English phrase structure is derived in the standard way, for example, as in (50).



Suppose this is correct. Then, a question arises why Japanese and English differ in the ways they build phrase structure. Although I do not have a concrete answer for this question, the discussion so far suggests a possibility that can be pursued. First, I assumed in the discussion of argument ellipsis in Section 2 that the activation condition holds for ϕ -feature agreement. Given this, a ϕ -feature agreement language cannot build phrase structure as in (49). In (49b), the Case feature of the DP is valued. Then, after excorporation, the ϕ -features will be valued in (49c) whether they are on v or inherited by V as proposed in Chomsky (2008). But the required ϕ -feature agreement should fail. The DP does not qualify as the goal because its Case feature is already valued. Thus, (50) would be the only option for ϕ -feature agreement languages. For languages such as Japanese that lack ϕ -feature agreement, (49) is not only possible but is optimal if some sort of earliness principle is operative on the valuation of unvalued features. The Case feature of the DP is valued as soon as the DP is merged into the structure in (49b). On the other hand, if DP is merged as in (50), its Case feature can be valued only after v enters the structure and in some cases, the DP moves to a position from where it can probe the Case-value assigner.¹¹⁾

The discussion in this section on the head-final structure of Japanese has been speculative. Further, (49) and (50) do not necessarily yield the head-final and the head-initial structures respectively. As noted, a head-initial structure can result from (49) if the excorporation is overt. Also, (50) yields a head-final structure if the object DP moves to a position that asymmetrically *c*-commands *V*, a derivation of the OV order that is standardly assumed in the LCA analysis of head-final languages. Nevertheless, (48)-(49), I believe, illustrate a plausible way to account for the head-final structure of Japanese. And if it is on the right track, the head-finality of Japanese is related to its lack of ϕ -feature agreement. Japanese builds phrase structure as in (48)-(49) because it lacks ϕ -feature agreement. And it is head-final because it builds phrase structure as in (48)-(49).

6. Conclusion

Various attempts have been made over the years to account for the syntactic properties of Japanese on the premise that it lacks ϕ -feature agreement. And Kuroda (1988) proposed that the presence vs. absence of obligatory agreement is a fundamental difference that lies behind many superficial differences between English and Japanese. In this paper, I tried to develop this idea and explore its implications. I first argued in Section 2 that Japanese allows argument ellipsis because it lacks ϕ -feature agreement. This implies that Case in Japanese is not valued through ϕ -feature agreement. I adopted Bošković's (2007) proposal to divorce Case valuation from ϕ -feature agreement, and showed that it accounts for the multiple occurrences of Case in Japanese (e.g., multiple nominatives and multiple genitives) straightforwardly.

In Section 3, I considered the function of Case in Japanese and proposed that it is to make a phrase invisible for labeling. Abstractly, then, Case in Japanese has the same function as ϕ -feature agreement in English, i.e., to accommodate labeling. I argued further that this proposal explains why Japanese has semantically vacuous scrambling. Then, building on An's (2009) proposal that genitive in Korean is nothing but a prenominal inflection on DPs and PPs, I presented the hypothesis that inflections on predicates and Case play the same role with respect to labeling. I pursued a consequence of this hypothesis in Section 4. I argued that Japanese can form compound verbs by directly merging two verbs and that this is possible precisely because the preverbal inflection on the first verb makes it possible to label the constituent formed by merger of two heads. Finally, in Section 5, I argued that Japanese phrase structure is formed by merger of heads, followed by merger of arguments, and speculated that this is, again, because of the absence of ϕ -feature agreement. I suggested that this way of phrase structure building yields the head-finality of the language with Kayne's (1994) LCA.

Macro parameters were central topics of research in the 1980's. Among them are Rizzi's (1982) pro-drop

parameter and Hale's (1980) configurationality parameter. The latter aimed to explain the clustering of the properties observed in some languages, including those in (51).

- (51)a. wide distribution of null arguments
- b. free word order
- c. extensive use of complex verb words

Japanese is among the languages that exhibit these properties. In this paper, I examined relevant phenomena in Japanese and tried to contribute to this project, relating argument ellipsis, scrambling and the syntactic formation of compound verbs to the absence of ϕ -feature agreement. If this approach is on the right track, multiple occurrences of Case and head-finality can be added to the list in (51).

Notes

* A preliminary version of this paper was presented in FAJL 6 at Humboldt University (September, 2012), and the current version in workshops at Nanzan University (March and May, 2013) and in more detail in a syntax seminar at the University of Connecticut (March, 2013). I would like to thank the audiences at those places for helpful comments, especially Jonathan Bobaljik, Željko Bošković, Yuma Iwatani, Hideki Kishimoto, Luigi Rizzi, Hubert Truckenbrodt and Kazuko Yatsushiro.

1. This does not mean that LF-copying applies after the full phrase structure is constructed, given Bobaljik's (1995) single cycle model. I assume, following Oku (1989), that LF-copying is covert Merge, and further, that it takes place cyclically as phrase structure is constructed, in accordance with the extension condition.
2. This characterization of the effect of movement on labeling is actually due to Luigi Rizzi (personal communication). Chomsky (2012) simply states that traces do not count in the labeling algorithm.
3. The reader is referred to Saito, Lin and Murasugi (2008) and the references there for detailed discussion of nominal structure in Japanese.
4. The characterization of scrambling as non-A, non-operator movement is due to Weibelhuth (1989). It is called semantically vacuous A'-movement in Saito (1989), where the radical reconstruction property illustrated in (17b) is discussed in detail.
5. The description of the distribution and the valuation of λ here is still somewhat sketchy. For example, it needs to be extended to cover various types of higher modifiers in sentential structure, and its phonetic realizations must be investigated systematically. I only present the basic idea here and leave the full execution of the idea for future research. I

- proposed in Saito (2012) that nominative is valued by {T, C} instead of T, accusative by {V, *v*} instead of V, and genitive by {N, D} instead of N. This is illustrated in Section 5.
6. There is a homophonous verb *kom* ‘become crowded’. *Kom* in (32) does not have this meaning.
 7. This analysis is suggested in Saito (2001), where Japanese lexical complex verbs are compared with Edo resultative serial verbs and Chinese compound verbs.
 8. The suffix *-i* is deleted when the stem ends in a vowel. Or alternatively, *-i* can be regarded as an epenthetic vowel that is inserted only when the stem ends in a consonant.
 9. The stem for ‘chase’ is *ow*, and *w* is deleted when it is followed by a vowel with the feature [-low].
 10. The reader is referred to Saito (2012) for the details of the analysis. The verb in (44a) is a syntactic complex verb *hanas-e* ‘speak-can’. I assume in (48) that it is a simple verb for ease of exposition.
 11. Bošković (2007) points out that the movement of DP is necessary when it originates in a position that does not c-command V, e.g., when it is an ECM subject.

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NOTES ON THE REFERENTIAL TRANSPARENCY OF PERCEPTION AND FACTIVE VERB COMPLEMENTS*

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1. Introduction

Referential opacity of the complements of verbs of ‘propositional attitude’ has been a major research topic since Frege (1892). While (1a) implies the existence of a unicorn, (1b) does not.

- (1) a. Mary saw a unicorn
- b. John said/thought that Mary saw a unicorn

At the same time, it is known that some clausal complements are referentially transparent. Higginbotham (1983) discusses small clause complements of perception and causative verbs, as in (2), and attributes the referential transparency to the interpretation of those complements as indefinite descriptions of events.

- (2) a. Mary saw John hit a unicorn
- b. Mary made John hit a unicorn

Kiparsky and Kiparsky (1970) examine the properties of factive verb complements, including their referential transparency. Representative examples are provided in (3).

- (3) a. John regrets that he hit a unicorn
- b. Mary forgot that she hit a unicorn

The purpose of this paper is to discuss the referential transparency of perception and factive verb complements in the light of some relevant Japanese data. Japanese employs two distinct complementizers, *to* and *no*, for what appears to be propositional complements. As shown in detail in Saito (2012), *to* heads the CP complements of verbs of saying and

* This is a revised version of the paper presented at the International Conference on Generative Linguistics and Philosophy, held at the University of Frankfurt in honor of Günther Grewendorf on the occasion of his retirement (June 27-29, 2014). I benefitted from discussions with many people, including Jonathan Bobaljik, Željko Bošković, Jon Gajewski, Günther Grewendorf and Luigi Rizzi. I learned about the death of James Higginbotham, a teacher and a friend since 1980, just when I was working on the material in Sections 3 and 4. It should be obvious that it was inspired by his work and teaching. The research reported here was supported in part by the Nanzan University Pache Research Subsidy I-A-2 (2014).

thinking whereas *no* heads complements that are interpreted as events, states or actions. This distinction allows us to draw a number of conclusions on the semantics of clausal complements and their referential opacity and transparency. For example, although perception verbs and factive verbs have been analyzed independently with respect to the referential transparency of their complements, the Japanese counterparts of (2a) and (3) both contain CP complements headed by *no*. This suggests that they should be analyzed in the same way. I argue in this paper that Higginbotham's (1983) individual event analysis of perception verb complements should be extended to factive verb complements.

In the following section, I survey the complementizer system of Japanese and show that the distributions of *to* and *no* provide direct evidence for Davidson's (1967, 1968-69) theory, which assumes 'events' and 'utterances' to be fundamental concepts in semantic representation. In Section 3, I go over Higginbotham's (1983) individual event analysis of perception verb complements and apply the analysis to the corresponding Japanese examples. I show that the Japanese examples provide evidence for the analysis and that the analysis should be extended to finite CPs. In Section 4, I turn to factive verb complements. I first argue that the individual event analysis should be extended to them. Then, I suggest that the differences between the complements of perception verbs and factive verbs are due to independent factors. Section 5 concludes the paper.

2. Types of Clausal Complements in Japanese: Evidence for Davidsonian Semantics

There are three complementizers, *no*, *ka*, and *to*, in Japanese, as shown in (4)-(6).

- (4) Taroo-wa [_{CP} Ziroo-ni atta no]-o kookaisiteiru
 -TOP -DAT met *no*-ACC regret

'Taroo regrets that he met Ziroo'

- (5) Taroo-wa [_{CP} Hanako-ga dare-ni atta ka] tazuneta
 -TOP -NOM who-DAT met *ka* inquired

'Taroo asked who Hanako met'

- (6) Taroo-wa [_{CP} Hanako-ga Ziroo-ni atta to] omotteiru
 -TOP -NOM -DAT met *to* think

'Taroo thinks that Hanako met Ziroo'

Ka, as instantiated in (5), is employed for questions. For the other two, I argued in Saito (2012) that CPs headed by *no* are interpreted as descriptions of events, states or actions whereas *to* embeds paraphrases of direct discourse in the sense of Plann (1982). In this section, I briefly go over the properties of these complementizers and point out the initial implications for the analysis of clausal complements. I show that the distinction in distribution between *no* and *to* provides clear evidence for Davidson's (1967, 1968-69)

proposal that ‘events’ and ‘utterances’ play important roles in semantic analysis.

Let us start with the examination of *to*. *To* can be a marker of direct quotation as in (7) but can also embed indirect discourse as in (8).

(7) Hanako-ga, “Watasi-wa tensai da,” to itta /omotta (koto)
-NOM I-TOP genius be *to* said/thought fact
‘(the fact that) Hanako said/thought, “I’m a genius”’

(8) Hanako-ga [zibun-ga tensai da to] itta /omotta (koto)
-NOM self-NOM genius be *to* said/thought fact
‘(the fact that) Hanako said/thought that she is an genius’

To as in (8) has been widely considered the Japanese counterpart of the English complementizer *that* because it appears in the CP complements of typical bridge verbs such as *iw* ‘say’ and *omow* ‘think’. However, there are many notable differences between *to* and *that*. For example, *to* can embed questions as in (9).

(9) Taroo-wa Hanako-ni [CP [CP zibun-no imooto-ga soko-ni ita ka] to] tazuneta
-TOP -DAT self-GEN sister-NOM there-at was *ka to* inquired
‘Taroo asked Hanako whether his sister was there’

Examples like (9) indicate that *to* is more similar to the Spanish *que*, discussed in Plann (1982) and Rivero (1994). Plann points out that *que*, unlike *that*, can embed questions. Her examples are shown in (10).

(10) a. Te preguntan que para qué quieres el préstamo
you ask(3pl.) that for what want(2sg.) the loan
‘They ask you what you want the loan for’

b. Pensó que cuáles serían adecuados
thought(3sg.) that which ones would be appropriate
‘He wondered which ones would be appropriate’

c. Sabía que corría
knew(3sg.) that run(3sg.)
‘He knew that he was running’

Questions are embedded under *que* in (10a-b) whereas *que* embeds a ‘propositional complement’ in (10c). Plann goes on to show that the matrix verbs that allow *que* to embed questions are not those that select questions but instead verbs of saying and thinking, that is, verbs that can co-occur with direct quotation. Thus, *que* is disallowed with the matrix verbs

in (11).

- (11) Ya supieron /entendieron /recordaron (*que) por qué lo
already found out(3pl.)/understood(3pl.)/remember(3pl.) that why it
habías hecho
had(2sg.) done

‘They already found out/understood/remembered why you had done it’

Given this, Plann proposes that *que* is ambiguous. It embeds paraphrases of direct discourse in (10a-b) and heads a ‘propositional complement’ in (10c).

If *que* can embed paraphrases of direct discourse, then it is predicted that it can take various kinds of sentences as its complements. Rivero (1994) points out that the prediction is indeed borne out. In her example (12a), an imperative sentence is embedded under *que*.

- (12) a. Dijo que a no molestarle
said (3sg.) *que* to not bother-him

‘He said not to bother him’

- b. Dijo, “A no molestarme!”
said (3sg.) to not bother-me

‘He said, “Don’t bother me!”’

(12b) contains a direct quotation and the embedded object clitic is first person. In (12a), *que* embeds an imperative sentence with a third person object clitic.

The Japanese *to* provides explicit evidence for Plann’s dual analysis of *que*. First, it embeds various kinds of sentences as shown in (13).

- (13) a. Hanako-wa Taroo-ni [CP kanozyo-no ie-ni iro to] meizita
-TOP -DAT she-GEN house-at be *to* ordered

‘Hanako ordered Taroo to be at her house’

- b. Hanako-wa Taroo-o [CP kanozyo-no ie-ni ikoo to] sasotta
-TOP -ACC she-GEN house-to go-let’s *to* invited

‘Hanako invited Taroo to go to her house’

The embedded sentence in (13a) is an imperative and that in (13b) expresses an invitation. Secondly, while *que* is ambiguous, *to* is specialized for embedding paraphrases of direct discourse. (14) is a partial list of matrix verbs that select *to*.

- (14) Japanese verbs that select *to* : *omou* ‘think’, *kangaeru* ‘consider’, *sinziru* ‘believe’, *iu* ‘say’, *sakebu* ‘scream’, *syutyoosuru* ‘claim, insist’, *tazuneru* ‘inquire’, *kitaisuru* ‘expect, hope’, *kakuninsuru* ‘confirm’, *kanziru* ‘feel’ (all in non-past tense)

These are all verbs of saying and thinking, and are compatible with direct quotation. (10c) shows that *que* can head a ‘propositional complement’. The complementizer *no* appears in the Japanese counterpart of the example, as shown in (15).

- (15) Taroo-wa [CP Hanako-ga kare-no ie-ni kuru no]-o sitteita
 -TOP -NOM he-GEN house-to come *no*-ACC knew
 ‘Taroo knew that Hanako was coming to his house’

Then, the counterparts of the two *que*’s are distinguished phonetically in Japanese.

The matrix predicates that select *no* are listed in (16).

- (16) Japanese predicates that select *no* : *wasureru* ‘forget’, *kookaisuru* ‘regret’, *miru* ‘see’, *matu* ‘wait’, *tamerau* ‘hesitate’, *kyohisuru* ‘refuse’, *ukeireru* ‘accept’, *kitaisuru* ‘expect, hope’, *kakuninsuru* ‘confirm’, *kanziru* ‘feel’ (all in non-past tense)
akiraka-da ‘clear-is’, *kanoo-da* ‘possible-is’, *kantan-da* ‘easy-is’, *muzukasii* ‘difficult-is’, *taihen-da* ‘big deal-is’ (all in non-past tense)

Those in the last two lines select *no*-headed CPs as subjects. The list shows that CPs headed by *no* are interpreted as descriptions of events, states or actions. For example, what one forgets is a past event/state or to perform an action. What one regrets is a past event or action. And what one waits for is a future event or state.

The difference in distribution between *to* and *no* indicates that ‘paraphrases of direct discourse’ and ‘descriptions of events, states and actions’ are clearly distinguished in language. This is not obvious with the English examples in (17) but the distinction can be observed in the Japanese examples in (18).

- (17) a. John thinks [CP that his sister went in London]
 b. John forgot [CP that his sister went in London]

- (18) a. Taroo-wa [CP kare-no imooto-ga Rondon-ni itta to] omotteiru
 -TOP he-GEN sister-NOM London-in went *to* think
 ‘Taroo thinks that his sister went in London’

- b. Taroo-wa [CP kare-no imooto-ga Rondon-ni itta no]-o wasurete ita
 -TOP he-GEN sister-NOM London-in went *no*-ACC forgot
 ‘Taroo forgot that his sister went in London’

One semantic analysis that makes this distinction is Davidson's (1967, 1968-69). First, he assigns the semantic representation in (19b) to the event sentence in (19a).¹

- (19) a. Mary opened the door with the key
 b. $\exists e$ [opened (Mary, the door, e) & with (e, the key)]

Among the arguments for (19b) is that it enables us to capture the inference from (19a) to 'Mary opened the door.' On the other hand, it is proposed in Davidson (1968-69) that sentences with verbs of propositional attitude have semantic representations that include 'utterances'. An example is shown in (20).

- (20) a. Galileo said that the Earth moves
 b. $\exists u$ [said (Galileo, u) & SS (u, that)] [The Earth moves]

(20b) states roughly that Galileo made the utterance *u* and *u* has the 'same-saying relation' with 'that', where the content of 'that' is that the Earth moves. Thus, events and utterances occur as individuals in semantic representations.

The distinction between *no*-headed CPs and *to*-headed CPs in Japanese fits very well with Davidson's proposals. The former are interpreted as descriptions of events as in (19b). I will elaborate on this in the subsequent sections. The latter, on the other hand, embed sentences that are in the 'same-saying relation' with direct quotations. The 'same-saying relation' in fact seems identical to Plann's (1982) 'paraphrase'. It is already pointed out in Lahiri (1991) that the distribution of *que* provides strong support for Davidson's analysis of sentences with propositional attitude verbs. The analysis readily accommodates examples where *que* takes question complements, for example. This is illustrated with a Japanese example with *to* in (21).

- (21) a. Taroo-wa [CP [CP dare-ga waratta ka] to] kiita /itta
 -TOP who-NOM laughed *ka to* asked/said
 'Lit. Taroo asked/said that who laughed'
 b. $\exists u$ [asked/said (Taroo, u) & SS (u, that)]. [Who laughed?]

No-headed CPs and *to*-headed CPs are not only selected by different matrix verbs but also occupy different positions in the hierarchy of complementizers. An embedded clause in Japanese can contain all three of the complementizers as shown in (22).

¹ Tense is ignored in (19b) and subsequent semantic representations in this section. 'e' stands for an event in Davidson's (1967) analysis, but I assume that sentences expressing states have similar representations. (ia) then is interpreted as in (ib).

- (i) a. John is tall
 b. $\exists s$ [tall (John, s)]

(22) Taroo-wa [CP kare-no imooto-ga soko-ni ita (no) ka (to)] tazuneta
 -TOP he-GEN sister-NOM there-in was *no ka to* inquired

‘Taroo asked whether his sister was there’

As *no* and *to* are optional, there are three possibilities for the complementizer sequence in the embedded clause; *no-ka*, *ka-to* and *no-ka-to*. These are in fact the only possible sequences of complementizers. This indicates that *no*, *ka* and *to* are hierarchically ordered as in (23).

(23) [CP [CP [CP [TP ...] *no*] *ka*] *to*]

In Saito (2012), I argued that thematic topics are not allowed within *no*-headed CPs but can appear recursively within CPs headed by *ka* or *to*. Then, adopting the proposal of Hiraiwa and Ishihara (2002) and Matsumoto (2010) that *no* is a Finite head, I concluded that the cartographic structure of the Japanese right periphery is as in (24).

(24) [CP [CP [CP [CP [TP ...] Finite (*no*)] Topic*] Force (*ka*)] Report (*to*)]

This is quite similar to the structure of the left periphery proposed by Rizzi (1997), shown in (25), and hence, suggests the universal nature of the clausal periphery.

(25) [CP Force [CP Topic* [CP Focus [CP Topic* [CP Finite [TP ...]]]]]]

The only differences are that (24) lacks the focus head but has the additional Report head.²

But the hierarchy in (23) itself demands an explanation. Further, (23) allows the sequence *no-to* but it is illicit as shown in (26).

(26) Taroo-wa [CP kare-no imooto-ga soko-ni ita (*no) to] minna-ni itta
 -TOP he-GEN sister-NOM there-in was *no to* all-DAT said

‘Taroo said to everyone that his sister was there’

The semantic distinction between *to*-headed CP and *no*-headed CPs illustrated above leads an explanation for the hierarchy and also accounts for the exception in (26). First, the sequence *no-ka* should be allowed as long as *ka* forms a question with a sentence that has a truth value. Karttunen (1977), for example, builds on Hamblin (1973) and proposes that a question refers to the set of true propositions that constitute answers to the question. This implies that questions are formed on sentences with truth values. Let us take the concrete example in (27).

(27) a. John laughed ... ∃e [laughed (John, e)]
 b. Who laughed

² ‘Report’ is the term Lahiri (1991) uses for the *que* that embeds paraphrases of direct discourse.

- c. $\{\exists e [\text{laughed}(\text{John}, e)], \exists e [\text{laughed}(\text{Mary}, e)]\}$

The semantic representation of ‘John laughed’ is shown in (27a). (27b), according to Karttunen, refers to a set of true propositions. If John and Mary laughed, then it is the set of propositions expressed by ‘John laughed’ and ‘Mary laughed’. The set will be as in (27c) if Davidsonian semantic representations are substituted for ‘propositions’. Details aside, it should be clear that a question makes sense only if it is formed on a sentence that has a truth value (yes/no question) or on a clause that yields a sentence with a truth value when a referring term is substituted for the *wh*-phrase (*wh*-questions). As a description of an event as in (27a) has a truth value, it should be possible to form questions on *no*-headed CPs.

The *ka-to* sequence is more straightforward. It should be possible because *to* embeds a paraphrase of direct discourse and the paraphrased direct discourse can be a question, as discussed above. Let us then turn to the illicit sequences, *to-ka*, *to-no*, *ka-no*, and *no-to*. *To*-headed CP express paraphrases of direct discourse, and are not descriptions of states of affairs. It is reasonable to assume, then, that they are not assigned truth values.³ Given this, it follows that the *to-ka* sequence is disallowed because questions are formed on sentences with truth values as just discussed. The *to-no* and *ka-no* sequences are ruled out because paraphrases of direct discourse and questions are not descriptions of events. Finally, the *no-to* sequence is illicit because *no*-headed CPs are interpreted as descriptions of events and not as paraphrases of direct discourse.

The brief account for the hierarchy in (23) and the illicitness of the *no-to* sequence just presented clearly needs to be made more precise. But it should be clear that the co-occurrence restrictions on the Japanese complementizers make sense only if *no*-headed CPs and *to*-headed CPs are semantically distinguished. The desired distinction obtains if the former are descriptions of events whereas the latter present paraphrases of direct discourse.

3. *No*-headed CPs as Perception Verb Complements

The distributions of *to* and *no* in Japanese enable us to reexamine some traditional issues in semantics from a new perspective. For example, let us compare the Japanese examples in (29) with the English examples in (28).

- (28) a. John thought that a unicorn would appear
 b. John feared that a unicorn would appear

³ This does not mean that utterances and their paraphrases lack internal structure. Larson and Ludlow (1993), for example, propose that they refer to interpreted logical forms that specify co-reference and binding relations in addition to quantifier scopes.

(29) a. Taroo-wa [_{CP} kirin-ga arawareru to] omotta
 -TOP kirin-NOM appear to thought

‘Taroo thought that a kirin would appear’

b. Taroo-wa [_{CP} kirin-ga arawareru no]-o osoreta
 -TOP kirin-NOM appear no-ACC feared

‘Taroo feared that a kirin would appear’

The matrix verbs in these examples are assumed to be verbs of propositional attitude, and their CP complements are referentially opaque. Thus, none of them entails the existence of a unicorn or a kirin, a Chinese mythical animal. The identical syntactic forms of the CP complements of (28a-b) suggest that these examples are to be analyzed in the same way. But the CP complements in (29a-b) take different forms. According to the analysis presented in the preceding section, the CP complement in (29a) expresses a paraphrase of direct discourse whereas that in (29b) expresses a description of an event. Then, it seems that their referential opacity demands distinct analysis, and this may well be carried over to the analysis of (28a-b).

A similar point can be made on (30a-b), but in the opposite direction.

(30) a. Mary saw a unicorn kick Bill

b. Mary regrets that she kicked a unicorn

The complements (30a) and (30b) are both referentially transparent, and the examples both entail the existence of a unicorn. Yet, as far as I know, their referential transparency has been treated separately because the perception verb complement in (30a) is a small clause whereas the factive verb *regret* in (30b) takes a finite CP complement. However, (31) shows that complements of perception and factive verbs have identical syntactic forms in Japanese.

(31) a. Hanako-wa [_{CP} kirin-ga Ziroo-o keru no]-o mita
 -TOP kirin-NOM -ACC kick no-ACC saw

‘Hanako saw a kirin kick Ziroo’

b. Hanako-wa [_{CP} *pro* kirin-o ketta no]-o kookaisite iru
 -TOP kirin-ACC kicked no-ACC regret

‘Hanako regrets that she kicked a unicorn’

Then, it is quite possible that the referential transparency of the complement arises in the same way in (31a-b) as well as in (30a-b).

In this section and the next, I pursue the second point by presenting a preliminary analysis of perception and factive verb complements in Japanese. In this section, I take

Higginbotham's (1983) analysis of perception verb complements in English as the starting point and show that it successfully explains the properties of their Japanese counterparts.

Higginbotham (1983), in reply to Barwise's (1981) argument for situation semantics, presents an extensional analysis for perception verb complements. The analysis directly incorporates Davidson's (1967) event semantics introduced above and proposes that perception verb complements are indefinite descriptions of events, as illustrated in (32).

- (32) a. John saw Mary hit Bill
 b. John sees [$\text{an } e$: hit (Mary, Bill, e)] (at some time t in the past)
 c. [$\exists e$: hit (Mary, Bill, e)] John sees e (at some time t in the past)

The small clause complement expresses an indefinite event as in (32b). As *see*, as opposed to *seek*, for example, is an extensional verb as shown in (33), the indefinite object takes scope over the main sentence as in (32c).

- (33) a. John saw a unicorn
 b. John seeks a unicorn

The referential transparency of the small clause complement follows as the semantic representation for (30a) in (34a), for example, entails (34b).

- (34) a. [$\exists e$: [$\exists x$: x a unicorn] hit (x , Bill, e)] Mary sees e (at some time t in the past)
 b. [$\exists e$] [$\exists x$: x a unicorn] hit (x , Bill, e) (at some time t in the past)

Higginbotham goes on to point out that the analysis yields the other properties of perception verb complements Barwise (1981) lists. A couple of those properties are shown in (34).

- (34) a. If John sees SC, then S, where SC is quantifier-free and S is the present-tense full clause corresponding to SC (small clause).
 b. Existential quantifiers taking scope over the small clause are exportable. In particular, all conditionals of the sort of (i) is true.
 (i) If John sees somebody leave, then there is somebody whom John sees leave.

(34a) is straightforward because (32c), repeated as (35a), for example, entails (35b).

- (35) a. [$\exists e$: hit (Mary, Bill, e)] John sees e (at some time t in the past)
 b. [$\exists e$] hit (Mary, Bill, e) (at some time t in the past)

Higginbotham points out further that (34a) holds even when SC contains a quantifier, as long as the quantifier is monotone increasing.⁴ Thus, (36) is true.

⁴ A quantifier Q is *monotone increasing* if [Qx : $A(x)$] $B(x) \rightarrow$ [Qx : $A(x)$] $C(x)$, where the extension of $B(x)$ is contained in the extension of $C(x)$.

(36) If John saw somebody leave, then somebody left

He shows that this also follows from his individual event analysis as (37a) entails (37b).

- (37) a. $[\exists e: [\exists x: x \text{ a person}] \text{ leave } (x, e)]$ John sees e (at some time t in the past)
b. $[\exists e] [\exists x: x \text{ a person}] \text{ leave } (x, e)$ (at some time t in the past)

(34b) is straightforward as well for the example because (38) is a logical consequence of (37a).

- (38) $[\exists x: x \text{ a person}] [\exists e: \text{leave } (x, e)]$ John sees e (at some time t in the past)

Perception verb complements in Japanese fit well with Higginbotham's analysis. They uniformly take *no*-headed CPs as complements, as illustrated in (39).

- (39) a. Hanako-wa $[_{CP}$ kirin-ga Ziroo-o keru no]-o mita (= (31a))
-TOP kirin-NOM -ACC kick *no*-ACC saw
'Hanako saw a kirin kick Ziroo'

- b. *Hanako-wa $[_{CP}$ kirin-ga Ziroo-o keru to] mita
-TOP kirin-NOM -ACC kick *to* saw

According to the analysis presented in the preceding section, *no*-headed CPs express descriptions of events. Then, Japanese provides explicit syntactic evidence for the individual event analysis. The semantic representation of (39a) is as in (40).

- (40) $[\exists e: [\exists x: x \text{ a kirin}] \text{ kick } (x, \text{Ziroo}, e)]$ Hanako sees e (at some time t in the past)

As noted above, the CP complement in (39a) is referentially transparent. Thus, the sentence entails that there is a kirin. Examples like (39a) also exhibit the properties in (34). (39a) entails that a kirin kicked Ziroo and that there is a kirin such that Hanako saw it kick Ziroo. All these follow from the individual event analysis as Higginbotham demonstrated for the English examples.

As Higginbotham (1983) notes, one of the key ideas behind the individual event analysis is that perception verb complements are interpreted as noun phrases (that is, as indefinite descriptions of events) although they are syntactically small clauses. It is worth mentioning in relation to this that perception verb complements, and more generally *no*-headed CP arguments, in Japanese require Case, as can be seen in (39a).⁵ Thus, perception verb complements in the language pattern with noun phrases in the syntax as well.

⁵ For this reason, *no* is often glossed as a "nominalizer." It is obviously nominal in nature in this context. But I am not concerned here with its precise categorial status, and continue to call it a complementizer.

One context in which a *no*-headed CP does not take Case is when it is embedded under the question C, *ka*, as in (42).

- (42) Taroo-wa [_{CP} kare-no imooto-ga soko-ni ita no ka] tazuneta (cf. (22))
 -TOP he-GEN sister-NOM there-in was *no ka* inquired

‘Taroo asked whether his sister was there’

If the analysis presented in the preceding section is correct, the *no*-headed CP is a sentence with a truth value in this case. I do not have a concrete proposal at this point on this dual interpretation of *no*-headed CPs. I tentatively assume that *no* is interpreted mainly as an event and takes an event sentence as its restriction as in (43).

- (43) [$e: \varphi(e)$]

Then, in sentential context, a *no*-headed CP is interpreted as a clause with existential quantification as in (44a), which is equivalent to (44b).

- (44) a. [$\exists e: \varphi(e)$] $e = e$
 b. [$\exists e$] $\varphi(e)$

I leave it for future research to make this more precise and principled.

Returning to Higginbotham’s analysis, it is also possible to make a small refinement on the basis of Japanese examples. He proposes that perception verb complements are subject to the individual event analysis precisely because they are small clauses. He points out in support of this that the small clause complements of causative verbs have the same properties. A relevant example is shown in (45).

- (45) a. John made somebody leave
 b. [$\exists e: [\exists x: x \text{ a person}] \text{leave}(x, e)$] John causes e (at some time t in the past)

Causative verb complements share all the properties of perception verb complements discussed above, and this follows from the representation in (41b).

The Japanese causative verb (*s*)*ase* also takes small clause complements although it is realized as a verbal suffix on the surface as (46) shows.

- (46) Hanako-ga Taroo-o zibun-no heya-de benkyoos-ase-ta
 -NOM -ACC self-GEN room-in study-make-Past

‘Hanako made Taroo study in her/his room’

Since Kuroda (1965), it is widely accepted that (*s*)*ase* takes a clausal complement. In (46), the subject-oriented reflexive *zibun* can take either *Hanako* or *Taroo* as its antecedent. This shows that the latter is a subject of the embedded clause at the appropriate level of

representation. The absence of Condition (B) effect in (47) leads to the same conclusion, as Oshima (1979) points out.

(47) Hanako-ga Taroo-ni kanozyo-o suisens-ase-ta
-NOM -DAT she-ACC recommend-make-Past

‘Hanako made Taroo recommend her’

But the embedded clause in (47) is headed by *suisens* ‘recommend’ and lacks tense. It is assumed in more recent literature, such as Murasugi and Hashimoto (2004), that *(s)ase* takes a *vP*, that is, a small clause, as its complement. Then, Japanese causative sentences, which share the properties of their English counterparts, are consistent with Higginbotham’s proposal that the individual event analysis applies to small clauses.

However, perception verb complements in Japanese, examined above, are finite CPs. An additional example is provided in (48).

(48) Taroo-wa [_{CP} kirin-ga heya-ni hair-u /hait-ta no]-o mita
-TOP kirin-NOM room-to enter-Pres/enter-Past *no*-ACC saw

‘Taroo saw a kirin enter the room’

In this example, the embedded verb can appear with either the non-past suffix *-ru* or the past suffix *-ta*. There is only a slight difference in meaning. The past suffix is interpreted more like an aspect in this context and the sentence with *-ta* is more accurately translated as ‘Taroo saw a kirin complete its entrance into the room’. If the analysis in the preceding section is on the right track, the example shows that a finite CP is also subject to the individual event analysis.

This opens the possibility to apply the analysis to factive verb complements as in (49).

(49) Taroo-wa [_{CP} Hanako-ga Rondon-ni i-ru no]-o wasurete ita
-TOP -NOM London-in be-Pres *no*-ACC forgot

‘Taroo forgot that Hanako was in London’

Factive verbs also uniformly take *no*-headed CP complements. This implies that their complements are interpreted as description of events, states or actions. Then, it is only natural to apply the individual event analysis to them. I will pursue this in the following section.

4. An Individual Event Analysis of Factive Verb Complements

Kuno (1973), in his discussion of *no* and *to*, states that *no*-headed CPs, as opposed to

to-headed CPs, carry factive presuppositions. The examples in (50) are consistent with this.

- (50) a. Taroo-wa [_{CP} *pro* soko-ni itta no]-o kookaisite iru
 -TOP there-to went *no*-ACC regret

‘Taroo regrets that he went there’

- b. Taroo-wa [_{CP} Hanako-ga soko-ni itta to] omotte iru
 -TOP -NOM there-to went *to* think

‘Taroo thinks that Hanako went there’

Only (50a) presupposes the truth of the complement sentence. However, the list of the verbs that select *no*-headed CPs in (16), repeated below as (51), shows that the generalization cannot be maintained.

- (51) Japanese predicates that select *no* : *wasureru* ‘forget’, *kookaisuru* ‘regret’, *miru* ‘see’, *matu* ‘wait’, *tamerau* ‘hesitate’, *kyohisuru* ‘refuse’, *ukeireru* ‘accept’, *kitaisuru* ‘expect, hope’, *kakuninsuru* ‘confirm’, *kanziru* ‘feel’ (all in non-past tense)
akiraka-da ‘clear-is’, *kanoo-da* ‘possible-is’, *kantan-da* ‘easy-is’, *muzukasii* ‘difficult-is’, *taihen-da* ‘big deal-is’ (all in non-past tense)

Kitaisuru ‘expect, hope’, for example, is clearly not a factive verb. The generalization, instead, seems to be that factive verbs, such as *wasureru* ‘forget’ and *kookaisuru* ‘regret’, select *no*-headed CPs and not *to*-headed CPs. They cannot select *to*-headed CPs because what one regrets, for example, is not an utterance but an event or a state.⁶ In this section, I apply the individual event analysis to factive verb complements, and examine how their properties can be explained.

First, it is known that factive verb complements share all the properties of the perception verb complements discussed above. Let us consider the example in (52).

⁶ The fact that factive verbs select *no*-headed CPs provide support for Haegeman’s (2006) proposal that factive verb complements are smaller than CP complements of verbs of propositional attitude and are FiniteP’s.

It should be noted here that a *to*-headed CP can co-occur with factive verbs as adverbial clauses as in (i).

- (i) Taroo-wa [_{CP} zibun-ga baka datta to] [_{CP} *pro* soko-ni itta no]-o kookaisite iru
 -TOP self-NOM fool was *to* there-to went *no*-ACC regret

‘Taroo regrets that he went there, (thinking/saying) that he was a fool’

In cases like these, it is still the *no*-headed CP that the matrix verb selects.

(52) Hanako-wa [_{CP} *pro* kirin-o ketta no]-o kookaisite iru
 -TOP kirin-ACC kicked *no*-ACC regret

‘Hanako regrets that she kicked a kirin’

The CP complement is referentially transparent: (52) implies that a kirin exists. (52) entails that Hanako kicked a kirin and also that there is a kirin such that Hanako regrets that she kicked it. These properties follow with the application of the individual event analysis. The analysis assigns the representation in (53) to (52).⁷

(53) [$\exists e$: [$\exists x$: x a kirin] kicked (Hanako, x, e)] Hanako regrets e

(53) entails (54a-c).

- (54) a. [$\exists x$] x is a kirin
 b. [$\exists e$] [$\exists x$: x a kirin] kick (Hanako, x, e)
 c. [$\exists x$: x a kirin] [$\exists e$: kick (Hanako, x, e)] Hanako regrets e

Thus, the individual event analysis can be extended to factive verb complements.

There are however notable differences between the complements of perception verbs and factive verbs. First, it is widely accepted since Kiparsky and Kiparsky (1970) that factive verbs accompany factive presuppositions. This was discussed in relation to Kuno’s (1973) analysis of the contrast in (50). Relevant English examples are given in (55).

- (55) a. John forgot that Mary bit a unicorn
 b. Mary regrets that she bit a unicorn

These sentences presuppose that Mary bit a unicorn. On the other hand, there is no such presupposition in the examples in (56) with perception and causative verbs.

- (56) a. John saw Mary bite a unicorn
 b. John made Mary bite a unicorn

However, it is not clear that this difference is problematic for a uniform semantic analysis of the complements in (55) and (56). Simons (2007) argues that factive presupposition does not demand a semantic account but arises with the information structure. In particular, she points out that there is no such presupposition when a factive verb functions as a kind of evidential. One of her examples is shown in (57).

⁷ The factive verb complements may express definite descriptions, rather than indefinite descriptions, of events. In this case, (53) should be more accurately as in (i).

(i) [$\exists e$: [$\exists x$: x a kirin] kicked (Hanako, x, e)] Hanako regrets e

This, however, does not affect the discussion that follows, as far as I can see.

- (57) A. Where did Louise go last week?
 B. a. Henry discovered that she had a job interview at Princeton.
 b. Henry learned that she had a job interview at Princeton.
 c. Henry found out that she had a job interview at Princeton.

In (57B), the truth of the complement clause is not presupposed. The clause provides new information while the matrix part specifies the source of the information. On the basis of detailed examination of examples of this kind, Simons concludes that presupposition is related to information structure rather than semantics. She notes that a factive sentence entails the truth of the embedded clause even when the matrix verb is used evidentially. Thus, (58Bb) is quite odd even as a response to (58A).

- (58) A. Which course did Louise fail?
 B. a. Henry, the idiot, discovered that she failed calculus.
 b. #Henry, entirely incorrectly, realized that she failed calculus.

The entailment relation, then, is to be captured in the semantics, and the individual event analysis achieves this.

The second difference between perception and factive verbs has to do with the generality of the entailment relation just discussed. Recall Higginbotham's analysis of the entailment in (36), repeated below in (59).

- (59) If John saw somebody leave, then somebody left

The point was that this kind of entailment holds even when the small clause complement of a perception verb contains a quantifier as long as the quantifier is monotone increasing. The entailment fails with non-monotone increasing quantifiers as illustrated in (60).

- (60) If John saw nobody leave, then nobody left

On the other hand, a sentence with a factive verb implies the truth of its complement without exception. Thus, (61) hold.

- (61) If Mary regrets that nobody went to London, then nobody went to London

This difference cannot be attributed to the small clause status of perception verb complements. Japanese perception verbs take finite CP complements and yet, the entailment fails with non-monotone increasing quantifiers. This is illustrated in (62) with the quantifier, 'exactly 10 students'.

- (62) a. Hanako-wa [_{CP} gakusei-ga tyoodo zyuu-nin hikooki-ni noru no]-o mita
 -TOP student-NOM exactly ten-person plane-on board *no*-ACC saw
 'Hanako saw exactly ten students board the plane'

- b. Gakusei-ga tyoodo zyuu-nin hikooki-ni notta
 student-NOM exactly ten-person plane-on boarded

‘Exactly ten students boarded the plane’

(62a) does not entail (62b).

Then, does this difference pose a problem for the unified individual event analysis of the complements of perception verbs and factive verbs? I would like to suggest that the answer is negative. I illustrate the point by discussing the difference in the ways the tense of the embedded clause is interpreted in the two types of sentences. A perception verb individualizes events more finely along the time dimension. As is briefly discussed below, it seems to individualize events in other dimensions as well.

First, in a sentence with the perception verb *see*, for example, the matrix event of seeing and the event the embedded clause expresses must take place simultaneously. This is encoded in the syntax in English. The embedded clause, being a small clause, lacks tense. Thus, (63a) is interpreted as (63b) with a specific time *t* in the past.

- (63) a. John saw Mary leave
 b. [$\exists e$: leave (Mary, e)] John sees e (at some time *t* in the past)

This is true for Japanese as well although perception verb complements accompany tense. Let us consider again (48), repeated below in (64).

- (64) Taroo-wa [_{CP} kirin-ga heya-ni hair-u /hait-ta no]-o mita
 -TOP kirin-NOM room-to enter-Pres/enter-Past *no*-ACC saw

‘Taroo saw a kirin enter the room’

With the non-past *-(r)u*, a kirin entering the room and Taroo seeing the event must take place simultaneously. And this is true with the past *-ta* as well. As noted above, *-ta*, in this context, is interpreted as a perfective aspect, and the sentence roughly means that Taroo saw a kirin complete its entrance into the room. The event of a kirin completing its action and Taroo seeing the event are simultaneous.

Then, what (65a) and its Japanese counterpart entail must be (65b).

- (65) a. John saw exactly ten students board the plane
 b. Exactly ten students boarded the plane at the time John saw exactly ten students board the plane
 c. Exactly ten students boarded the plane

(65b) is not equivalent to the tense-wise more general sentence in (65c). In the case of Japanese, it is possible to specify the time of the perceived event as in (66).

(66) Hanako-wa [_{CP}gakusei-ga sono toki tyoodo zyuu-nin hikooki-ni noru
 -TOP student-NOM that time exactly ten-person plane-on board
 no]-o mita
no-ACC saw

‘Lit. Hanako saw [exactly ten students board the plane at that time]’

(66) entails that exactly ten students boarded the plane at that time.⁸

On the other hand, the tense of the embedded clause need not coincide with the tense of the matrix clause in factive sentences. The point is obvious with the simple examples in (67).

(67) a. John regrets that he boarded the plane

b. Taroo-wa [_{CP}*pro* hikooki-ni notta no]-o kookaisite iru
 -TOP plane-on boarded *no*-ACC regret

‘Taroo regrets that he boarded the plane’

These examples are interpreted as in (68).

(68) [$\exists e$: board (John, the plane, e) (at some t in the past)] John regrets e (at the speech time)

Similarly, (69a) with the non-monotone increasing *only ten* and its Japanese counterpart are interpreted as in (69b).

(69) a. John regrets that only ten students boarded the plane

b. [$\exists e$: [only10x: x a student] board (x, the plane, e) (at some t in the past)] John regrets e (at the speech time)

(69b) entails that only ten students boarded the plane. As expected, if *at that time* is added to the complement of (69) as in (70a), it only entails (70b) and not (70c).

(70) a. John regrets that only ten students boarded the plane at that time

b. Only ten students boarded the plane at that time

c. Only ten students boarded the plane

The analysis of the differences between the complements of perception verbs and factive verbs need to be made more precise. What the discussion above suggests is that the

⁸ Note that this complication does not affect monotone increasing quantifiers. (ia) entails (ib) when Q is monotone increasing.

(i) a. [Qx : A(x)] B(x) at a specific time t in the past.
 b. [Qx : A(x)] B(x) at some time in the past.

event that a perception verb complement expresses is individualized in relation to the time of the matrix event, whereas the event (or state) that a factive verb complement expresses is more general in this respect.⁹ Here, it is possible that the events of perception verb complements can be individualized in other dimensions as well. For example, one may raise doubts on the inference from (65a) to (65b) in the following situation. Suppose that John is at the economy class boarding gate, and saw exactly ten students board the plane. Suppose also that there were five students who boarded the same plane through the business class boarding gate at the same time, and John did not see them board the plane. In this situation, one may say that (65a) is true and (65b) is false. Then, the description of the event must be made more specific (for example, by adding *through the economy class gate*) so that the entailment is maintained. The complexity with the individualization of events is more evident in with causative sentences. (71a) does not entail (71b) or (71c).

- (71) a. Mary made exactly ten students board the plane
 b. Exactly ten students boarded the plane
 c. Exactly ten students boarded the plane at the time Mary made exactly ten students board the plane

In the case of causatives, events seem to be individualized with respect to cause. Thus, what (71a) implies, roughly, is that exactly ten students boarded the plane because of Mary.

Also, the discussion above treated the perception verb complements in Japanese and English in the same way. There are a few differences. For example, the small clause complement in English completely lacks tense, and hence, the matrix tense extends to it. As the matrix event of seeing is instantaneous, (72) is odd unless Mary's height fluctuates, as Higginbotham points out.

(72) #John saw Mary tall

On the other hand, the Japanese counterpart of (72) is quite natural as shown in (73).

(73) Taroo-wa [_{CP} Hanako-ga se-ga takai no]-o mite, odoriota
 -TOP -NOM height-NOM tall no-ACC seeing surprised

'Lit. Taroo was surprised to see Hanako tall'

This must be because the embedded clause carries its own tense. All that is required is that the event (or state) that the embedded clause expresses occurs (or holds) when matrix event takes place.

⁹ In this sense, it makes sense to say that factive verb complements are factive whereas perception verb complements are not. It is also understandable that Higginbotham presented the *individual* event analysis for perception verb complements.

Nevertheless, the general point of the discussion, I hope, was clear. It suggests that Higginbotham's (1983) individual event analysis can be extended to finite CPs, in particular, to factive verb complements. The differences between the complements of perception verbs and factive verbs are likely to be due to independent factors. The factive presupposition of the latter should be attributed to the information structure if Simons (2007) is correct. And the truth of a perception verb complement apparently fails to be entailed in some cases because a perception verb forces a finer individualization of the event its complement expresses with respect to time and other dimensions.

5. Conclusion

In this paper, I discussed the distributions of the Japanese complementizers, *no*, *ka* and *to*, and argued that the distinction between *no* and *to*, in particular, provides direct evidence for Davidson's (1967, 1968-69) theory of semantic representation. Then, I presented an analysis for perception verb complements in Japanese, which are uniformly finite CPs headed by *no*. I argued that they provide evidence for Higginbotham's (1983) individual event analysis and for the extension of the analysis from small clauses to finite CPs. Finally, I suggested that the analysis should be applied to factive verb complements as well, which are also finite CPs headed by *no* in Japanese.

The discussion in this paper, if it is on the right track, has a number of additional implications for the analysis of English. I argued that the individual event analysis should be extended to the finite CP complements of factive verbs in part because the Japanese counterparts of those CPs are headed by *no* and express descriptions of events. The same point can be made for non-finite CP complements as in (74).

(74) John waited for Mary to come

The Japanese counterpart of *wait*, *mat*, takes a CP complement headed by *no*, as shown in (75).

(75) Taroo-wa [CP Hanako-ga kuru no]-o matta
 -TOP -NOM come *no*-ACC waited

‘Taroo waited for Hanako to come’

Then, the individual event analysis should be extended to non-finite CPs as well. The complement of *wait* is referentially opaque simply because *wait* is an intensional verb.

Also, according to the analysis suggested in this paper, the complements in (76a-b) are interpreted differently although they look identical syntactically.

(76) a. John says that he went to London
 b. John regrets that he went to London

The complement in (76a) expresses a paraphrase of direct discourse whereas that in (76b) expresses an event. Then, *that* in (76a) must be a Report head just like *to* in Japanese. This raises the question why *that* differs from *que* in Spanish and *to* in Japanese, and cannot embed a question, for example.

(77) *John asked that what Mary bought

There are a number of possibilities for this. For example, *that* as a Report head may select Finite. Or it may consist of two features, [+Report] and [+Finite], and consequently, must originate at Fin and move to Report. In the latter case, (77) may be ruled out as *that* moves across a question C. I must leave the pursuit of these implications, as well as the refinement of the arguments presented in this paper, for future research.

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Cartography and Selection: Case Studies in Japanese *

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1 Introduction

The cartographic structure of the Japanese right periphery has been investigated extensively in recent years. For example, Ueda (2007) examines modals and presents the following structure:

(1) [U-modalP [E-modalP [TP ... T] E(pistemic)-modal] U(terance)-modal]

Saito (2009) discusses the hierarchical relations of complementizers and arrives at (2).

(2) [CP ... [CP ... [CP [TP ... T] Finite (*no*)] Force (*ka*)] Report (*to*)]

Endo (2010), on the other hand, considers the distributions of sentence-final particles and proposes (3).

(3) [Mod-SpeechActP [Mod-EvaluativeP [Mod-EvidentialP [Mod-EpistemicP [TP ... T] *wa*] *na*] *yo*] *ne*]

The purpose of this paper is two-fold. First, I would like to put these results together and present a more comprehensive picture of the cartography of the Japanese right periphery.

* This is a slightly revised version of the paper presented at the conference, “Syntactic Cartography – Where Do We Go from Here?”, held at the University of Geneva on June 7-9, 2012. The material was presented also at seminars at the University of Maryland, Nanzan University and the University of Connecticut. I would like to thank the audiences at these places for helpful comments, especially Jonathan Bobaljik, Norbert Hornstein, Richie Kayne, Hideki Kishimoto, Keiko Murasugi, Paul Portner, Ian Roberts, and Kensuke Takita. Special thanks are due to Tomoko Haraguchi for discussions that inspired me to pursue the research reported here. Section 2 is an extension of her work on Japanese modals, Haraguchi (2012), and Section 4 is a summary of our joint paper on Japanese sentence-final particles, Saito and Haraguchi (2012).

Secondly, I will reconsider the hierarchies themselves and explore their sources. It is assumed in the Minimalist research that phrase structure is constructed by the minimal operation Merge, which takes two syntactic objects and forms their union. (See Chomsky 1995, 2013.) This operation, taken by itself, does not yield the hierarchies in (1)-(3). Then, their sources must be sought elsewhere to the extent that they are correct. I will show that s-selection plays a role to determine the distributions of heads in the right periphery. I will argue in addition that compatibilities in morphology, semantics and speech acts limit the distributions of modals, complementizers and sentence-final particles respectively.

The following section concerns modals. Although Ueda (2007) proposes the hierarchy in (1), she also points out that a simple sentence cannot contain more than one modal. I will show that this generalization and more generally, the distributions of modals follow from morphology and s-selection. In Section 3, I will briefly review the discussion in Saito (2009) and argue that the hierarchy of complementizers in (2) can be explained by the s-selection and semantic properties of the complementizers. Finally, in Section 4, I will present Haraguchi's (2012) argument that sentence-final particles are genuine discourse elements whose distributions are confined to matrix contexts, and suggest that their distributions are dictated by s-selection as well as compatibility of speech acts. Section 5 concludes the paper.

2 The Uniqueness Condition on Modals in Japanese

In the Japanese syntax literature, 'modal' often refers to a category of clause-final elements that express modality or force and do not carry tense. Ueda (2007) classifies them into the two groups shown in (4).

- (4) a. E(pitemic)-modals: *daroo* (surmise), *desyoo* (formal surmise), *mai* (negative surmise)
 b. U(terance)-modals: *ro/e* (imperative), *(i)nasai* (formal imperative), *na* (negative imperative), *yoo* (invitation), *(i)masyoo* (formal invitation), *yoo* (volition), *mai* (negative volition)

She assumes the hierarchy in (1), and at the same time, observes that two modals cannot co-occur in the same clause. The observation is confirmed by the examples in (5).

- (5) a. Kimi-wa soko-e ik-u daroo (*na)
 you-TOP there-to go-Pres. will don't
 'Don't go there (Don't be going there)'

- b. Taroo-wa soko-e ik-u mai (*daroo)
 Taroo-TOP there-to go-Pres. won't will
 'Taroo won't go there (I guess Taroo won't go there)'

I will argue in this section that this uniqueness condition on modals follows from their lexical properties.¹

It should be noted here that English modals exhibit a similar uniqueness condition. Thus, (6a) is totally out although it is synonymous with the grammatical (6b).

- (6) a. *John may can solve the problem
 b. John may be able to solve the problem

It has long been observed that English modals can occur only in finite contexts and hence, cannot follow another modal. This suggests that they have a morphological requirement to merge with an affixal tense. I will assume that a similar approach should be pursued for the parallel case in Japanese. Yet, the situation is slightly different as Japanese modals, by definition, do not carry tense.

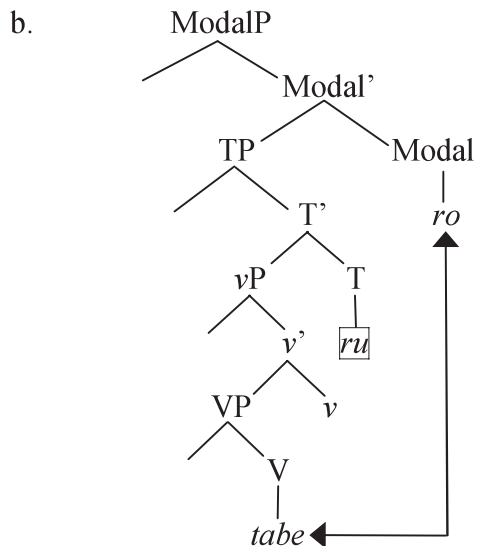
First, it seems plausible that all the modals in (4) take propositional complements. Propositions can take the syntactic forms of a *vP* (as in small clauses), a TP and a ModalP, for example. This by itself does not exclude the multiple occurrences of modals in (5). However, each modal has additional lexical requirements. Let's examine the imperative *ro/e* first. This element is a suffix that attaches to verb stems. As shown in (7), *ro* is employed for verb stems that end in vowels and *e* for those that end in consonants.

- (7) a. Taroo-wa sore-o tabe-ro
 Taroo-TOP it-ACC eat-Imp.
 'Taroo, eat it'
 b. Taroo-wa soko-ni ik-e
 Taroo-TOP there-to go-Imp.
 'Taroo, go there'

¹ The material in this section developed out of discussions with Tomoko Haraguchi over the last couple of years. See Haraguchi (2012) for an analysis that is different but shares the same general approach.

The suffixal nature of *ro/e* automatically limits its distribution. For example, if it takes a TP complement, then T intervenes and blocks its morphological merger with the verb, as illustrated in (8).

- (8) a. *Taroo-wa sore-o tabe-ru-ro
 Taroo-TOP it-ACC eat-Pres.-Imp.



The only morphologically permissible option is for it to take a vP complement. In this case, the suffix can successfully merge with V (or V-v complex). Significantly, *ro/e* cannot take a ModalP as its complement because the intervening modal blocks the morphological merger just like T. There is an independent reason then that *ro/e* cannot follow another modal.

Most of the other utterance modals have the same suffixal property. Among them are (*i*)*nasai* (formal imperative), *yoo* (invitation, volition), and (*i*)*masyoo* (formal invitation). Examples of (*i*)*masyoo* are shown in (9).²

- (9) a. Sore-o tabe-masyoo
 it-ACC eat-let's
 'Let's eat it'

² The form *masyoo* appears when the verb stem ends in a vowel, and *imasyoo* when the verb stem ends in a consonant. I assume that the morpheme is *imasyoo*, and that the initial vowel of the suffix is deleted by the following morphophonological rule when the stem ends in a vowel:

(i) $V \rightarrow \emptyset / V + _ C$

- b. Soko-e ik-imasyoo
 there-to go-let's
 'Let's go there'

I conclude then that they all must take *vP* complements in order to morphologically merge with *V*.

The epistemic modals *daroo* (surmise) and *desyoo* (formal surmise) also exhibit a regular pattern. They always take a *TP* complement. The head *T* can be present or past, and can be a verbal tense (*ru/ta*) or an adjectival tense (*i/katta*). This is shown in (10).

- (10) a. Taroo-wa sore-o tabe-ru /tabe-ta daroo
 Taroo-TOP it-ACC eat-Pres./eat-Past will
 'I guess Taroo will eat/ate it'
- b. Soko-no huyu-wa samu-i /samu-katta daroo
 there-GEN winter-TOP cold-Pres./cold-Past will
 'I guess the winter there is/was cold'

(11) shows that they cannot be employed as verbal or adjectival suffixes.³

- (11) a. *Taroo-wa sore-o tabe-daroo
 Taroo-TOP it-ACC eat-will
 'I guess Taroo eats it'
- b. *Soko-no huyu-wa samu-daroo
 there-GEN winter-TOP cold-will
 'I guess the winter there is cold'

Thus, *daroo* (and *desyoo*) takes a tensed proposition as a complement and *s*-selects *T*. It follows that they cannot have a *ModalP* as a complement.

The situation with *na* (negative imperative) is slightly more complex but is similar. It takes a *TP* with verbal present tense as its complement. The following examples meet this

³ There is another modal *karoo*, which is similar in meaning to *daroo* but is a suffix that attaches to adjectival stems. Thus, (11b) becomes grammatical when *karoo* is substituted for *daroo* as in (i).

- (i) Soko-no huyu-wa samu-karoo
 there-GEN winter-TOP cold-will
 'I guess the winter there is cold'

condition:

- (12) a. Taroo-wa sore-o tabe-ru na
Taroo-TOP it-ACC eat-Pres. don't
'Taroo, don't eat it'
- b. Taroo-wa soko-ni ik-u na
Taroo-TOP there-to go-Pres. don't
'Taroo, don't go there'

(13) shows that *na* is not a verbal suffix and also cannot take TP complements headed by past or adjectival present.

- (13) a. *Taroo-wa sore-o tabe-na
Taroo-TOP it-ACC eat-don't
'Taroo, don't eat it'
- b. *Taroo-wa sore-o tabe-ta na
Taroo-TOP it-ACC eat-Past don't
'Taroo, you should not have eaten it'
- c. *Taroo-wa kimuzukasi(-i) na
Taroo-TOP difficult(-Pres.) don't
'Taroo, don't be difficult'

It appears then that *na* selects for a specific subcategory, verbal present tense. But this requirement is plausibly *s*-selection rather than categorial selection (*c*-selection).

It is well known that verbal present tense *ru* is more precisely characterized as indicating non-past. Thus, it occurs also in future contexts as in (14).

- (14) a. Hanako-wa asita wani-o tabe-ru
Hanako-NOM tomorrow alligator-ACC eat-Pres.
'Hanako is going to eat alligator meat tomorrow'
- b. Taroo-wa rainen soko-ni ik-u
Taroo-TOP next.year there-to go-Pres.
'Taroo is going there next year'

This extension to future contexts, as far as I know, is not observed with the adjectival present *i*. (15) is ungrammatical.

- (15) a. *Taroo-wa asita kimuzukasi-i
 Taroo-TOP tomorrow difficult-Pres.
 ‘Taroo will be difficult tomorrow’
- b. *Watasi-wa asita kanasi-i
 I-NOM tomorrow sad-Pres.
 ‘I will feel sad tomorrow’

Then, it can be hypothesized that *na* s-selects future tense.

The distribution of *mai* (negative volition, negative surmise) is similar. The following examples indicate that it s-selects future tense just like *na*.

- (16) a. Watasi-wa sore-o tabe-ru mai
 I-TOP it-ACC eat-Pres. won’t
 ‘I will not eat it’
- b. Watasi-wa soko-ni ik-u mai
 I-TOP there-to go-Pres. won’t
 ‘I will not go there’
- c. *Watasi-wa sore-o tabe-ta mai
 I-TOP it-ACC eat-Past won’t
 ‘I will not have eaten it’
- d. *Watasi-wa kanasi(-i) mai
 I-TOP sad-Pres. won’t
 ‘I will not feel sad’

But there is another pattern observed with *mai*, as in (17).

- (17) Watasi-wa sore-o tabe-mai
 I-TOP it-ACC eat-won’t
 ‘I guess Taroo won’t eat it’

In this example, *mai* is suffixed to the verbal stem *tabe*. Curiously, *mai* cannot be suffixed to a verb stem that ends in a consonant. Thus, an example parallel to (17) cannot be formed with (16b). Here, I tentatively propose that the verbal suffix is not *mai* but *(u)mai*. Then, the example with this suffix that corresponds to (16b) is homophonous with (16b) as in (18).⁴

⁴ The suffix is *umai* uniformly. When it is merged with *tabe* as in (17), the initial *u* is deleted according to the morphophonological rule suggested in Footnote 2.

- (18) Watasi-wa soko-ni ik-umai
 I-TOP there-to go-won't
 'I will not go there'

This concludes the discussion of all modals listed in (4). It was shown that most of them are verbal suffixes and hence, must take *vP* complements so that morphology can interpret them. *Daroo* (surmise) and *desyoo* (formal surmise) *s*-select *T* and must take *TP* complements. A similar pattern is observed with *na* (negative imperative) and *mai* (negative volition, negative surmise), which *s*-select *T* with future tense. It follows then that no modal can take a *ModalP* as a complement.⁵ This accounts for the uniqueness condition on modals. Ueda (2007) groups the elements in (4) under the category *Modal* in part because they are in complementary distribution. But given the analysis suggested here, it is no longer clear that they form a natural class. As shown in the subsequent sections, the complementizer *no* and the discourse particle *wa* *s*-select *T*, and hence, are in complementary distribution with the elements in (4). This, however, does not show that they belong to the category *Modal*. This state of affairs is expected under the bare phrase structure theory where there are no “fixed positions” for categories and Merge applies freely to two syntactic objects. It is simply that the formed structure must meet the requirements of morphology and *s*-selection, and this forces some elements to be in complementary distribution.

3 The Hierarchy of Japanese Complementizers

Japanese has three complementizers, *no*, *ka* and *to*, as illustrated in (19).

- (19) a. Taroo-wa [_{CP} Hanako-ga soko-ni i-ru no]-o sittei-ta
 Taroo-TOP Hanako-NOM there-in be-Pres. *no*-ACC know-Past
 'Taroo knew *that* Hanako was there'
- b. Taroo-wa [_{CP} Hanako-ga sono hon-o mottei-ru ka] siritagattei-ru
 Taroo-TOP Hanako-NOM that book-ACC have-Pres. *ka* want.to.know-Pres.
 'Taroo wants to know whether Hanako has that book'
- c. Taroo-wa [_{CP} Hanako-ga sono hon-o mottei-ru to] omottei-ru
 Taroo-TOP Hanako-NOM that book-ACC have-Pres. *to* think-Pres.
 'Taroo thinks that Hanako has that book'

These complementizers can co-occur as in (20), and when they do, they appear in the order

⁵ Two modals can appear, although not adjacently, in a structure like *V-v-(T)-Modal-(X)-V-v-(T)-Modal*. But the two modals belong to different clauses in this structure.

indicated.

- (20) Taroo-wa [_{CP} kare-no imooto-ga soko-ni i-ta (no) ka (to)] minna-ni tazune-ta
Taroo-TOP he-GEN sister-NOM there-at be-Past *no ka to* all-DAT inquire-Past
'Taroo asked everyone *if* his sister was there'

Given this, I proposed the hierarchy in (2), repeated in (21), in Saito (2009).

- (21) [_{CP} ... [_{CP} ... [_{CP} ... Finite (*no*)] Force (*ka*)] Report (*to*)]

(21) predicts that the complementizer sequences in (22a) are allowed while those in (22b) are not.

- (22) a. *no-ka, ka-to, no-ka-to*
b. **to-ka, ka-no, to-no, to-ka-no, ka-to-no*
c. **no-to*

There is, however, one sequence, *no-to* in (22c), that is consistent with the hierarchy in (21) and yet is illicit. Thus, (23) is ungrammatical.

- (23) *Taroo-wa [_{CP} kare-no imooto-ga soko-ni i-ru no to] kitaisi-ta
Taroo-TOP he-GEN sister-NOM there-at be-Pres. *no to* expect-Past
'Taroo expected his sister to be there'

The purpose of this section is to provide an explanation for the hierarchy in (21), and at the same time, to account for the exception in (22c).

It is necessary to consider the properties of each complementizer first in order to examine the source of their hierarchical relations. *Ka* is straightforward as it is the complementizer for questions. *No* and *to*, on the other hand, require some discussion. Let's consider *to* first.

To is ambiguous between a marker of direct quotation as in (24a) and a complementizer that embeds indirect discourse as in (24b).

- (24) a. Hanako-ga, "Watasi-wa tensai da," to it-ta /omot-ta (koto)
Hanako-NOM I-TOP genius be *to* say-Past/think-Past fact
'(the fact that) Hanako said/thought, "I'm an genius"'
b. Hanako-ga [zibun-ga tensai da to] it-ta /omot-ta (koto)
Hanako-NOM self-NOM genius be *to* say-Past/think-Past fact
'(the fact that) Hanako said/thought that she is an genius'

In the latter case, it has been widely assumed that *to* is employed for propositional complements as it appears when the matrix verb is a typical bridge verb like *iw* ‘say’ and *omow* ‘think’. However, I argued in Saito (2009) that *to* embeds a paraphrase or report of direct discourse. Plann (1982) shows that the Spanish complementizer *que* has this function. What I proposed is that *to* is specialized for this function. One piece of evidence is that the matrix verbs that s-select *to* are all verbs of saying and thinking, that is, verbs that are compatible with direct quotation. A partial list of those verbs is shown in (25).

- (25) *omo-u* ‘think’, *kangae-ru* ‘consider’, *sinzi-ru* ‘believe’, *i-u* ‘say’, *sakeb-u* ‘scream’,
syutyoosu-ru ‘claim, insist’, *tazune-ru* ‘inquire’, *kitaisu-ru* ‘expect, hope’,
kakuninsu-ru ‘confirm’, *kanzi-ru* ‘feel’ (all in present tense)

Secondly, *to* embeds various types of sentences just like *que*. *To* follows a question in (26a), imperative sentences in (26b-c), and an expression of invitation in (26d).⁶

- (26) a. Taroo-wa Ziroo-ni [_{CP} kanozyo-ga kare-no ie-ni ku-ru ka to] tazune-ta
 Taroo-TOP Ziroo-DAT she-NOM he-GEN house-to come-Pres. *ka to* ask-Past
 ‘Taroo asked Ziroo if she is coming to his house’
 b. Hanako-wa Taroo-ni [_{CP} kanozyo-no ie-ni i-ro to] meizi-ta
 Hanako-TOP Taroo-DAT she-GEN house-at be-Imp. *to* order-Past
 ‘Hanako ordered Taroo to be at her house’
 c. Hanako-wa Taroo-ni [_{CP} kanozyo-no ie-ni ik-u-na to] meizi-ta
 Hanako-TOP Taroo-DAT she-GEN house-to go-Pres.-don’t *to* order-Past
 ‘Hanako ordered Taroo not to go to her house’
 d. Hanako-wa Taroo-o [_{CP} kanozyo-no ie-ni ik-oo to] sasot-ta
 Hanako-TOP Taroo-ACC she-GEN house-to go-let’s *to* invite-Past
 ‘Hanako invited Taroo to go to her house’

This is unexpected if *to* is a complementizer for propositional complements. On the other hand, the examples in (26) should be grammatical if *to* embeds paraphrases of direct discourse. A direct discourse, and hence its paraphrase, can be a question, an order or an

⁶ Plann (1982) demonstrates that *que* can take a question CP as a complement when the matrix verb is a verb of saying or thinking. She argues, based on this fact, that *que* can embed a paraphrase of a quotation. Rivero (1994) shows in support of Plann’s analysis that *que* takes an imperative complement as well. The discussion of *to* in Saito (2009), thus, closely follows that of *que* in these two papers.

invitation, in addition to a simple statement.

Then, what is the complementizer for embedded propositions in Japanese? It is argued in Saito (2009) that *no* is employed for this purpose. (27) is a partial list of matrix verbs that take CP complements headed by *no*.

- (27) *wasure-ru* ‘forget’, *kookaisu-ru* ‘regret’, *mi-ru* ‘see’, *mat-u* ‘wait’, *tamera-u* ‘hesitate’,
kyohisu-ru ‘refuse’, *ukeire-ru* ‘accept’, *kitaisu-ru* ‘expect, hope’, *kakuninsu-ru*
‘confirm’, *kanzi-ru* ‘feel’ (all in present tense)

All of these verbs take complements that express events or actions. For example, what one forgets is an event or to perform an action. What one hesitates is to perform an action and what one waits for is for an event to happen. Then, they take propositional complements.

Matsumoto (2010) argues that *no* is a Finite head, a hypothesis originally proposed by Hiraiwa and Ishihara (2002). If *no* is the complementizer for propositions, it should in principle be able to embed a ModalP, as a ModalP can stand for a proposition. However, Matsumoto observes that *no* s-selects T and is incompatible with modals. This is shown in (28)-(29).

- (28) a. Taroo-wa [CP [TP ame-ga hur-u] no]-o kitaisi-ta
Taroo-TOP rain -NOM fall-Pres. *no*-ACC expect-Past
‘Taroo hoped that it would rain’
b. *Taroo-wa [CP [ModalP ame-ga hur-u daroo] no]-o kitaisi-ta
Taroo-TOP rain-NOM fall-Pres. will *no*-ACC expect-Past
‘Taroo hoped that it would rain’
- (29) a. Taroo-wa [CP [TP ame-ga hur-u] no]-o yosoosi-ta
Taroo-TOP rain-NOM fall-Pres. *no*-ACC predict-Past
‘Taroo predicted that it would rain’
b. *Taroo-wa [CP [ModalP ame-ga hur-u mai] no]-o yosoosi-ta
Taroo-TOP rain-NOM fall-Pres. won’t *no*-ACC predict-Past
‘Taroo predicted that it would not rain’

Finite, by definition, is closely related to Tense. Then, the fact that *no* s-selects T, Matsumoto (2010) argues, provides evidence that it is a Finite head.

Let us now consider the hierarchy in (21), repeated in (30), with this background.

- (30) [CP ... [CP ... [CP ... Finite (*no*)] Force (*ka*)] Report (*to*)

The fact that *no* occupies the lowest position in the hierarchy already follows from its s-selection requirement. As it s-selects T, it cannot take a CP complement. On the other hand, *ka* and *to* are not in selectional relation with any specific head. *Ka*, for example, merges with a syntactic object that stands for a proposition and creates a question. A proposition can be expressed as a *vP*, a TP, a ModalP or a CP. *Ka* can take a TP, a ModalP and a CP as its complement, as shown in (31).

- (31) a. Taroo-wa [CP [TP Hanako-ga soko-ni it-ta] ka] minna-ni tazune-ta
 Taroo-TOP Hanako-NOM there-to go-Past *ka* all-DAT ask-Past
 ‘Taroo asked everyone if Hanako went there’
- b. Taroo-wa [CP [ModalP Hanako-ga soko-ni ik-u daroo] ka] minna-ni tazune-ta
 Taroo-TOP Hanako-NOM there-to go-Pres. will *ka* all-DAT ask-Past
 ‘Taroo asked everyone if Hanako would go there’
- c. Taroo-wa [CP [CP Hanako-ga soko-ni it-ta no] ka] minna-ni tazune-ta
 Taroo-TOP Hanako-NOM there-to go-Past *no ka* all-DAT ask-Past
 ‘Taroo asked everyone if Hanako went there’

(31c) is the most relevant for the hierarchy in (30), which allows the *no-ka* sequence. As argued above, *no* is the complementizer for embedded propositions and a CP headed by *no* stands for a proposition. Hence, *ka* can merge with a *no*-headed CP as in (31c).

The merger of *vP* and *ka* should be possible on semantic grounds but is excluded by morphology. A verb stem is a dependent morpheme and requires a suffix such as tense. As *ka* cannot serve as an appropriate suffix for a verb stem, it cannot take a *vP* complement. Also, *ka* cannot combine with ModalPs and CPs that do not stand for propositions. Thus, the following examples are totally ungrammatical:

- (32) a. *Taroo-wa [CP [ModalP Hanako-ga soko-ni ik-e] ka] minna-ni tazune-ta
 Taroo-TOP Hanako-NOM there-to go-Imp. *ka* all-DAT ask-Past
- b. *Taroo-wa [CP [CP Hanako-ga soko-ni it-ta to] ka] minna-ni tazune-ta
 Taroo-TOP Hanako-NOM there-to go-Past *to ka* all-DAT ask-Past

The embedded ModalP in (32a) expresses an order, and the embedded *to*-headed CP in (32b) a paraphrase of direct discourse. These are examples of semantic incompatibility as *ka* requires a complement that stands for a proposition. (32b), in particular, illustrates why the complementizer sequence *to-ka* is impossible.

It was shown so far why *no-ka* is possible whereas *ka-no* and *to-ka* are not. It is necessary to review the property of *to* in order to examine the other combinations. It was argued above that *to* embeds a paraphrase of direct discourse. This complementizer, like *ka*, does not s-

select any specific head, and can combine with various types of clauses as long as its semantic requirement is satisfied. It was already shown in (19c) and (26) that *ka* can take a TP, a CP and a ModalP as its complement. Most relevant in the present context is (26a), repeated below as (33).

- (33) Taroo-wa Ziroo-ni [_{CP}[_{CP} kanozyo-ga kare-no ie-ni ku-ru ka] to] tazune-ta
 Taroo-TOP Ziroo-DAT she-NOM he-GEN house-to come-Pres. *ka to* ask-Past
 ‘Taroo asked Ziroo if she is coming to his house’

As the paraphrased direct discourse can be a question, *to* can take a question CP as its complement. A direct discourse, or an utterance, can express a statement, an assertion, a question, an order, and the like. It is then not surprising that *to* can embed various types of clauses. Outstanding in this context is the ungrammaticality of (23), repeated below as (34).

- (34) *Taroo-wa [_{CP} kare-no imooto-ga soko-ni i-ru no to] kitaisi-ta
 Taroo-TOP he-GEN sister-NOM there-at be-Pres. *no to* expect-Past
 ‘Taroo expected his sister to be there’

This example indicates that *to* cannot take a *no*-headed CP as its complement. Recall here that *no*-headed CPs stand for propositions, and express events, states, actions and the like. Then, they cannot be construed as paraphrases of direct discourse. The *no-to* sequence is illicit also because of semantic incompatibility.

In this section, I argued that the hierarchical relation among the complementizers, *no*, *ka* and *to*, follows from the s-selection requirement of *no* and the semantics of those complementizers. *No*, which is the complementizer for embedded propositions, s-selects T. Hence, it occupies the lowest position in the hierarchy. *Ka* merges with clauses that stand for propositions and creates questions. Hence, the *no-ka* sequence is possible. *To* embeds paraphrases of direct discourse. Since the paraphrased direct discourse can be a question, the *ka-to* sequence is also possible. This covers all the possible combinations, *no-ka*, *ka-to*, and *no-ka-to*. On the other hand, the *ka-no* and *to-no* sequences are both in conflict with the s-selection requirement of *no*. The *to-ka* sequence is ruled out because a *to*-headed CP does not stand for a proposition. Thus, the hierarchy in (30) is precisely what is expected. The only exception to the hierarchy is that the *no-to* sequence is illicit. This fact too receives an account because a *no*-headed CP cannot express a paraphrase of direct discourse. In the following section, I turn to the distributions of sentence-final discourse particles, another phenomenon for which a hierarchy is proposed.

4 Discourse Particles and Speech Act Compatibility

Japanese is rich in sentence-final particles. Endo (2010) discusses four of them in some detail; *wa*, *yo*, *ne* and *na*. Roughly speaking, the first two are employed for assertion, and the latter two for solicitation of response. As Endo observes, their distributions are quite interesting because some of them can co-occur but only in a fixed order. For example, (35) contains three particles, and they must appear in the order indicated.

- (35) Hanako-wa soko-ni i-ta (wa) (yo) (ne)
Hanako-TOP there-at be-Past *wa yo ne*
'Hanako was there'

In this section, I will investigate the source of this hierarchy.⁷ I will first discuss the properties of these particles, and then, suggest that the hierarchy, to a large extent, stems from the specific speech acts they convey.

First, as Haraguchi (2012) shows, these particles are genuine discourse elements whose distributions are confined to matrix contexts. Thus, they cannot occur even within *to*-headed CPs, which embed various types of clauses as observed above.

- (36) a. Hanako-wa [_{CP} Taroo-wa kanozyo-no ie-ni i-ru (*wa) to] omot-ta
Hanako-TOP Taroo-TOP she-GEN house-at be-Pres. *wa to* think-Past
'Hanako thought that Taroo is at her house'
b. Hanako-wa [_{CP} Taroo-ga kanozyo-o tasukete kure-ru (*yo) to] kitaisi-ta
Hanako-TOP Taroo-TOP she-ACC help (for her)-Pres. *yo to* expect-Past
'Hanako expected Taroo to help her'

Nevertheless, *wa*, in particular, has an s-selection requirement. It takes a TP complement as shown in (37).⁸

- (37) a. Watasi-wa soko-ni ik-u wa / it-ta wa
I-TOP there-to go-Pres. *wa* go-Past *wa*
'I will go there / I went there'
b. Taroo-wa yasasi-i wa / yasasi-katta wa
Taroo-TOP kind-Pres. *wa* kind-Past *wa*
'Taroo is kind / Taroo was kind'

⁷ The content of this section is based on joint research with Tomoko Haraguchi, which is reported in more detail in Saito and Haraguchi (2012).

⁸ *Wa* is typically employed in women's speech.

Wa follows verbal tenses (*ru/ta*) in (37a) and adjectival tenses (*ikatta*) in (37b).

On the other hand, *wa* cannot merge with a CP or a ModalP. (38a) shows that *wa* is incompatible with a CP complement, and (38b-c) that it cannot take a ModalP as its complement.

- (38) a. Taroo-wa soko-ni ik-u no (*wa)
Taroo-TOP there-to go-Pres. *no wa*
'Taroo will go there'
- b. Taroo-wa soko-ni ik-e (*wa)
Taroo-TOP there-to go-Imp. *wa*
'Taroo, go there'
- c. Hanako-wa ku-ru desyoo (*wa)
Hanako-TOP come-Pres. will *wa*
'Hanako will come'

Then, *wa* s-selects T. This predicts that *wa* must occupy the lowest position in a sequence of discourse particles. It indeed cannot follow any discourse particle, as shown in (39).

- (39) a. Hanako-wa soko-ni i-ta yo (*wa)
Hanako-TOP there-at be-Past *yo wa*
'Hanako was there'
- b. Hanako-wa soko-ni i-ta ne (*wa)
Hanako-TOP there-at be-Past *ne wa*
'Hanako was there, wasn't she?'

Although *yo* is also employed for assertion, it exhibits a different distribution. It allows various clause types as its complement, and as Tenny (2006) notes, it can be translated roughly as 'I'm telling you ...'. It takes TP complements in (40) and ModalP complements in (41).

- (40) a. Taroo-wa soko-ni i-ru yo / i-ta yo
Taroo-TOP there-at be-Pres. *yo be-Past yo*
'Taroo is there / was there'
- b. Taroo-wa yasasi-i yo / yasasi-katta yo
Taroo-TOP kind-Pres. *yo kind-Past yo*
'Taroo is kind / was kind'

- (41) a. Taroo-wa soko-ni ik-e / ik-inasai yo
 Taroo-TOP there-to go-Imp. go-Imp. yo
 ‘Taroo, go there’
- b. Soko-ni ik-oo / ik-imasyoo yo
 there-to go-Inv. go-Inv. yo
 ‘Let’s go there’

The examples in (42) show that *yo* can follow the complementizer *no* and the discourse particle *wa*.

- (42) a. Hanako-wa soko-ni i-ru no yo
 Hanako-TOP there-at be-Pres. no yo
 ‘Hanako is there’
- b. Hanako-wa soko-ni i-ru wa yo
 Hanako-TOP there-at be-Pres. wa yo
 ‘Hanako is there’

Yo clearly does not have any s-selection requirement, and given this, it is not surprising that it can follow another discourse particle.

Na and *ne*, which solicit response, are similar to *yo* in distribution. Here, I will provide some examples of *ne*.

- (43) a. Taroo-wa yasasi-i ne
 Taroo-TOP kind-Pres. ne
 ‘Taroo is kind, isn’t he?’
- b. Taroo-wa soko-ni ik-inasai ne
 Taroo-wa there-to go-Imp. ne
 ‘Taroo, go there. Will you?’
- c. Soko-ni ik-imasyoo ne
 there-to go-let’s ne
 ‘Let’s go there. Shall we?’
- d. Taroo-wa yasasi-i no ne
 Taroo-TOP kind-Pres. no ne
 ‘Taroo is kind, isn’t he?’
- e. Taroo-wa yasasi-i wa ne
 Taroo-TOP kind-Pres. wa ne
 ‘Taroo is kind, isn’t he?’

What appears in the complement position of *ne* is a TP in (43a), a ModalP in (43b-c), a CP in (43d), and a sentence headed by the speech act particle *wa* in (43e). Thus, *ne* does not s-select a specific head, either.

As Keiko Murasugi observes, there is clear evidence that *wa* and the other discourse particles differ in selectional properties. *Yo*, *ne* and *na* can appear not only sentence-finally but after any major constituent. (44) illustrates this with *ne*.

- (44) Taroo-ga ne soko-ni ne i-te ne ...
 Taroo-NOM *ne* there-at *ne* be-and *ne*
 ‘It’s Taroo, alright? It’s there, alright? He was there, alright? And, ...’

This is consistent with the proposal that *ne* does not s-select any head. *Wa*, on the other hand, cannot be employed in this way as it s-selects T.

Nevertheless, there are restrictions on the complements of *yo*, *ne* and *na*. For example, *ne* and *na* can follow *yo*, but *yo* cannot follow them. Further, *ne* and *na* are mutually exclusive. Relevant examples are shown in (45)-(46).

- (45) a. Hanako-wa soko-ni i-ta yo ne/na
 Hanako-NOM there-at be-Past *yo ne/na*
 Hanako was there, wasn’t she?
 b. *Hanako-wa soko-ni i-ta ne/na yo
 Hanako-NOM there-at be-Past *ne/na yo*

- (46) a. *Hanako-wa soko-ni i-ta ne na
 Hanako-NOM there-at be-Past *ne na*
 Hanako was there, wasn’t she?
 b. *Hanako-wa soko-ni i-ta na ne
 Hanako-NOM there-at be-Past *na ne*
 Hanako was there, wasn’t she?’

Then, descriptively, the hierarchy in (47) obtains.

- (47) [[[TP *wa*] *yo*] *ne/na*]

As argued above, *wa* must occupy the lowest position because it s-selects T. In the remainder of this section, I will suggest that the rest should be accounted for in terms of the speech acts these particles yield.

First, *yo* is employed for assertion, and hence, its complement must be capable of

expressing an assertion. The following examples demonstrate this:

- (48) a. [_{CP} Dare-ga soko-ni ik-u ka] yo
who-NOM there-to go-Pres. *ka yo*
'Who will go there? = No one will go there'
- b. [_{CP} Taroo-ni nani-ga deki-ru ka] yo
Taroo-DAT what-NOM can.do-Pres. *ka yo*
'What can Taroo do? = Taroo can't do anything'

A question can be interpreted at the discourse level as a literal question or as a rhetorical question. However, when a question is embedded under *yo* as in (48), only the rhetorical question interpretation survives. This is expected because a rhetorical question expresses an assertion while a literal question does not. The situation is different with *ne* and *na*, which solicit response. (49a-b), unlike (48a-b), retain the ambiguity.

- (49) a. [_{CP} Dare-ga soko-ni ik-u ka] ne
who-NOM there-to go-Pres. *ka ne*
'Who will go there? / (I think) no one will go there. What do you think?'
- b. [_{CP} Taroo-ni nani-ga deki-ru ka] ne
Taroo-DAT what-NOM can.do-Pres. *ka ne*
'What can Taroo do? / (I think) Taroo can't do anything. What do you think?'

This should be because a response can be solicited on a question or an assertion.

Given the observation above, it is not at all surprising that the *yo-ne/na* sequence is allowed whereas the *ne/na-yo* sequence is not. *Yo* combines with an expression of assertion and reinforces the speech act. It is then possible to solicit a response on the assertion by placing *ne/na* after *yo*. On the other hand, *ne/na* adds the speech act of soliciting a response. A sentence with these particles is in fact best translated as a tag question. But it was shown above that the complement of *yo* cannot express a literal question for the simple reason that a question cannot be asserted. Thus, the hierarchical relation between *yo* and *ne/na* is predicted from their discourse roles.

The final question to be addressed is why *ne* and *na* cannot co-occur, as was shown in (46). Although I do not have a clear-cut answer for this, I would like to make a suggestion, based on an observation in Endo (2010). Endo notes that *na* is appropriate when talking to oneself whereas *ne* is not. Let's compare the following two examples:

- (50) a. Dekake-ta na
 go.out-Past *na*
 ‘It looks like she/he went out’
- b. Dekake-ta ne
 go.out-Past *ne*
 ‘You/she/he went out, didn’t you/he/she?’

Suppose that you go home alone and find that your roommate is not there. Then, you could utter (50a), talking to yourself. (50b) is inappropriate in this context. On the other hand, suppose that you go home with your friend. Then, you could say (50b) to your friend, referring to your roommate. Or (50b) can be addressed to your roommate when she/he comes home. This suggests that *na* solicits a response from the discourse participants including the speaker, while *ne* seeks a response from those excluding the speaker. *Na* can be employed when talking to oneself, as there is a discourse participant to whom the utterance can be addressed, namely, the speaker. *Ne* has no function in this context. If this characterization of *ne* and *na* is correct, then they should be mutually exclusive because their discourse functions are not compatible.

5 Conclusion

As discussed in this paper, constraints and hierarchies have been proposed and entertained in the recent investigation of the Japanese right periphery. Ueda (2007) examines Japanese modals in detail and entertains the constraint that a clause can contain at most one modal. Saito (2009) observes the hierarchy of Japanese complementizers in (30), repeated below in (51).

- (51) [CP ... [CP ... [CP ... Finite (*no*)] Force (*ka*)] Report (*to*)

Endo (2010), on the other hand, examines the hierarchy of discourse particles, which can be formulated as in (52).

- (52) [[[TP *wa*] *yo*] *ne/na*]

These constitute facts to be explained.

In this paper, I explored the possibility that they are consequences of the properties of the relevant lexical items. In Section 2, I showed that Japanese modals are either suffixes or s-select T, and argued that the uniqueness condition follows from these lexical properties. In Section 3, I argued that the hierarchy of complementizers in (51) is a consequence of the s-

selection requirement of *no* and the semantics of the complementizers. Finally, in Section 4, I suggested that the discourse particles are hierarchically organized as in (52) because *wa* selects T and any other ordering of *yo*, *ne* and *na* causes a contradiction in the composite speech act. These accounts need to be made more precise in future research. But they suggest that there is no need to postulate constraints or hierarchies for Japanese phrase structure as the relevant facts are derivable from lexical properties. This is in line with the Minimalist hypothesis that all that is required for phrase structure building is the minimal operation, Merge.

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Remnant Movement, Radical Reconstruction, and Binding Relations¹

Mamoru Saito

1. Introduction

Two major properties of Japanese scrambling are listed in (1).

- (1) a. A remnant created by scrambling can never move.
- b. A phrase preposed by scrambling is subject to radical (total) reconstruction.

(1a) was motivated initially by the fact that remnant movement of the form in (2) is always illicit.

- (2) * $[\beta \dots t_i \dots]_j [\dots \alpha_i [\dots t_j \dots] \dots]$, where α and β are preposed by scrambling.

In Saito (1985), I proposed to account for this in terms of Fiengo's (1977) proper binding condition, which requires that traces be bound. On the other hand, I argued in Saito (1989) for (1b), which implies that scrambling need not be represented at LF. If this is correct, (3a) can have the LF in (3b) as if scrambling never applied.

- (3) a. $\alpha_i [\dots t_i \dots]$, where α is preposed by scrambling.
- b. $[\dots \alpha \dots]$

This raises questions on the proper binding analysis of (2) if the condition applies at LF. With total reconstruction, the LF of (2) can be as in (4), where there is no trace and hence, clearly no violation of the proper binding condition.

- (4) $[\dots [\beta \dots \alpha \dots] \dots]$

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Given this situation, a number of alternative analyses for (2) have been proposed in the literature. Among them is Takita's (2010) PF analysis. He adopts the theory of linearization proposed by Fox and Pesetsky (2005) and developed by Ko (2007), and demonstrates that it explains (1a). He then goes on to argue that the proper binding condition can be totally eliminated from the syntax.

The purpose of this paper is to examine the issues raised by (1a) and (1b) further. In the first part of the paper, I present supporting evidence for Takita's (2010) PF approach to (2) and for his claim that there are no syntactic constraints on the movement of remnants created by Japanese scrambling. I argue in addition that the same piece of evidence, interestingly, provides strong support for (1b). Then, in the latter part of the paper, I explore some issues related to (1b). First, I consider the fact that movement creates new binding possibilities as in (5).

(5) *John wonders which picture of himself Mary liked*

As demonstrated by DeJima (1999) and others, Japanese scrambling exhibits the same effect. Given total reconstruction of scrambling, this poses a problem for the hypothesis that the Binding theory applies at LF. I assume Quicoli's (2008) phase-based Binding theory, and show that the theory, with a refinement on the interpretive mechanism of chains, accommodates examples of this kind, that is, both (5) and its scrambling counterpart. Then, I suggest that the theory leads to an explanation for the anti-reconstruction property of English wh-phrases in situ. (6) illustrates this property.

(6)?? [*Which picture of whom*]_j does John wonder who_i t_i bought t_j

This example can only be interpreted as a matrix multiple wh-question with *whom* taking matrix scope, and does not allow the wh-phrase to have embedded scope. The precise account for this is unclear if *picture of whom* or *of whom* reconstructs at LF as widely assumed. I suggest that the phase-based interpretation of chains employed in the analysis of (5) and its scrambling counterpart leads to a solution for this problem.

In the following section, I briefly review the proposals on (2), including Saito's (1985) in terms of the proper binding condition, Kitahara's (1997) based on Attract, and Takita's (2010) in terms of linearization. Then, in Section 3, I present and discuss supporting evidence for Takita's approach. Section 4 concerns examples such as (5) and its scrambling counterpart. There, I suggest a refinement of Quicoli's (2008) theory with a phase-based interpretation of chains. In Section 5, I discuss the problem (6) poses in some detail, and suggest that it is resolved by the analysis presented in Section 4. Section 6 concludes the paper.

2. Proper Binding Effects with Japanese Scrambling

In Saito (1985), I argued that Japanese scrambling is nothing but an instance of Move- α (Move anything anywhere). This necessitated the demonstration that the illicit cases of scrambling are ruled out by independent principles. Examples of the following kind, which instantiate (2), were considered in this context:

- (7) * $[[_{CP} \text{Hanako-ga } t_i \text{ iru to}]_j [_{TP} \text{Taroo-ga } t_j \text{ omotteiru}]]$ (*koto*)
 Hanako-NOM be C Seoul-in Taroo-NOM think fact
 ‘[That Hanako is t_i]_j, in Seoul_i, [Taroo thinks t_j]_j’
 (= ‘Taroo thinks that Hanako is in Seoul’)

This example can be derived from (8a) by first scrambling *Sooru-ni* ‘Seoul-in’ out of the embedded CP as in (8b) and then scrambling the embedded CP itself to the initial position of the matrix clause.

- (8) a. $[_{TP} \text{Taroo-ga } [_{CP} \text{Hanako-ga } \text{Sooru-ni iru to}] \text{ omotteiru}]$ (*koto*)
 Taroo-NOM Hanako-NOM Seoul-in be C think fact
 ‘Taroo thinks that Hanako is in Seoul’
 b. $[_{TP} \text{Sooru-ni } [_{TP} \text{Taroo-ga } [_{CP} \text{Hanako-ga } t_i \text{ iru to}] \text{ omotteiru}]]$ (*koto*)
 Seoul-in Taroo-NOM Hanako-NOM be C think fact
 ‘In Seoul_i, Taroo thinks that Hanako is t_i ’

The derivation should be allowed because (8b) is grammatical and further, CP scrambling and multiple scrambling are both possible as illustrated in (9a) and (9b) respectively.

- (9) a. $[[_{CP} \text{Hanako-ga } \text{Sooru-ni iru to}]_i [_{TP} \text{Taroo-ga } t_i \text{ omotteiru}]]$ (*koto*)
 Hanako-NOM Seoul-in be C Taroo-NOM think fact
 ‘[That Hanako is in Seoul]_i, Taroo thinks t_i ’
 b. $[_{TP} \text{Sono hon-o}_i [_{CP} \text{Hanako-ni}_j [_{TP} \text{Taroo-ga } [_{CP} \text{Ziroo-ga } t_j t_i \text{ watasita to}] \text{ omotteiru}]]]$ (*koto*)
 that book-ACC Hanako-DAT Taroo-NOM Ziroo-NOM
 handed C think fact
 ‘That book_i, to Hanako_j, Taroo thinks that Ziroo handed $t_i t_j$ ’
 (= ‘Taroo thinks that Ziroo handed that book to Hanako’)

What I proposed in Saito (1985) is that (7) is ruled out by the proper binding condition, which prohibits unbound traces (Fiengo 1977). In this example, the trace of *Sooru-ni* ‘Seoul-in’ is in

violation of this condition.

The analysis of (7) just mentioned implies that there is a constraint that prohibits remnant movement, i.e., the proper binding condition. However, as noted above, the radical reconstruction property of Japanese scrambling raises doubts on this analysis. In this section, I first illustrate this problem and then introduce the alternative analyses for (7) proposed by Kitahara (1997) and Takita (2010). I present supporting evidence for the latter in the following section.

Let us first consider the following examples, which provide the necessary background to illustrate the radical reconstruction property:

- (10) a. $[_{TP} \text{Taroo-ga } [_{CP} [_{TP} \text{dare-ga } \text{sono hon-o } \text{katta}] \text{ka}] \text{siritagatte iru}]$
 Taroo-NOM who-NOM that book-ACC bought Q want to know
 (*koto*)
 fact
 ‘[Taroo wants to know [Q [who bought that book]]]’
 (= ‘Taroo wants to know who bought that book’)
- b. * $[_{TP} \text{Dare-ga } [_{CP} [_{TP} \text{Taroo-ga } \text{sono hon-o } \text{katta}] \text{ka}] \text{siritagatteiru}]$
 who-NOM Taroo-NOM that book-ACC bought Q want to know
 (*koto*)
 fact
 ‘[Who wants to know [Q [Taroo bought that book]]]’ (Harada 1972)

(10a) is a straightforward example with an embedded wh-question. The wh-phrase *dare* ‘who’ is contained within the question sentence, and the example is grammatical. (10b), on the other hand, is totally ungrammatical. In this example, *dare* is not contained within the question sentence it should be interpreted with. Given this contrast, Harada (1972) proposed the following generalization:

- (11) A wh-phrase must be contained within the CP where it takes scope.

This generalization applies to English as well, as shown in (12).

- (12) a. $Who_i t_i \text{ wonders } [which \text{ picture of whom}]_j \text{ Mary bought } t_j$
 b. ?? $[Which \text{ picture of whom}]_i \text{ does John wonder } who_j t_j \text{ bought } t_i$

As van Riemsdijk and Williams (1981) point out, (12a) is ambiguous. The wh-elements that moved to Spec, CP take scope at their surface positions. Thus, *who* takes matrix scope and *which* takes embedded scope. But *whom*, which was only pied-piped to the embedded Spec,

CP, can take either embedded or matrix scope. This is consistent with (11) because the *wh*-phrase is contained within the embedded CP as well as the matrix CP. Although (12b) is a Subjacency violation and hence is marginal, its interpretive property is clear. This example is not ambiguous, in contrast with (12a). *Whom*, which was pied-piped to the matrix Spec, CP, can only take matrix scope. This too is consistent with (11) because *whom* in this example is contained only in the matrix CP.²

With this background, let us now consider the examples in (13).

- (13) a. $[_{TP} \text{Taroo-ga } [_{CP} [_{TP} \text{Hanako-ga } \textit{dono hon-o } \textit{yonda}] \textit{ka}]$
 Taroo-NOM Hanako-NOM which book-ACC read Q
 siritagatteiru] (*koto*)
 want to know fact
 ‘[Taroo wants to know [Q [Hanako read which book]]]’
 (= ‘Taroo wants to know which book Hanako read’)
- b. $[_{CP} \textit{dono hon-o}_i [_{TP} \text{Taroo-ga } [_{CP} [_{TP} \text{Hanako-ga } t_i \textit{yonda}] \textit{ka}]$
 which book-ACC Taroo-NOM Hanako-NOM read Q
 siritagatteiru] (*koto*)
 want to know fact
 ‘[Which book_i, Taroo wants to know [Q [Hanako read *t*_i]]]’
 (= ‘Taroo wants to know which book Hanako read’)

(13a), like (10a), is a straightforward example with an embedded *wh*-question. In (13b), the *wh*-phrase *dono hon* ‘which book’ is scrambled out of the embedded question CP. The example is not only grammatical but also receives the same interpretation as (13a). This is unexpected because the *wh*-phrase is not contained within the question CP, just as in the totally ungrammatical (10b). I proposed then in Saito (1989) that a scrambled phrase can be placed back to its initial position before it receives interpretation at LF. This came to be called ‘radical reconstruction’ so that it is distinguished from ‘partial reconstruction’, which applies to the pied-piped elements in operator movement. It makes (13b) consistent with (11) if the generalization applies at LF. *Dono hon* in (13b), if it is reconstructed to the embedded object position, is contained within the embedded question CP at LF.

The same argument for radical construction can be constructed on the basis of (14).

² (12b) raises an interesting question as noted in Section 1. In the present context, if (11) holds at LF and *picture of whom* or *of whom* is reconstructed at this level, it is not obvious why the embedded scope of *whom* is disallowed. This question is discussed in Section 5.

- (14) a. $[_{TP} \text{Taroo-ga } [_{CP} [_{TP} \text{minna-ga } [_{CP} \text{Hanako-ga } \text{dono hon-o } \text{yonda to}] \text{ Taroo-NOM all-NOM Hanako-NOM which book-ACC read C } \text{omotteiru}] \text{ ka}] \text{ siritagatteiru}] \text{ (koto)}$
 think Q want to know fact
 ‘[Taroo wants to know [Q [everyone thinks [that Hanako read which book]]]]’
 (= ‘Taroo wants to know which book everyone thinks that Hanako read’)
- b. ? $[[_{CP} \text{Hanako-ga } \text{dono hon-o } \text{yonda to}]_i [_{TP} \text{Taroo-ga } \text{Hanako-NOM which book-ACC read C Taroo-NOM } [_{CP} [_{TP} \text{minna-ga } t_i \text{ omotteiru}] \text{ ka}] \text{ siritagatteiru}]] \text{ (koto)}$
 all-NOM think Q want to know fact
 ‘[[[That Hanako read which book]_i, Taroo wants to know [Q [everyone thinks t_i]]]’
 (= ‘Taroo wants to know which book everyone thinks that Hanako read’)

(14a) is like (13a) but the wh-phrase is further embedded in an additional CP. (14b) is derived by scrambling the most deeply embedded CP to the matrix initial position. The wh-phrase is no longer contained within the question CP because of this scrambling, and yet, the example is only slightly marginal. This too is expected if the scrambled CP is reconstructed to its initial position at LF.

As I discussed in detail in Saito (1989), the radical reconstruction property of scrambling has implications for the proper binding account for (7), repeated below as (15).

- (15) * $[[_{CP} \text{Hanako-ga } t_i \text{ iru to}]_j [_{Sooru-ni}_i [_{TP} \text{Taroo-ga } t_j \text{ omotteiru}]]] \text{ (koto)}$
 Hanako-NOM be C Seoul-in Taroo-NOM think fact
 ‘[[That Hanako is t_i]_j, in Seoul_i, [Taroo thinks t_j]]’
 (= ‘Taroo thinks that Hanako is in Seoul’)

If the scrambled CP in (15) is reconstructed, then there is no unbound trace at LF. And if *Sooru-ni* ‘Seoul-in’ is also reconstructed, there is no trace at all at the level. The conclusion of Saito (1989) was that the proper binding condition applies at S-structure. But this cannot be maintained under the Minimalist approach, where S-structure is dispensed with as a level of representation. Thus, an alternative account for (15) becomes necessary.

Kitahara (1997) was the first to suggest an alternative analysis for examples such as (15). His aim was to propose an explanation for Müller’s (1996) generalization, shown in (16).

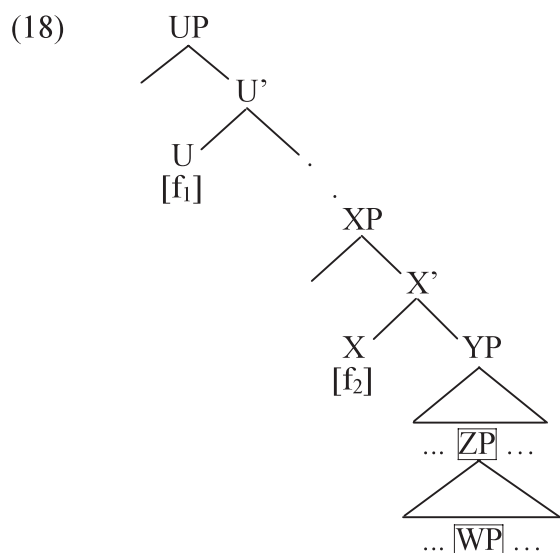
- (16) A phrase containing a trace of movement cannot undergo movement of the same type (operator movement, scrambling, NP-movement).

(16) states that remnant movement is illicit if it is of the same type as the movement that produced the trace in the remnant. The following English examples illustrate the generalization:

- (17) a. **[Which picture of t_i]_j* does John wonder *who_i Mary liked t_j*
 b. *[How likely [t_i to win]]_j is John_i t_j*

(17a) is ungrammatical because the movement of *[which picture of t_i]* and the movement of *who_i* are both operator movement. (17b), on the other hand, is allowed because the remnant *[how likely [t_i to win]]* undergoes operator movement whereas t_i is produced by NP movement.

Kitahara (1997) argues that the generalization follows from the minimal link condition or Attract. Let us consider the configuration in (18).



Remnant movement obtains if f_2 attracts WP to Spec, XP and f_1 attracts the remnant ZP to Spec, UP. Suppose that WP and ZP undergo the same type of movement. Then, f_1 and f_2 are the same feature, and both WP and ZP qualify as the target for this feature. Consequently, f_2 should attract the closest ZP and should never be able to attract WP over ZP. Hence, Müller's (1996) generalization follows. Nothing prevents the attraction of WP by f_2 if WP and ZP undergo difference types of movement and hence, f_1 and f_2 are distinct features. Kitahara (1997) then suggests that the ungrammatical (15) may be explained in the same way because it is derived by two applications of scrambling and falls under Müller's generalization.

Although Kitahara's (1997) suggestion is quite attractive, I raised a couple of questions in Saito (2003). First, the account he suggested for (15) implies that Japanese scrambling is

feature-driven, but this, I argued, is dubious.³ Secondly, a similar prohibition on remnant movement is observed even in cases that do not fall under Müller’s generalization. (19) illustrates this.

- (19) * $[_{TP} [PRO\ t_i\ iku\ koto]-ga_j\ Sooru-made_i\ Taroo-ni\ t_j\ meizirareta]$
 go N-NOM Seoul-to Taroo-DAT ordered-was
 ‘[To go t_i]_j, to Seoul_i, was ordered Taroo t_j ’
 (= ‘It was ordered Taroo to go to Seoul’)

This example is derived from (20a) by first scrambling *Sooru-made* ‘Seoul-to’ out of the control complement to the position following the matrix subject as in (20b).

- (20) a. *Hanako-ga Taroo-ni [PRO Sooru-made iku koto]-o meizita*
 Hanako-NOM Taroo-DAT Seoul-to go N-ACC ordered
 ‘Hanako ordered Taroo to go to Seoul’
 b. *Hanako-ga Sooru-made_i Taroo-ni [PRO t_i iku koto]-o meizita*
 Hanako-NOM Seoul-to Taroo-DAT go N-ACC ordered
 ‘Hanako, to Seoul_i, ordered Taroo to go t_i ’
 c. $[PRO\ Sooru-made\ iku\ koto]-ga_j\ Taroo-ni\ t_j\ meizirareta$
 Seoul-to go N-NOM Taroo-DAT ordered-was
 ‘[To go to Seoul]_j was ordered Taroo t_i ’

The control complement in (20a, b) is headed by a formal noun *koto* and is the object of the sentence. Because of this, it can move to the subject position once the sentence is passivized. (20c) is a passive counterpart of (20a). (19) obtains when (20b) is passivized in the same way. This example is derived by scrambling and NP-movement, and hence does not fall under Müller’s generalization. Yet, it is completely ungrammatical just like (15). It seems then that Kitahara’s (1997) suggestion does not quite succeed in accounting for the relevant facts.⁴

Another proposal to explain the proper binding phenomenon of traces produced by scrambling is made in Takita (2010). His analysis adopts the theory of linearization proposed by Fox and Pesetsky (2005) and developed by Ko (2007). The basic idea is that the linear

³ Note that the radical reconstruction property by itself raises doubts on the feature-based analysis of Japanese scrambling. If scrambling is feature driven, the sole function of the relevant feature must be to trigger scrambling and the feature must be void of any semantic content. See Kawamura (2004) for detailed discussion on this point.

⁴ It is desirable to pursue an alternative to Kitahara’s (1997) analysis on conceptual grounds as well if Chomsky’s (2008, 2013) proposal is adopted to dispense with Attract and assume that internal Merge, like external Merge, freely applies and simply forms a constituent out of two elements.

order of constituents is fixed at each spell-out domain. Ko (2007), in particular, demonstrates that the theory provides a solution to an outstanding problem in Japanese/Korean syntax. I first illustrate the theory by way of presenting Ko’s analysis.

Kuroda (1980) examines the distribution of floating numeral quantifiers in Japanese and presents an argument for scrambling as a movement operation. In (21a, b), numeral quantifiers occur adjacent to the noun phrases they modify.

- (21) a. *Gakusei-ga san-nin sake-o nonda*
 student-NOM 3-person sake-ACC drank
 ‘Three students drank sake’
 b. *Gakusei-ga sake-o san-bon nonda*
 student-NOM sake-ACC 3-bottle drank
 ‘A student drank three bottles of sake’

The marginality of (22) indicates that the adjacency is indeed required of numeral quantifiers.

- (22) ??*Gakusei-ga sake-o san-nin nonda*
 student-NOM sake-ACC 3-person drank
 ‘Three students drank sake’

However, Kuroda notes that (23a) is perfectly grammatical even though the subject intervenes between *sake* and *san-bon* ‘three-bottle’.

- (23) a. *Sake-o gakusei-ga san-bon nonda*
 sake-ACC student-NOM 3-bottle drank
 ‘A student drank three bottles of sake’
 b. [object_i [TP subject [VP t_i 3-bottle drank]]]

He then argues that (23a) is derived as in (23b) by scrambling, and the example is grammatical because the adjacency holds between the trace of the object and the numeral quantifier.

Kuroda’s argument is persuasive, but one question remains in the analysis. That is, it is not clear why (22) cannot be derived by multiple scrambling as in (24).

- (24) [subject_j [object_i [TP t_j 3-person [VP t_i drank]]]]

The question is amplified with the VP-internal subject hypothesis. (22) can then be derived by simply scrambling the object to the edge of vP as in (25).

(25) $[_{TP} \text{subject}_i [_{vP} \text{object}_j [t_i \text{3-person} [_{VP} t_j \text{drank}]]]]]$

Ko (2007) shows that Fox and Pesetsky's (2005) theory of linearization provides a solution to this problem. The basic idea of the theory, as noted above, is that the relative word order is fixed once and for all at each spell-out domain, and Ko assumes that vP is a spell-out domain in Korean and Japanese. Then, in the absence of scrambling, the subject-object-verb order is established as vP is spelled out. This is illustrated in (26a).

- (26) a. $[_{vP} \text{subject} [_{VP} \text{object V}]] \dots \text{subject} < \text{object} < \text{verb}$
 b. $[_{vP} \text{object}_i [\text{subject} [_{VP} t_i V]]] \dots \text{object} < \text{subject} < \text{verb}$

If the object is to precede the subject, it must be preposed to the edge of vP before spell-out as in (26b). In either case, the order established at vP must be maintained throughout the derivation. Given this, let us reconsider (25), which must be excluded to account for the ungrammaticality of (22). There are two possibilities at the point vP is spelled out.

- (27) a. $[_{vP} \text{subject 3-person} [_{VP} \text{object V}]] \dots \text{subject} < \text{3-person} < \text{object} < \text{verb}$
 b. $[_{vP} \text{object}_i [\text{subject 3-person} [_{VP} t_i V]]] \dots \text{object} < \text{subject} < \text{3-person} < \text{verb}$

(27a) obtains if the object is not scrambled to the edge of vP , and (27b) if it is. Neither yields the order $\text{subject} < \text{object} < \text{3-person} < \text{verb}$. Consequently, if the derivation continues to yield the structure in (24) or (25), a contradiction with linearization arises. Thus, these structures are successfully ruled out.⁵

What Takita (2010) points out is that Ko's (2007) analysis outlined above automatically rules out the illicit examples of "proper binding violations." Let us consider again (15) and (19), repeated below as (28a, b).

⁵ This account presupposes that the subject cannot be moved across the object to the outer edge of vP as in (i).

(i) $[_{vP} \text{subject}_j [\text{object}_i [t_j \text{3-person} [_{VP} t_i V]]]]]$

In (i), the subject originates in Spec, vP and moves to a higher Spec, vP . Ko (2007) assumes that this type of movement is impossible because movement is attraction by a head. Spec is not included in the search domain of a head and as a result, v cannot attract the subject to its Spec position. Takita (2010), on the other hand, appeals to Abels' (2003) anti-locality, which excludes movement that merges the moved item to the same head for the second time. In (i), the subject is merged with (a projection of) v at the initial site and the movement merges it again with (a projection of) the same v .

- (28) a. *[[_{CP} Hanako-ga t_i iru to]_j [_{Sooru-ni}_i [_{TP} Taroo-ga t_j omotteiru]]] (koto)
 Hanako-NOM is C Seoul-in Taroo-NOM think fact
 ‘[That Hanako is t_i]_j, in Seoul_i, [Taroo thinks t_j]
 (= ‘Taroo thinks that Hanako is in Seoul’)
- b. *[[_{TP} [_{PRO} t_i iku koto]-ga]_j Sooru-made_i Taroo-ni t_j meizirareta]
 go N-NOM Seoul-to Taroo-DAT ordered-was
 ‘[To go t_i]_j, to Seoul_i, was ordered Taroo t_j’
 (= ‘It was ordered Taroo to go to Seoul’)

The initial spell-out domain in (28a) may be the *vP* in the preposed CP or the preposed CP itself. Whichever it is, the order *Sooru-ni* < *iru* is established at that point. The CP, for example, is as in (29) at the point of spell-out.

- (29) [_{CP} Sooru-ni_i [_{TP} Hanako-ga_j [_{vP} [_{VP} t_i t_j iru]]] to]

The surface order is in contradiction with this order, and hence the example is predicted to be ungrammatical. The ungrammaticality of (28b) follows in the same way. The order *Sooru-made* < *iku* is established within the control complement, and the surface order contradicts this.

Takita (2010) demonstrates that the theory of linearization developed by Ko (2007) accounts for a number of other restrictions on Japanese scrambling as well. But even when we restrict our attention to the “proper binding” phenomenon, the analysis outlined above seems to be the only viable option at this point. As the analysis appeals to linearization to account for (28a, b), it denies that there is a syntactic constraint against unbound traces or remnant movement. In the following section, I present a piece of supporting empirical evidence for this approach.

3. Evidence for Takita’s PF Approach and the Generality of Remnant Movement

While the proper binding analysis attributes the ungrammaticality of (28a, b) to unbound traces, Takita’s (2010) PF approach implies that it is due to a failure of linearization between the moved constituent and its predicate. These two analyses could make different predictions with empty operator movement. Constraints on traces should apply in the same way whether the trace is produced by movement of an overt constituent or by movement of an empty operator. On the other hand, as Takita points out, an empty operator may be exempted from linearization requirements as it lacks phonetic content. In this section, I discuss two cases of empty operator movement, clefts and comparatives, and show that only the PF

approach can successfully accommodate the relevant facts.

The empty operator movement analysis of Japanese clefts was first proposed by Hoji (1990). The contrast in (30) shows that Subjacency effects are observed with this construction.

- (30) a. $[_{CP} [_{TP} \text{Taroo-ga} [_{CP} \text{doroboo-ga } e_i \text{ genkin-o } \text{nusunda to}] \text{ itta}] \text{ no}]-\text{wa}$
 Taroo-NOM thief-NOM cash-ACC stole C said C-TOP
sono ginkoo-kara_i da
 that bank-from Cop.
 ‘It is from that bank that Taroo said that a thief stole cash’
- b. * $[_{CP} [_{TP} [_{DP} [_{TP} e_i \text{ genkin-o } \text{nusunda}] \text{ doroboo}]-\text{ga } \text{kinoo } \text{taihosareta}]$
 cash-ACC stole thief-NOM yesterday arrested-was
no]-wa sono ginkoo-kara_i da
 C-TOP that bank-from Cop.
 ‘*Lit.* It is from that bank that the thief stole cash was arrested yesterday’

The gap is contained within a complex NP in (30b), and the ungrammaticality of the example already suggests that it is derived by movement. Hoji (1990) points out a further contrast between (30b) and (31).

- (31) $[_{CP} [_{TP} [_{DP} [_{TP} e_i \text{ genkin-o } \text{nusunda}] \text{ doroboo}]-\text{ga } \text{kinoo } \text{taihosareta}]$
 cash-ACC stole thief-NOM yesterday arrested-was
no]-wa sono ginkoo_i da
 C-TOP that bank Cop.
 ‘*Lit.* It is that bank that the thief stole cash (from) was arrested yesterday’

The focus is a PP in (30b) whereas it is a DP in (31). Hoji then proposes that the two examples have the structures in (32a, b) respectively.

- (32) a. $[_{CP} \text{Op}_i [_{TP} \dots t_i \dots] \text{C}]-\text{wa } \text{PP}_i-\text{da}$
 b. $[_{CP} [_{TP} \dots \text{pro}_i \dots] \text{C}]-\text{wa } \text{DP}_i-\text{da}$

That is, a cleft sentence is derived by empty operator movement when the focus is a PP, and it

can involve binding of *pro* when the focus is a DP.⁶

The analysis is confirmed by another contrast shown in (33).

- (33) *[CP [TP [DP [TP Soko-kara genkin-o nusunda] doroboo]-ga kinoo taihosareta]*
 there-from cash-ACC stole thief-NOM yesterday arrested-was
no]-wa sono ginkoo(-kara) da*
 C-TOP that bank -from Cop.
 ‘*Lit.* It is that bank that the thief stole cash from there was arrested yesterday’

This example shows that an overt resumptive pronoun is allowed only with a DP focus. The *pro* in (32b) is then nothing but a covert counterpart of the pronoun in (33). Also, as a pronoun is disallowed in PP clefts, the gap in (32a) cannot be *pro* but must be produced by movement.

Another Japanese construction that involves empty operator movement is comparatives, as demonstrated by Kikuchi (1987). This construction too exhibits clear Subjacency effects, as shown in (34).

- (34) a. *Taroo-wa [TP minna-ga [CP Hanako-ga e_i yonda to] omotteiru] yorimo*
 Taroo-TOP all-NOM Hanako-NOM read C think than
ooku-no honi-o yonda
 many-GEN book-ACC read
 ‘Taroo read more books than everyone thinks that Hanako read’

⁶ More precisely, a bare DP. Hoji (1990) shows that Case-marked DPs pattern with PPs. The analysis in (32b) is refined by Murasugi (1991). She argues that the *no* in this case is not a C but a pronoun that occurs in examples like (i).

- (i) *akai no*
 red one
 ‘a red one’

Then, the example is an equative sentence of the form ‘DP = DP’. According to this analysis, the first DP contains a relative clause headed by *no* ‘one’. It is known since Perlmutter (1972) that Japanese relative clauses can have *pro* as the gap and hence, do not exhibit Subjacency effects. This structure is excluded when the focus is a PP or a Case-marked DP because an equative sentence of the form ‘DP = PP’ or ‘DP = DP-Case’ does not make sense. The structure must then be as in (32a) in these cases.

- b. **Taroo-wa* [_{TP} *Hanako-ga* [_{DP} [_{TP} *e_i yonda*] *hito*]-*o* *sitteiru*] *yorimo*
 Taroo-TOP Hanako-NOM read person-ACC know than
ooku-no hon_i-o yonda
 many-GEN book-ACC read
 ‘*Lit.* Taroo read more books than Hanako knows a person who read’

The gap is contained within a complex NP in (34b), and the example is totally ungrammatical. (35) demonstrates that comparatives do not allow resumptive pronouns, just like PP clefts.

- (35) **Taroo-wa* [_{TP} *Hanako-ga* [_{DP} [_{TP} *sore-o yonda*] *hito*]-*o* *sitteiru*] *yorimo*
 Taroo-TOP Hanako-NOM it-ACC read person-ACC know than
ooku-no hon-o yonda
 many-GEN book-ACC read
 ‘*Lit.* Taroo read more books than Hanako knows a person who read them’

Kikuchi (1987) proposes that the complement of *yorimo* ‘than’ is a CP with an empty operator in its Spec. This is illustrated in (36).

- (36) [_{CP} Op_i [_{TP} ... *t_i* ...]] *yorimo*

Given that PP clefts and comparatives are derived by empty operator movement, I next examine examples with the following configurations:

- (37) a. [_{TP} ... [_{CP2} Op_i [_{TP2} ... [_{CP1} *t_i*’ [_{TP1} ... *t_i* ...]]]]]
 b. [_{CP1} *t_i*’ [_{TP1} ... *t_i* ...]]_j [_{TP} ... [_{CP2} Op_i [_{TP2} ... *t_j* ...]]]

In (37a), an empty operator is moved out of CP1 to the Spec, CP2 position. Then, in (37b), the lower CP1 is scrambled out of the higher CP2 so that the trace of the empty operator becomes unbound. If an unbound trace that results from two applications of scrambling, as in (15), repeated below as (38), is ruled out by the proper binding condition, examples of the form in (37b), which involve operator movement and scrambling, are expected to be illicit as well.

- (38) *[[_{CP} *Hanako-ga t_i iru to*]_j [_{Sooru-ni} [_{TP} *Taroo-ga t_j omotteiru*]]] (*koto*)
 Hanako-NOM be C Seoul-in Taroo-NOM think fact
 ‘[That Hanako is *t_i*]_j, in Seoul_i, [Taroo thinks *t_j*]_j’
 (= ‘Taroo thinks that Hanako is in Seoul’)

- (40) a. *Taroo-wa* [_{CP} *Op_i* [_{TP} *minna-ga* [_{CP} *Hanako-ga t_i yonda to*] *omotteiru*]]
 Taroo-TOP all-NOM Hanako-NOM read C think
yorimo ooku-no hon-o yonda (= (34a))
 than many-GEN book-ACC read
 ‘Taroo read more books than everyone thinks that Hanako read’
- b. ? [_{CP} *Hanako-ga t_i yonda to*] [_{TP} *Taroo-wa* [_{CP} *Op_i* [_{TP} *minna-ga t_j*
 Hanako-NOM read C Taroo-TOP all-NOM
omotteiru]] *yorimo ooku-no hon-o yonda*]
 think than many-GEN book-ACC read
 ‘[_{CP} That Hanako read *t_i*]_j, Taroo read more books than everyone thinks *t_j*’

A CP remnant of operator movement is scrambled to the sentence-initial position in (40b). It is clearly in violation of the proper binding condition however the condition is formulated. On the other hand, it does not involve contradiction in linearization as long as the empty operator does not participate in the process. Once the empty operator is ignored, the example can be linearized in the same way as more straightforward examples with long-distance scrambling of CP.

It was argued above that (39b) and (40b) constitute evidence for Takita’s (2010) PF approach to (38) over the proper binding analysis of Saito (1985). They are consistent with Müller’s (1996) generalization and Kitahara’s (1997) explanation for it because the remnant CP is created and preposed by two distinct operations, operator movement and scrambling. However, as noted in the preceding section, (19), repeated below as (41), does not fall under Müller’s generalization.

- (41) * [_{TP} [_{PRO} *t_i iku koto*]-*ga_j* *Sooru-made_i* *Taroo-ni t_j meizirareta*]
 go N-NOM Seoul-to Taroo-DAT ordered-was
 ‘[To go *t_i*]_j, to Seoul_i, was ordered Taroo *t_j*’
 (= ‘It was ordered Taroo to go to Seoul’)

The example is produced by scrambling and passive. Hence, Takita’s (2010) analysis in terms of linearization is the only one that can successfully accommodate all the examples in (38)-(41). And the analysis implies that there is no syntactic constraint that prohibits movement of a remnant created by scrambling.

The examples (39b) and (40b), at the same time, provide additional evidence for the radical reconstruction property of Japanese scrambling. The empty operators in these examples clearly must bind their traces at LF for proper interpretation. This is possible only if the scrambled CP is placed back to a position within the domain of the empty operator. In the following section, I discuss implications of radical reconstruction for the formulation of the

Binding conditions and the interpretation of movement chains.

4. Radical Reconstruction and Binding

Sufficient evidence, I believe, was presented for the radical reconstruction property of Japanese scrambling in the preceding sections. Given this, it is somewhat curious that scrambling extends the binding possibility for anaphors as in (42), cited from DeJima (1999).

- (42) a. *Taroo-ga_i [_{CP} Hanako-ga_j [_{CP} Ziroo-ga_k zibunzisin-o_{i*,j*,k} hihansita to]*
 Taroo-NOM Hanako-NOM Ziroo-NOM self-ACC criticized C
itta to] omotteiru (koto)
 said C think fact
 ‘Taroo_i thinks [that Hanako_j said [that Ziroo_k criticized self_{i*,j*,k}]]’
- b. *Taroo-ga_i [_{CP} Hanako-ga_j [_{CP} zibunzisin-o_{i*,j,k} Ziroo-ga_k t hihansita to]*
 Taroo-NOM Hanako-NOM self-ACC Ziroo-NOM criticized C
itta to] omotteiru (koto)
 said C think fact
 ‘Taroo_i thinks [that Hanako_j said [that self_{i*,j,k}, Ziroo_k criticized t]]’
- c. *Taroo-ga_i [_{CP} zibunzisin-o_{i,j,k} Hanako-ga_j [_{CP} Ziroo-ga_k t hihansita to]*
 Taroo-NOM self-ACC Hanako-NOM Ziroo-NOM criticized C
itta to] omotteiru (koto)
 said C think fact
 ‘Taroo_i thinks [that self_{i,j,k}, Hanako_j said [that Ziroo_k criticized t]]’

Nakamura (1996) argues that *zibun-zisin* ‘self-self’, as opposed to the long-distance reflexive *zibun* ‘self’, is a (subject-oriented) anaphor that requires a local antecedent. The claim is controversial, but it is clear that only the local subject qualifies as its antecedent in standard examples like (42a). But when it is scrambled to the initial position of the most deeply embedded CP as in (42b), the middle subject also becomes a possible antecedent. And further scrambling to the initial position of the middle CP makes the antecedent of *zibun-zisin* three-ways ambiguous, including the matrix subject.

If scrambled phrases are reconstructed at LF and the binding conditions apply at this level, the differences among (42a, b, c) are surprising. The straightforward prediction is that all three examples are interpreted as (42a) because this is roughly the LF for those examples. (42b, c) clearly show that scrambling has effects on interpretation. Given these examples and (43), among others, I argued in Saito (2003) that Condition (A) is an anywhere condition, as proposed by Belletti and Rizzi (1988).

- (43) *Zibunzisin-o_i Taroo-ga_i t_i semeta (koto)*
 self-ACC Taroo-NOM blamed fact
 ‘Himself_i, Taroo_i blamed t_i’

The idea was that Condition (A) can be satisfied as the sentence is constructed and the scrambled phrase is preposed. But the conception of Condition (A) as an anywhere condition makes little sense once we accept the reformulation of the binding conditions as interpretive procedures as proposed in Chomsky (1993) and Chomsky and Lasnik (1993). Their formulation of Conditions (A), (B), (C) is shown in (44).

- (44) a. If α is an anaphor, interpret it as coreferential with a c-commanding phrase in D.
 b. If α is a pronominal, interpret it as disjoint from every c-commanding phrase in D.
 c. If α is an r-expression, interpret it as disjoint from every c-commanding phrase.

In this section, I suggest an analysis of the scrambling examples in (42) that is in line with (44). I first discuss Chomsky’s (1993) analysis of reconstruction based on the copy and deletion analysis of movement. Then, I present an analysis for (42), adapting this and Quicoli’s (2008) phase-based application of the binding procedures.⁸

Chomsky (1993) attempts to show that binding conditions apply at LF. In that process, he adopts the copy and deletion analysis of wh-movement, illustrated in (46) for (45a).⁹

- (45) a. *Which picture of John did Mary buy*
 b. Which_x Mary bought [x picture of John]
- (46) a. [Which picture of John] Mary bought [which picture of John]
 b. [Which [*t* picture of John]] Mary bought [which [*t* picture of John]]
 c. [Which [~~*t* picture of John~~]] Mary bought [~~which~~ [*t* picture of John]]

(45a) is interpreted as in (45b). Wh-movement copies the wh-phrase as in (46a) as the first

⁸ Reformulations of Binding theory in terms of phase are proposed in Lee-Schoenfeld (2008) and Charnavel and Sportiche (2013) as well. The analysis to be proposed in this paper is incompatible in some respects with the latter, which has many attractive consequences. I leave it for future research to examine whether these incompatibilities are only superficial or more fundamental in nature.

⁹ I ignore the intermediate landing site at the edge of vP for the ease of exposition when it does not play a role in the analysis.

step toward this interpretation. Then, in each copy, covert raising applies in order to separate *which*, which serves as a wh-operator, and [*t picture of John*], which is to be interpreted as the object argument of the verb *buy*.¹⁰ Finally, the argument part is deleted at CP Spec and the operator part is deleted at the object position as in (46c). He argues that this mechanism accounts for the well-known reconstruction phenomenon, illustrated by (47a, b).

- (47) a. *Which picture of himself did John buy*
 b. **Which picture of John_i did he_i buy*

These examples have the LFs in (48).

- (48) a. [~~Which [*t picture of himself*]] John bought [~~which [*t picture of himself*]]]
 b. [~~Which [*t picture of John_i]]] he_i bought [~~which [*t picture of John_i]]]*~~*~~~~~~

Consequently, (47a) satisfies Condition (A) and (47b) is in violation of Condition (C) at LF.

Chomsky (1993) extends this analysis to examples like (49a), where wh-movement creates a new binding possibility.

- (49) a. *Which picture of himself does John think that Mary bought*
 b. [~~Which [*t picture of himself*]] John thinks [_{CP} [~~which [*t picture of himself*]]] that Mary bought [~~which [*t picture of himself*]]]~~~~~~

The straightforward application of the copy and deletion analysis yields (49b), which incorrectly predicts the example to be ungrammatical. Chomsky then adopts the anaphor movement analysis illustrated in (50).

- (50) a. [~~Which picture of himself] John thinks [_{CP} [~~which picture of himself] that Mary bought [~~which picture of himself]~~]]
 b. [~~Which picture of himself] John-himself_i thinks [_{CP} [~~which picture of himself_i] that Mary bought [~~which picture of himself]~~]]~~~~~~~~

¹⁰ This covert movement itself should be analyzed in terms of copy and deletion. A wh-element contains two parts, one to be interpreted as a wh-operator and the other as a variable. Hence it occupies two positions by wh-movement. The wh-operator part is interpreted at Spec, CP and the variable part at the initial site. Then, the movement in (46b) can be construed as copying, followed by the deletion of the variable part at the landing site and the wh-operator part at the initial site. I continue to indicate a copy of a wh-element that is to be interpreted as a variable by *t*, when there is no room for confusion.

- c. [~~Which~~ [~~*t*~~ picture of himself]] John-himself_i thinks [_{CP} [~~which~~ [*t* picture of himself_i]]] that Mary bought [~~which~~ [*t* picture of himself]]]
- d. [~~Which~~ [~~*t*~~ picture of himself]] John-himself_i thinks [_{CP} [~~which~~ [*t* picture of himself_i]]]; that Mary bought *t*_j]

Wh-movement takes place successive-cyclically. Then, the wh-movement in (49a) creates (50a) with copying. When *himself* takes the DP *John* as its antecedent, its instance that is in local relation with *John* adjoins to the DP as in (50b). The copy of a wh-phrase in an intermediate Spec, CP is normally deleted as it has no contribution to interpretation. But the deletion is impossible in the case of (50b) because it would make the instance of *himself_i* adjoined to *John* a member of a singleton chain without a theta-position. Consequently, the intermediate copy is retained as in (50c) and then (50d), and the anaphor receives proper interpretation. Based on this analysis, Chomsky proposes that the deletion of intermediate copies and the pied-piped material in an operator position must apply as long as it does not create illicit chains. This guarantees that *John* in (47b) is deleted at Spec, CP and retained within the object so that the example is ruled out by Condition (C).

This analysis, interestingly, does not straightforwardly extend to the similar examples with scrambling in (42). The simpler example in (51) suffices to illustrate this point.

- (51) *Taroo-ga_i [_{CP} zibunzisin-o_{i,j} Hanako-ga_j t hihansita to] itta (koto)*
 Taroo-NOM self-ACC Hanako-NOM criticized C said fact
 ‘Taroo_i thinks [that self_{i,j} Hanako_j criticized *t*]

Suppose that *zibunzisin* ‘self’ is at the edge of the embedded CP just like the intermediate wh-phrase in (50a). If it adjoins to the antecedent *Taroo*, the following structure is derived:

- (52) Taroo-zibunzisin_i [_{CP} zibunzisin_i [_{TP} Hanako-ga zibunzisin-o hihansita] to] itta

Here, the two instances of *zibunzisin_i* form an A-chain. But this chain does not contain a theta-position. The deletion of the instance in Spec, CP does not help. Further, if *zibunzisin* in the embedded object position is included in the chain so that there is a theta-position, the chain will be an improper chain of the form A-A’-A. Hence, it is unclear how (51) can be analyzed with anaphor movement.

A more clearly problematic example can be constructed with a quantified DP. Japanese exhibits scope rigidity as in (53).

- (53) *Dareka-ga [ni-satu-no hon]-o karidasita*
 someone-NOM two-volume-GEN book-ACC checked-out
 ‘Someone checked out two books’ (some > two)

At the same time, it is known since Kuroda (1971) that scrambling yields scope ambiguity. This is shown in (54).

- (54) a. *[Ni-satu-no hon]-o_i dareka-ga t_i karidasita*
 two-volume-GEN book-ACC someone-NOM checked-out
 ‘Two books, someone checked out *t*’ (some > two, two > some)
- b. *Nanika-o_i [hutari-no hito]-ga t_i katta*
 something-ACC two-person-GEN person-NOM bought
 ‘Something, two people bought *t*’ (two > some, some > two)

However, Oka (1990) points out that this effect is confined to clause-internal scrambling. In (55b), for example, *ni-satu-no hon* ‘two books’ cannot take wide scope over *dareka* ‘someone’ though it is scrambled to the matrix-initial position out of the embedded CP.

- (55) a. *Dareka-ga [_{CP} Hanako-ga [ni-satu-no hon]-o karidasita to]*
 someone-NOM Hanako-NOM two-volume-GEN book-ACC checked-out C
itta
 said
 ‘Someone said [that Hanako checked out two books]’ (some > two)
- b. *[Ni-satu-no hon]-o_i dareka-ga [_{CP} Hanako-ga t_i karidasita*
 two-volume-GEN book-ACC someone-NOM Hanako-NOM checked-out
to] itta
 C said
 ‘Two books_{*i*}, someone said [that Hanako checked out *t_i*]’ (some > two)

This indicates that *ni-satu-no hon* ‘two books’ in (55b) takes embedded scope even though it is scrambled into the matrix clause.

Given this background, let us now consider the crucial example in (56).

- (56) *Taroo-ga_i [CP [zibunzisin-no_i ni-satu-no hon-o]_j dareka-ga*
 Taroo-NOM self-GEN two-volume-GEN book-ACC someone-NOM
[CP Hanako-ga t_j karidasita to] itta to] omotteiru (koto)
 Hanako-NOM checked.out C said C think fact
 ‘Taroo_i thinks [that [self^o_{s_i} two books]_j, someone said [that Hanako checked out t_j]]’
 (some > two)

The configuration of the example is shown in (57).

- (57) Taroo_i said [CP [self^o_{s_i} two books]_j that [TP someone thinks [CP that Hanako checked out t_j]]]

Zibunzisin-no ni-satu-no hon ‘self’s two books’ is scrambled so that *Taroo* qualifies as the antecedent of *zibunzisin*. At the same time, *nisatu-no hon* ‘two books’ takes embedded scope, and hence narrow scope with respect to *dareka* ‘someone’, just as in (55b). This state of affairs is not predicted by Chomsky’s (1993) analysis because the scope of ‘self’s two books’ implies that it is deleted at the landing site as in (58).

- (58) Taroo_i-self_i said [CP [~~self^o_{s_i} two books~~] that [TP ... [self^o_{s_i} two books] ...

This deletion should result in a failure for ‘self_i’ to be assigned a theta-role. Then, an alternative analysis should be pursued for examples like (51) and (56).

An analysis of (49a), repeated below as (59), that is in line with Chomsky’s more recent works (2000, 2008) is proposed by Quicoli (2008).

- (59) *Which picture of himself does John think that Mary bought*

He proposes that the Binding theory applies cyclically at each phase. In the remainder of this section, I first outline his theory and then show that it successfully accommodates the examples of scrambling discussed above.

Let us first consider the simple examples in (60).

- (60) a. *John_i recommended himself_i*
 b. **John_i recommended him_i*

The *vP* phases of these examples are as in (61a, b) respectively.

- (61) a. [_{vP} John_i [_{VP} recommend himself_i]]

- b. [_{vP} John_i [_{VP} recommend him_i]]

Both *himself* and *him* are bound internal to the phase. Hence, these examples can be accounted for if Condition (A) requires anaphors to be bound and Condition (B) prohibits pronouns from being bound within a phase. The analysis can be stated more precisely in terms of transfer operation to the C-I interface. When VP is transferred to the C-I interface upon the completion of the vP phase, an anaphor within the VP must be transferred with its reference specified and a pronoun within the VP is transferred with the information that it is disjoint from any c-commanding DP in the phase.^{11, 12}

Quicoli (2008) extends this analysis to (59). The embedded vP phase of the example looks like (62a).

- (62) a. [_{vP} [which picture of himself] [Mary [_{VP} buy [which picture of himself]]]]
 b. [_{vP} [which picture of himself] [John_i [_{VP} think [_{CP} [which picture of himself]_i]
 [_{TP} ...

VP is transferred at this point.¹³ But if the relevant requirement on *himself* is that its reference

¹¹ I followed Ko (2007) and Takita (2010) above and assumed that when a vP phase is completed, all elements within the vP is linearized. On the other hand, I assume here as in Chomsky (2000, 2008) that only the complement VP is transferred to the C-I interface. This discrepancy makes sense because fixation of the relative order among the elements in vP has no grave consequences whereas phrases at the edge of vP can move on and receive interpretation at a position in a higher transfer domain.

¹² Here, I do not discuss Condition (C) in any detail. But I suspect that it can most plausibly formulated as in (i), departing from Quicoli (2008).

- (i) Condition (C): Interpret a DP α as disjoint from an R-expression β if α c-commands every instance of β in the amalgamated transfer domain of α .
 (the amalgamated transfer domain of α = the amalgamation of all transfer domains up to the one that includes α .)

This formulation successfully distinguishes between (ii) and (iii). (See Lebeaux 1988 and Chomsky 1993 for discussion of these examples.)

- (ii) * Which picture of John_i did [_{TP} he_i like (which picture of John_i)]
 (iii) [_{TP} The picture of John_i seemed to him_i [_{TP} (the picture of John_i) to be attractive]]

The amalgamated transfer domain that includes *he* in (ii) is the TP. As *he* c-commands every instance of *John* in this domain, it is disjoint from *John*. On the other hand, the relevant transfer domain is the matrix TP in (iii). *Him* does not c-command every instance of *John* in this domain and hence, there is no Condition (C) effect in the example.

¹³ In (62a) and subsequent examples, the shaded part indicates the domain that is transferred to the C-I interface.

must be determined by the end of the derivation, it can be left pending because its copy appears in a higher transfer domain. At the matrix vP phase, *himself* within the embedded Spec, CP is bound by *John*. Thus, the information on the reference of *himself* can be sent to the C-I interface as the matrix VP is transferred.

Before applying this analysis to the scrambling examples, let us make it a little more precise by adding Chomsky's (1993) theory of chain interpretation to it. I assume, following Chomsky (1993) that *which* in *which picture of himself* is raised covertly as in (63) so that the operator *which* is separated from [*t picture of himself*], which serves as an argument.

(63) [which [*t picture of himself*]]

Then, the configuration in (64a) obtains when the wh-phrase moves to the edge of the embedded vP .¹⁴

(64) a. [_{vP} [which [*t picture of himself*]] [Mary [_{VP} buy [which [*t picture of himself*]]]]]
 b. [_{vP} [which [*t picture of himself*]] [Mary [_{VP} buy [~~which~~ [*t picture of himself*]]]]]

At this point, the VP is transferred to the C-I interface with the reference of *himself* pending, as Quicoli (2008) proposes. But one more thing needs to be said to make this transfer successful as illustrated in (64b). That is, it is necessary to make sure that [*t picture of himself*] is interpreted as the object whereas *which* receives no interpretation in the VP. I simply state this as the interpretive procedure in (65).

(65) a. An argument is interpreted only in a θ -position.
 b. An operator is interpreted only in a criterial operator position.

Given this, *which* receives no interpretation in the VP in (64) because it is not in a criterial position for a wh-operator in the sense of Rizzi (2010). On the other hand, [*t picture of himself*] is interpreted as the object of the verb *buy*.

The wh-phrase *which picture of himself* moves on to the edge of the embedded CP as in (66).

(66) [_{CP} [which [*t picture of himself*]] [_{TP} Mary [_{vP} [~~which~~ [*t picture of himself*]]] [Mary [_v v
 [_{VP} ...

¹⁴ Here, I assume the single cycle model of Bobaljik (1995), where covert movement applies concurrently with overt movement as structures are constructed. Thus, the covert raising of *which* applies prior to the overt movement of the wh-phrase to the edge of vP in (64).

The embedded TP is transferred to the C-I interface at this point. The wh-phrase at the edge of vP receives no interpretation because *which* is not in a wh-operator position and [*t picture of himself*] is not in a θ -position. (67) obtains after the wh-phrase moves to the edge of the matrix vP.

(67) [_{vP} [which [*t picture of himself*]]] [John_i [_{VP} think [_{CP} [which [*t picture of himself*]]]
[_{TP} ...

As the VP is transferred to the C-I interface, *himself* picks up its reference from *John* as Quicoli (2008) proposes. At the same time, neither *which* nor [*t picture of himself*] receives an interpretation at the edge of the embedded CP because of (65). Finally, the wh-phrase moves to the edge of the matrix CP as in (68).

(68) [_{CP} [which [*t picture of himself*]]] [_{TP} John [_{vP} [which [*t picture of himself*]]] [John [_{v'} v
[_{VP} ...

The wh-phrase at the edge of vP receives no interpretation for reasons that should be clear by now. At the edge of the matrix CP, [*t picture of himself*] again receives no interpretation because it is not in a θ -position, but *which* is interpreted as a wh-operator according to (65b). It is in a criterial position for an interrogative operator. Thus, an operator-variable chain is successfully formed as illustrated in (69).

(69) [_{CP} [which [*t picture of himself*]]] [_{TP} ... [_{CP} ... [_{TP} ... [_{VP} buy [which [*t picture of
himself*]]]]]]]]

The analysis for (59) just illustrated is basically Quicoli's (2008). But the added (65) makes it possible to account for the scrambling example (51), repeated below as (70), in a way that is consistent with the radical reconstruction property of scrambling.

(70) *Taroo-ga_i [_{CP} zibunzisin-o_{i,j} Hanako-ga_j t hihansita to] itta (koto)*
Taroo-NOM self-ACC Hanako-NOM criticized C said fact
'Taroo_i thinks [that self_{i,j} Hanako_j criticized *t*']

The embedded vP is formed as in (71).

(71) [_{vP} zibunzisin-o [*Hanako-ga* [_{v'} [_{VP} zibunzisin-o hihansita] v]]]

The VP is transferred to the C-I interface at this point. *Zibunzisin* ‘self’ receives interpretation as the object of *hihansita* ‘criticized’ because it is an argument in a θ -position. It can pick up reference from *Hanako* at the same time, but can also leave the reference pending because a copy appears in a higher transfer domain. Next, *zibunzisin* moves to the edge of the embedded CP as in (72a) and then the matrix vP is formed as in (72b).

- (72) a. $[_{CP} zibunzisin-o [_{TP} Hanako-ga [_{VP} zibunzisin [Hanako-ga [_{v'} [_{VP} \dots] v] \dots] \dots]$
 b. $[_{VP} Taroo-ga [_{v'} [_{VP} [_{CP} zibunzisin-o [_{TP} \dots]]] itta] v]]$

Zibunzisin at the edge of vP in (72a) receives no interpretation when the shaded TP is transferred to the C-I interface, as it is neither in a θ -position nor in a criterial operator position. It does not receive an interpretation when the VP in (72b) is transferred, for the same reason. But it can pick up its reference from *Taroo* as part of the transfer. Thus, the ambiguity of *zibunzisin* in (70) follows.

The analysis of (70) outlined above is consistent with the radical reconstruction property of scrambling because *zibunzisin* can pick up its reference from *Taroo* and yet it is interpreted only at the initial site. Before concluding this section, I apply the mechanism to (13b), the original example that motivated radical reconstruction, to confirm this. (13b) is repeated below as (73).

- (73) $[Dono\ hon-o_i\ [_{TP}\ Taroo-ga\ [_{CP}\ [_{TP}\ Hanako-ga\ t_i\ yonda]\ ka]\ siritagatteiru]]\ (koto)$
 whichbook-ACC Taroo-NOM Hanako-NOM read Q
 want to know fact
 ‘[Which book_i, Taroo wants to know [Q [Hanako read t_i]]]’
 (= ‘Taroo wants to know which book Hanako read’)

The derivation is illustrated phase by phase in (74).

- (74) a. $[_{VP} [dono [t\ hon]]-o [Hanako-ga [_{v'} [_{VP} [~~dono~~ [t\ hon]]-o yonda] v]]]$
 b. $[_{CP} [dono [t\ hon]]-o [C' [_{TP} Hanako-ga [_{VP} [~~dono~~ [t\ hon]]-\theta [Hanako-ga [_{v'} [_{VP} \dots] v]]]] ka]]]$
 c. $[_{VP} [dono [t\ hon]]-o [Taroo-ga [_{v'} [_{VP} [_{CP} [dono [t\ hon]]-\theta [C' [_{TP} \dots] ka] siritagatteiru] v]]]]]$
 d. $[_{CP} [~~dono~~ [t\ hon]]-\theta [_{TP} Taroo-ga [_{VP} [~~dono~~ [t\ hon]]-\theta [Taroo-ga [_{v'} [_{VP} \dots] v]]]]]]]$

In (74a), *dono hon-o* ‘which book-ACC’ moves to the edge of the embedded vP. Only the argument part, $[t\ hon-o]$, is interpreted as the object of the verb *yonda* ‘read’. In (74b), the

wh-phrase moves to the edge of the embedded CP. The copy receives no interpretation at the edge of the embedded vP as it is neither a θ -position nor a criterial operator position. The wh-phrase moves on to the edge of the matrix vP in (74c). At this point, *dono* ‘which’ is interpreted as a wh-operator at the edge of the embedded CP as it is in a criterial interrogative operator position.¹⁵ Finally, the wh-phrase reaches the final landing site, the edge of the matrix CP, in (74d). Neither the operator part *dono* nor the argument part [*t hon-o*] receives interpretation at the edges of the matrix CP and vP because these positions are not θ -positions or criterial interrogative operator positions. Thus, the scrambling from the edge of the embedded CP to the matrix initial position is semantically vacuous.

In this section, it was shown that Quicoli’s (2008) phase based binding theory, augmented by a mechanism of chain interpretation, successfully accounts for the fact that scrambling extends the binding possibility of local reflexives in a way that is consistent with its radical reconstruction property. In the following section, I suggest that the same mechanism provides an account for an outstanding problem with the scope of pied-piped wh-phrases in English.

5. The Anti-Reconstruction Phenomenon of Pied-Pied Wh-Phrases

In Sections 1 and 2, I touched on the apparent proper binding effects observed with English wh-movement. The relevant examples, (6) and (12b), are repeated below as (75a, b) respectively.

- (75) a. * [*Which picture of t_i*]_j does John wonder *who_i* Mary liked *t_j*
 b. ?? [*Which picture of whom*]_i does John wonder *who_j* *t_j* bought *t_i*

Although *who* fails to bind its trace in (75a), the example is interpreted as in (76) with reconstruction.

- (76) Which_j John wonders *who_i* Mary liked [*t_j picture of t_i*]

As the operator-variable relations in (76) are legitimate, it is not obvious why (75a) should be totally ungrammatical. (75b) is a covert counterpart of (75a). The example is a Subjacency

¹⁵ This assumes, following Huang (1982), Lasnik and Saito (1984), Richards (2001), among others, that Japanese wh’s are interrogative operators. The analysis is in accord with the claim of Kuroda (1988) and Takahashi (1994) that scrambling of a wh-phrase to its scope position counts as wh-movement.

violation but it still allows the interpretation with *whom* taking matrix scope. What it resists is the reading in which *whom* takes embedded scope. This fact, too, is puzzling because *picture of whom* should reconstruct as in (77).

(77) Which_i John wonders who_j t_j bought [t_i picture of whom]

Both (75a) and (75b) appear to be illicit examples of remnant movement. A remnant [*which picture of t*] moves in (75a), and *which picture of whom* in (75b) is also a remnant of covert movement, if *whom* moves covertly to the edge of the embedded CP when it takes scope at that position. Thus, the examples pose a potential problem for the hypothesis that there are no constraints that specifically ban unbound traces or remnant movement. In this section, I suggest a solution to this problem. I argue that the ungrammaticality of (75a) as well as the scope property of (75b) can be analyzed on the basis of the chain interpretation mechanism considered in the preceding section.¹⁶

Let us first take a closer look at the derivation of (75b). The embedded vP phase is formed as in (78).

(78) [_{vP} [whom_i [which_j [t_j picture of t_i]]] [who [_{vP} bought [whom_i [which_j [t_j picture of t_i]]]]]]]

Whom and *which* are raised covertly so that the wh-operators and [*t picture of t*], which is interpreted as the object, are separated in the wh-phrase. Then, the wh-phrase moves to the edge of the embedded vP. As the VP is transferred to the C-I interface, only the argument, [*t picture of t*], is interpreted in the object position. The wh-phrase then moves to the edge of the matrix vP and on to the edge of the matrix CP. This yields the configuration in (79).

(79) [_{CP} [whom_i [which_j [t_j picture of t_i]]] [_{TP} John [_{vP} [whom_i [which_j [t_j picture of t_i]]] [John [_{vP} ...

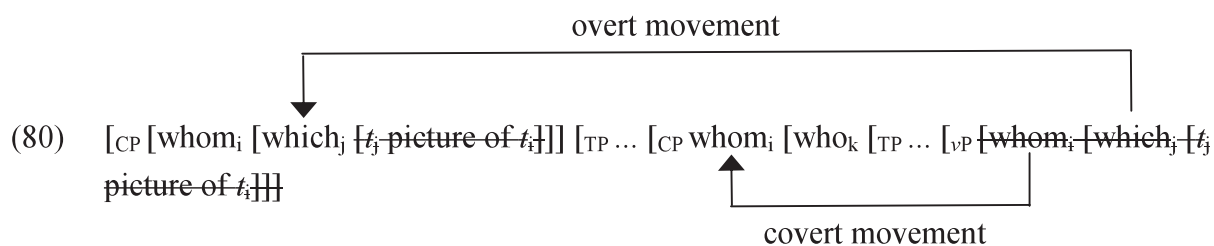
¹⁶ The ungrammaticality of (75a) may follow from the linearization mechanism discussed in Section 2 under the plausible assumption that DP is a spell-out domain. As *who* is extracted out of *which picture of who*, it first has to move to the edge of the DP as in (i).

(i) [_{DP} who_i [which [_{NP} picture of t_i]]]

If linearization applies at this point, the order ‘who < which’ is established. As (75a) contradicts this, the example is ruled out exactly as the apparent proper binding violations with scrambling. However, I do not pursue this analysis because it does not extend to (75b). In this example, *whom* remains in situ and the order ‘which < whom’ is preserved throughout the derivation.

Here, note the interpretation that the *wh*-phrase receives at the edge of the CP. Since it is a criterial interrogative operator position, both *whom* and *which* should be interpreted as *wh*-operators whereas the argument, $[t_j \text{ picture of } t_i]$, receives no interpretation. Thus, the chain interpretation mechanism entertained in the preceding section predicts correctly that *whom* takes matrix scope in (75b).

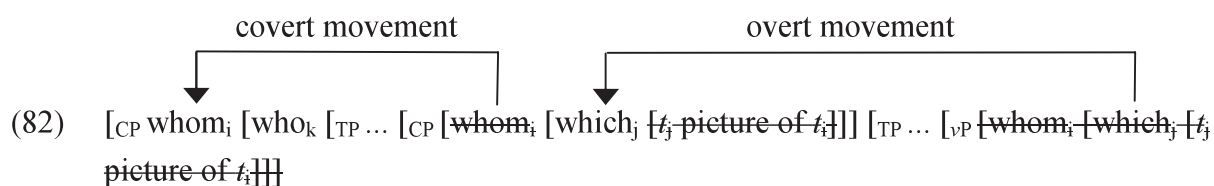
It should be noted that a slightly more complex analysis is required if covert movement is assumed for *wh*-phrases in situ. Under this assumption, the initial *whom* in (78) covertly moves to the edge of the embedded CP when it takes embedded scope. Then, the following configuration obtains:¹⁷



This configuration is straightforwardly ruled out because *whom* receives interpretation as a *wh*-operator in two distinct positions, the edges of the matrix and embedded CPs. But a complication arises when the example is compared with van Riemsdijk and William's (1981) (12a), repeated below as (81).

(81) *Who_i t_i wonders [which picture of whom]_j Mary bought t_j*

In this example, *whom* can take matrix scope as well as embedded scope. This indicates that the following configuration is legitimate:



That is, *whom* at the edge of the embedded CP can covertly move to the edge of the matrix CP and be interpreted only at the final landing site.

What distinguishes (80) and (82) is that the two instances of *whom* at the edges of the matrix and embedded CPs are parts of a single chain in the latter whereas they head their

¹⁷ More precisely, the *wh*-phrase moves overtly to the edge of the matrix CP through the edge of the matrix *vP*. I ignored the intermediate landing site in (80) because it is not important for the discussion.

respective chains in the former. Then, (83) enables us to allow (82) while maintaining the account for (80).

(83) An operator must be interpreted in a criterial operator position if it heads a chain.

In (80), the two instances of *whom* head chains, and hence must both be interpreted as wh-operators. On the other hand, only *whom* at the edge of the matrix CP heads a chain in (82). The one at the edge of the embedded CP, then, need not receive interpretation.

Although (83) is a stipulation, it seems to be in line with the phase theory. Let us consider the two configurations in (84), where the edge of CP is a criterial interrogative operator position.

- (84) a. $[_{VP} wh_i \dots [_{VP} \dots [_{CP} wh_i [_{TP} \dots$
 b. $[_{VP} \dots \dots [_{VP} \dots [_{CP} wh_i [_{TP} \dots$

In both cases, VP is transferred to the C-I interface. In the case of (84a), there is a copy of the wh in the higher transfer domain. Hence, the interpretation of the wh can wait and need not take place at the edge of the CP. On the other hand, there is no such option in the case of (84b). If the wh does not receive interpretation at the edge of the CP, it never will. Thus, it is plausible that (83) is part of the phase-based interpretive mechanism. The situation is in fact somewhat similar to that of anaphor interpretation discussed above.

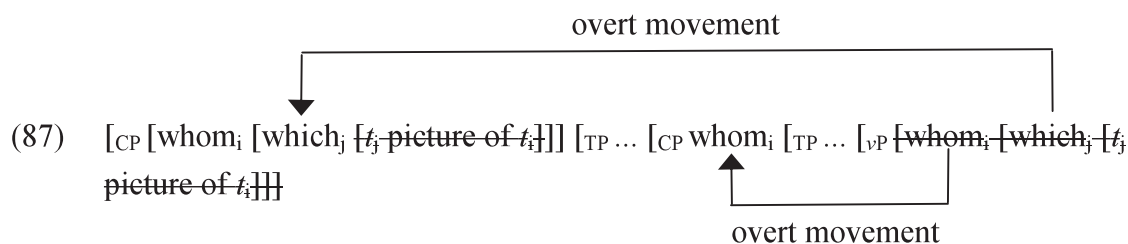
- (85) a. $[_{VP} \dots [\dots self \dots]_i \dots [_{VP} \dots [\dots self \dots]_i \dots$
 b. $[_{VP} \dots \dots \dots [_{VP} \dots [\dots self \dots]_i \dots$

In the case of (85a), the reference of the anaphor can be left pending when the VP is transferred to the C-I interface because there is a copy in the higher transfer domain. On the other hand, it must be determined in the case of (85b) as the anaphor will not be able to pick up its reference later in the derivation.

The analysis just outlined for (75b) also accounts for the ungrammaticality of (75a), repeated below as (86).

(86) **[Which picture of t_i] $_j$ does John wonder who $_i$ Mary liked t_j*

The example is derived as in (87).



The only notable difference between (80), the derivation of (75b) for *whom* taking embedded scope, and (86) is that the movement of *whom* to the edge of the embedded CP is covert in the former whereas it is overt in the latter. But this difference does not affect the interpretation of *whom*. Just as in (80), *whom* receives interpretation as an interrogative operator at the edges of both the matrix and embedded CPs in (87). The example is excluded because a *wh* cannot take scope at two distinct positions. Thus, the ungrammaticality of (86) and the scope property of *whom* in (75b) receive a uniform analysis.

6. Conclusion

As reviewed in Section 2, there are abundant cases of illicit remnant movement that preposes a remnant created by scrambling. In Section 3, I presented a new piece of evidence for their analysis by Takita (2010) in terms of linearization. One of the crucial examples, (40b), is repeated below as (88).

- (88) ?[_{CP} Hanako-ga t_i yonda to]_j [_{TP} Taroo-wa [_{CP} Op_i [_{TP} minna-ga t_j omotteiru]]]
 Hanako-NOM read C Taroo-TOP all-NOM think
 yorimo ooku-no hon-o yonda]
 than many-GEN book-ACC read
 ‘[_{CP} That Hanako read t_i]_j, Taroo read more books than everyone thinks t_j’

I argued that examples of this kind can be accommodated under Takita’s PF approach but not under the proper binding analysis. This supports his claim that there are no syntactic constraints, such as the proper binding condition, against remnant movement.

Examples like (88) provide additional evidence for the radical reconstruction property of Japanese scrambling. The preposed CP in (88) must reconstruct so that Op binds its trace. In Section 4, I presented an analysis for examples such as (51), repeated below as (89), where scrambling extends the binding possibility of a local reflexive.

- (89) *Taroo-ga_i [CP zibunzisin-o_{i,j} Hanako-ga_j t hihansita to] itta (koto)*
 Taroo-NOM self-ACC Hanako-NOM criticized C said fact
 ‘Taroo_i thinks [that self_{i,j} Hanako_j criticized *t*]

This is unexpected if *zibunzisin* ‘self’ reconstructs and the Binding theory applies at LF. I argued that Quicoli’s (2008) phase-based Binding theory, augmented by a chain interpretation mechanism, allows the explanation of (89) in a way that is consistent with the radical reconstruction property of scrambling.

Finally, in Section 5, I considered the scope property of *wh-in-situ* in examples such as (75b), repeated below as (90).

- (90) ??[Which picture of whom]_i does John wonder who_j t_j bought t_i

As discussed in detail, *whom* can only take matrix scope and cannot have embedded scope in this example. This may be regarded as a “proper binding effect” because if *whom* covertly moves to the edge of the embedded CP, it fails to bind its trace. But the analysis is untenable if *picture of whom* is reconstructed as widely assumed. It appears then that a stipulation must be made to ban the movement of a remnant created by covert *wh*-movement. I suggested that the phase-based interpretive mechanism of chains, proposed in Section 4, makes it possible to provide an alternative account for the example without making this stipulation.

As noted at the outset of this paper, the apparent proper binding effects and the radical reconstruction property have been considered major characteristics of Japanese scrambling and have been discussed extensively in the literature. If the proposals in this paper are on the right track, the former provides important data for the examination of linearization as Takita (2010) argues, and the latter can be employed to investigate the precise formulation of the Binding theory and the chain interpretation mechanism.

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