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

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Mamoru Saito

Nanzan University

Publications and Conference Presentations: 2012~2015

Publications in English

[1] Saito, Mamoru (2012) "Case Checking/Valuation in Japanese: Move, Agree or Merge," *Nanzan Linguistics* 8, 109-127.

[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.

[3] Saito, Mamoru (2012) "Sentence Types and the Japanese Right Periphery," in Günther Grewendorf and Thomas Ede Zimmermann, eds., *Discourse and Grammar: From Sentence Types to Lexical Categories*, Walter de Gruyter, Berlin, 147-175.

[4] Saito, Mamoru and Tomoko Haraguchi (2012) "Deriving the Cartography of the Japanese Right Periphery: The Case of Sentence-Final Particles," *Iberia* 4.2 (Special Issue in Honor of Andrew Radford), 104-123.

[5] Saito, Mamoru, ed. (2014) *Japanese Syntax in Comparative Perspective*, Oxford University Press, New York, 352pp.

[6] Saito, Mamoru (2014) "Selection and Incorporation in Complex Predicate Formation," in Audrey Li, Andrew Simpson, and Wei-Tien Dylan Tsai, eds., *Chinese Syntax in a Cross-Linguistic Perspective*, Oxford University Press, New York, 251-269.

[7] Saito, Mamoru (2014) "Case and Labeling in a Language without ϕ-feature Agreement," in Anna Cardinaletti, Guglielmo Cinque, and Yoshio Endo, eds., *On Peripheries: Exploring Clause Initial and Clause Final Positions*, Hituzi Syobo Publishing, Tokyo, 269-297.

[8] Saito, Mamoru (2015) "Notes on the Referential Transparency of Perception and Factive Verb Complements," *Nanzan Linguistics* 10, 21-42. (2015)

[9] Saito, Mamoru (2015) "Cartography and Selection: Case Studies in Japanese," in Ur Shlonsky, ed., *Beyond Functional Sequence*, Oxford University Press, Oxford, 255-274.

[10] Saito, Mamoru (2015) "Remnant Movement, Radical Reconstruction, and Binding Relations," in Günther Grewendorf, ed., *Remnant Movement*, Walter de Gruyter, Berlin, 221-256.

Publications in Japanese

[11] Saito, Mamoru (2013)「日本語埋め込み文の意味的・談話的性質―比較統語論への招待」["On the Semantic and Discourse Properties of Embedded Sentences in Japanese: An Invitation to Comparative Syntax"], in Masayuki Ikeuchi and Takuya Goro, eds., 『生成言語研究の現在』*[The Current Stage of Generative Grammatical Research]*, Hituzi Syobo, Tokyo, 221-251.

[12] Saito, Mamoru (2013)「日本語を特徴付けるパラメター再考」["Reconsideration of the

Parameters that Define Japanese Grammar"], in Keiko Murasugi, ed.,『言語の普遍性及び多様性を司る生得的制約—日本語獲得に基づく実証的研究，成果報告書 II』*[Linguistic Variations within the Confines of Language Faculty: Studies in the Acquisition of Japanese and Parametric Syntax, Research Report II]*, The National Institute for Japanese Language and Linguistics and Nanzan University, 1-30.

[13] Saito, Mamoru (2014)「複合動詞の形成と選択制限」["Formation of Complex Verbs and Selectional Restrictions"], in Hideki Kishimoto and Yoko Yumoto, eds.,『複雑述語研究の現在』*[The Current Stage of Research on Complex Predicates]*, Hituzi Syobo, Tokyo, 207-233.

Conference/Workshop Presentations by Invitation

[1] Saito, Mamoru (2011) "The Japanese Right Periphery: Preliminary Results and New Issues," *The National Tsing Hua University Consortium Workshop*, March 5, 2012, National Tsing Hua University, Taiwan. (All presentations by invitation)

[2] Saito, Mamoru (2012) "Cartography and Selection: Case Studies in Japanese," S*yntactic Cartography: Where do we go from here?*, June 7-9, 2012, Université de Genève. (All presentations by invitation)

[3] Saito, Mamoru (2012) "Kuroda's Agreement Parameter Revisited," Formal Approaches to Japanese Linguistics 6, Zentrum für Allgemeine Sprachwissenschaft (ZAS) and Humboldt Universität. (Invited Speaker)

[4] Saito, Mamoru (2013) "Notes on the *v*-V Selectional Relations with Complex Predicates," *The 8th International Workshop on Theoretical East Asian Linguistics*, June 4-5, 2013, National Tsing Hua University, Taiwan. (Invited Speaker)

[5] Saito, Mamoru (2013) "Remnant Movement and Chain Interpretation," *Remnant Movement: An International Conference on Generative Syntax*, June 21-23, 2013, Goethe Universität am Main. (All presentations by invitation)

[6] Saito, Mamoru (2014) "Events and Attitude Reports: A Case Study with Clausal Complementation in Japanese," *LILA '14: Linguistic and Language Conference*, June 16-17, 2014, DAKAM, Istanbul. (Keynote Speaker)

[7] Saito, Mamoru (2014) "Report Phrases and Propositional Attitudes," *International Conference on Generative Linguistics and Philosophy*, June 27-29, 2014, Goethe Universität am Main. (All presentations by invitation)

[8] Saito, Mamoru (2015) "Case for Labeling: A Case Study in a Language without ϕ-feature Agreement," *Rethinking Comparative Syntax* 4, May 7-9, 2015, University of Cambridge. (Invited Speaker)

[9] Saito, Mamoru (2015)「知覚動詞／叙実動詞補文の意味解釈：日本語統語構造からの考察」["The Interpretive Properties of the Complements of Perception and Factive Verbs"], *The 40th Anniversary Meeting of the Kansai Linguistic Society*, June 13-14, 2015, Kobe University. (Invited Lecture)

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Selection and Incorporation in Complex Predicate Formation[1]

Mamoru Saito
Nanzan University and University of Connecticut

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 Úyì 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'.

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[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.'

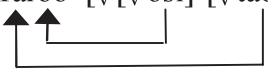
The *soo su* 'do so' test mentioned in the text would classify *yomi-aki* in (i) as a lexical complex predicate, but the possibility seems to remain that *aki* takes a full *v*P complement because the accusative on the object comes from the transitive *yom* rather than the unaccusative *aki*. That is, 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 *os* 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.'

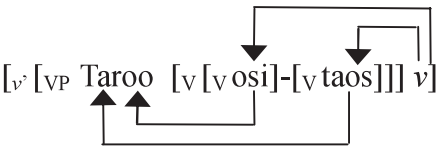
b. *Abura-ga kabe-ni maki-tui-ta
oil-NOM wall-to wind-attach-Past

'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).

(16) 

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/unergave 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 *v*P 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 *v*P 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 Úyì 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 [$_{V'}$ [$_{V}$ [$_{V}$ 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 [$_{V'}$ [$_{V}$ [$_{V}$ 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-drunk 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-drunk 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 *v*P 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 *v*P structure)

b. [$_{vP}$ Ta [$_{v'}$ *v* [$_{VP}$ fan [$_{V'}$ [$_{V}$ [$_{V}$ chi] [$_{V}$ bao]] [$_{VP}$ [$_{V}$ bao]]]]]]

c. [$_{vP}$ Ta [$_{v'}$ [$_{v}$ *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~~

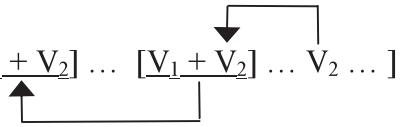
b. covert movement: ~~α~~ … α

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).

(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] … ~~V_2~~ …]

b. [… *v* + [V_1 + V_2] … [V_1 + V_2] … ~~V_2~~ …]

c. [… *v* + [V_1 + V_2] … [~~V_1 + V_2~~] … ~~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 *v*P 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 + ~~V_2~~] … V_2 …]

b. [… *v* + [V_1 + ~~V_2~~] … [V_1 + ~~V_2~~] … V_2 …]

c. [… *v* + [V_1 + ~~V_2~~] … [~~V_1 + V_2~~] … V_2 …]

Then, V_1+~~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 *v*P 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 + ~~V_2~~] … V_2 …]

c. [… v + [$\underline{V_1 + V_2}$] … [$\underline{\sout{V_1 + V_2}}$] … V_2 …]

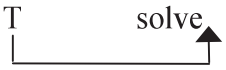
As the incorporation of V_2 is covert, its phonetic features must be deleted at the landing site. This yields (46b). But then, a problem arises with the chain (V_1+V_2, V_1+$\sout{V_2}$). First, the two members of the chain are not identical with respect to phonetic features, and this by itself may cause a problem for the deletion operation. But even if the operation successfully applies, (46c) is derived with the phonetic features of V_2 remaining at the landing site. Note that the same problem arises even if deletion applies to the (V_1+V_2, V_1+V_2) chain first. In this case, the deletion directly yields (46c) from (46a). Since the leftmost V_2 in the v position and the rightmost V_2 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 V_2 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]

(48) [… γ + [β + α] … [β + α] … α …]
(covert) ↓ ┐
(overt) ↑ ┘

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.

References

Baker, Mark and Osamuyimen T. Stewart (1999) "On Double-Headedness and the Anatomy of the Clause," unpublished manuscript, Rutgers University.

Bobaljik, Jonathan D. (1995) *Morphosyntax: The Syntax of Verbal Inflection*, Ph.D. dissertation, MIT.

Chomsky, Noam (1957) *Syntactic Structures*, The Hague: Mouton.

Chomsky, Noam (1995) *The Minimalist Program*, Cambridge, Mass.: MIT Press.

Chomsky, Noam (2012) "Problems of Projection," unpublished manuscript, MIT.

Emonds, Joseph (1978) "The Verbal Complex V'-V in French," *Linguistic Inquiry* 9: 151-175.

Grimshaw, Jane and Armin Mester (1988) "Light Verbs and θ-Marking," *Linguistic Inquiry* 19: 205-232.

Huang, C.-T. James (1992) "Complex Predicates in Control," in Richard K. Larson, et al., eds., *Control and Grammar*, 109-147, Dordrecht: Kluwer Academic Publishers.

Huang, C.-T. James (2006) "Resultatives and Unaccusatives: A Parametric View," *Bulletin of the Chinese Linguistic Society of Japan* 253: 1-43.

Kageyama, Taro (1993) *Bunpoo to Gokeisei [Grammar and Word Formation]*, Tokyo: Hituzi Syobo.

Kageyama, Taro (1999) *Keitairon to Imi [Morphology and Meaning]*, Tokyo: Kuroshio Shuppan.

Li, Yafei (1990) "On V-V Compounds in Chinese," *Natural Language & Linguistic Theory* 8: 177-207.

Li, Yafei (1993) "Structural Head and Aspectuality," *Language* 69: 480-504.

Matsumoto, Yo (1998) "The Combinatory Possibilities in Japanese V-V Lexical Compounds (in Japanese)," *Gengokenkyu* 114: 37-83.

Miyagawa, Shigeru (1989) “Light Verbs and the Ergative Hypothesis,” *Linguistic Inquiry* 20: 659-668.

Saito, Mamoru (2001) “Movement and θ-Roles: A Case Study with Resultatives,” in Yukio Otsu, ed., *The Proceedings of the Second Tokyo Conference on Psycholinguistics*, 35-60, Tokyo: Hituzi Syobo.

Saito, Mamoru and Hiroto Hoshi (2000) “The Japanese Light Verb Construction and the Minimalist Program,” in Roger Martin, et al., eds., *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, 261-295, Cambridge, Mass.: MIT Press.

Simpson, Jane (1983) “Resultatives,” in Lori Levin, et al., eds., *Papers in Lexical-Functional Grammar*, 143-157, Bloomington: Indiana University Linguistics Club.

Stewart, Osamuyimen T. (1998) *The Serial Verb Construction Parameter*, Ph.D. dissertation, Rutgers University.

Tang, Sze-Wing (1997) “The Parametric Approach to the Resultative Construction in Chinese and English,” *UCI Working Papers in Linguistics* 3: 203-226.

Tsujimura, Natsuko (1990) “Ergativity of Nouns and Case Assignment,” *Linguistic Inquiry* 21: 277-287.

Yumoto, Yoko (1997) “Word Formation and the Lexical-Conceptual Structure (in Japanese),” in Publishing Committee, ed., *Gengo to Bunka no Shosoo [Aspects of Language and Culture]*, 105-118, Tokyo: Eihoosha.

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 *t* 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, βP}

b. {αP, βP}

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 αP accompanies Case in (2b), βP provides the label for the whole constituent as αP 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).

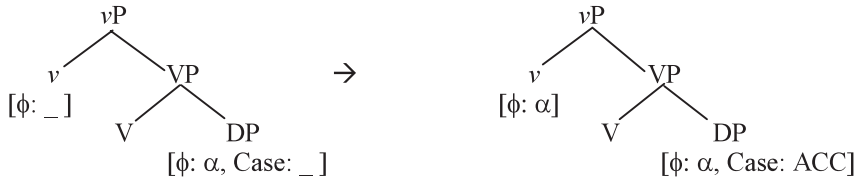
(5) a. Hanako-wa [$_{CP}$ [$_{TP}$ [zibun-no teian]-ga saiyoos-are-ru] to] omot-te i-ru
Hanako-TOP self-GEN proposal-NOM accept-Pass.-Pres. COMP think-Pres.
'Hanako thinks that her proposal will be accepted.'

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*.

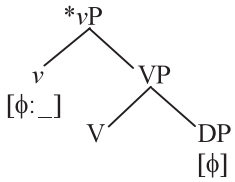
(6)



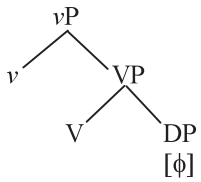
v agrees with the DP and receives the ϕ-feature set of the DP. Crucial in this process is the activation condition that requires the DP to have an unvalued feature of its own to qualify as a goal in the agree relation. In (8), the DP has an unvalued Case feature, and the feature is valued as ACC by virtue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

(7)a. English



b. Japanese



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.'

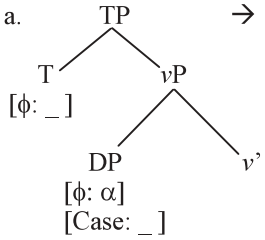
Further, PPs must have genitive Case within a nominal projection whether they are arguments or adjuncts. This is shown in (9).

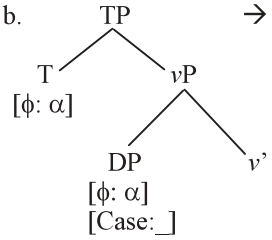
(9) a. Taroo-no tomodati-to-no Yooroppa-e-no ryokoo
Taroo-GEN friend-with-GEN Europe-to-GEN trip
'Taroo's trip to Europe with friends'

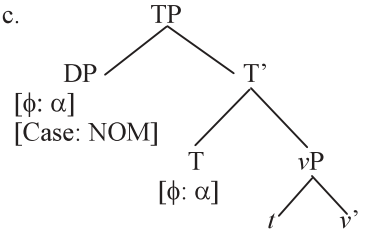
b. Hanako-no muitimon-de-no tookyoo-kara-no syuppatu
Hanako-GEN no.penny-with-GEN Tokyo-from-GEN departure
'Hanako's departure from Tokyo without any money'

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).

(10) a. 

→ b. 

→ c. 

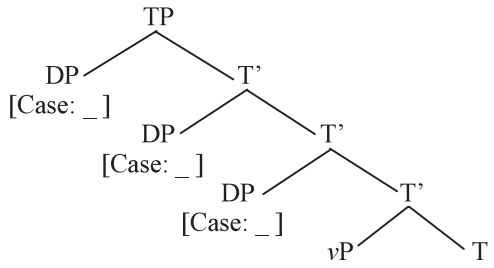
First, T with unvalued ϕ-features probes a DP and has its ϕ-features valued as in (10b). Then, the DP with an unvalued Case feature moves to TP Spec, where it can probe T and obtain nominative, as in (10c). This mechanism of Case valuation is directly applicable to Japanese, which by hypothesis lacks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

(12)



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).

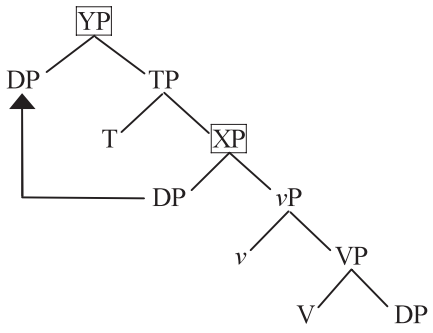
(13) a. {H, αP}

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.

(14)

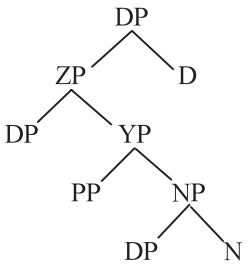


As the structure is constructed bottom-up, the case in (13b) arises first with the merger of DP and *v*P. In this case, the DP moves later to merges with TP. Chomsky proposes that this movement makes *v*P the only element that is properly and immediately contained within {DP, *v*P}, and hence, the syntactic object assumes the label of *v*P 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'

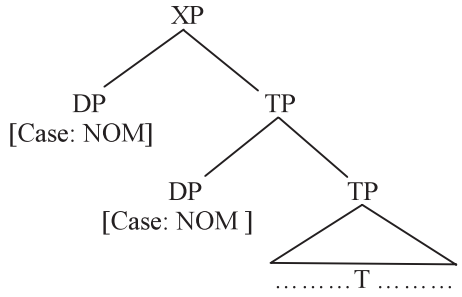


In this example, three arguments are merged with N.[3)] The mergers of the goal PP and the agent DP create the configuration in (13b).

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 *v*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).

(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)]

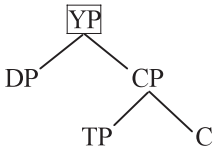
(17) a. Minna-ga [$_{CP}$ Hanako-ga dono hon-o eran-da ka] sir-ita-gat-te i-ru
all-NOM Hanako-NOM which book-ACC choose-Past Q want.to.know-Pres.
'Everyone wants to know which book Hanako chose.'

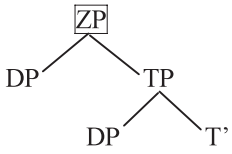
b. Dono hon-o monna-ga [$_{CP}$ Hanako-ga *t* eran-da ka] sir-ita-gat-te i-ru

(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.

(18) a. 

b. 

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).

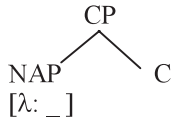
(19) a. Kono heya-wa sizuka-da
this room-TOP quietness-Cop.
'This room is quiet'

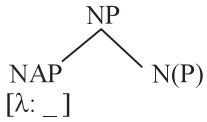
b. sizuka-na heya
quietness-Cop. room
'a quiet room'

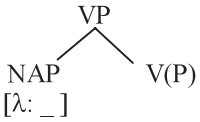
c. Taroo-wa sizuka-ni kaet-ta
Taroo-TOP quietness-Cop. leave-Past
'Taroo left quietly'

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.

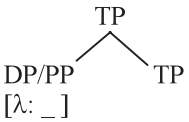
It would be useful to consider the concrete mechanism for the valuation of λ here. Let us first take λ on NAPs. NAPs may merge with C, N(P) and V(P), for example, as in (20).

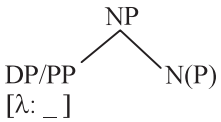
(20) a. 

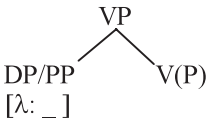
b. 

c. 

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.

(21) a. 

b. 

c. 

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 Ø. 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 {αP, βP} 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-unergative: *moti-aruk* (carry-walk), *sagasi-mawar* (look.for-go.around), *mati-kamae* (wait-hold)

e. unergative-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. unergative-unaccusative: **asobi-oti* (play-fall), **hasiri-korob* (run-tumble)

d. unaccusative-unergative: **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 monomorphic 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.'

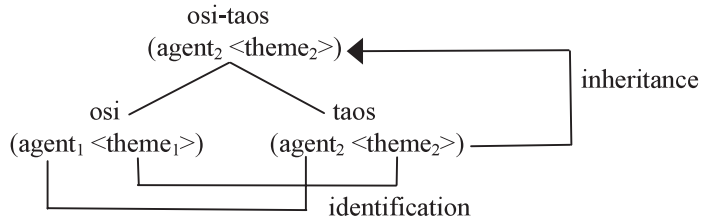
c. Osensui-ga umi-ni nagare-kon-da
contaminated.water-NOM ocean-to flow-KOM-Past
'Contaminated water flowed into the ocean.'

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.'

(34)



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.'

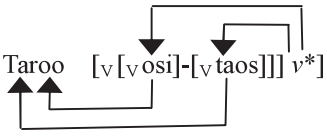
b. *Abura-ga kabe-ni maki-tui-ta
oil-NOM wall-to wind-attach-Past
'The oil twined around the wall.'

(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*.

(38) a. [$_{VP}$ Taroo [$_{V}$ [$_{V}$ osi]-[$_{V}$ taos]]]

b. [$_{v'}$ [$_{VP}$ Taroo [$_{V}$ [$_{V}$ osi]-[$_{V}$ taos]]] *v**]



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)]

(39) a. {V, V}

b. {DP, {V, V}} (= [$_{VP}$ DP [$_{V'}$ V V]])

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 *v*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 {*v*P, *v*P}. The λ-feature on the head of the first *v*P, which is

realized as preverbal inflection on the first verb, makes this *v*P invisible for labeling, and consequently, the second *v*P provides the label for the whole structure. In a similar vain, 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.

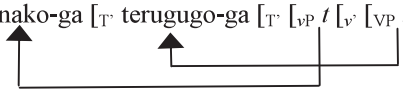
5. Speculations on the Head-Final Phrase Structure

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'

b. [$_{TP}$ Hanako-ga [$_{T'}$ terugugo-ga [$_{T'}$ [$_{vP}$ *t* [$_{v'}$ [$_{VP}$ *t* hanas-e] *v*]] ru]]]



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).

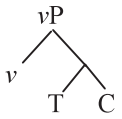
(47) a. Gakusee-ga san-nin terugugo-ga hanas-e-ru
student-NOM three-Classifier Telugu-NOM speak-can-Pres.
'Three students can speak Telugu

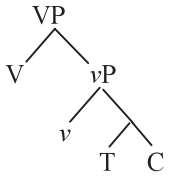
b. ??Gakusee-ga terugugo-ga san-nin hanas-e-ru
student-NOM Telugu-NOM three-Classifier speak-can-Pres.
'Three students can speak Telugu'

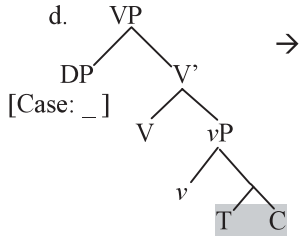
The derivation in (44b) allows *san-nin* 'three-Classifier' to be adjacent to the trace of *gakusei* 'student' and hence, incorrectly predicts (47b) to be grammatical like (46).

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)]

(48) a. 

→ b. 

→ c. 

→ d. 

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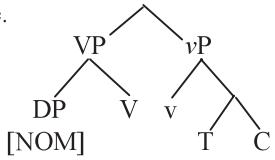
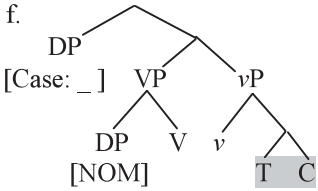
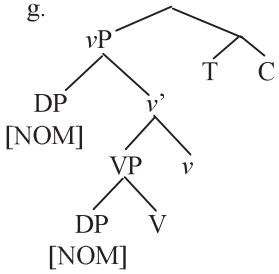
e. 

→ f. 

→ g. 

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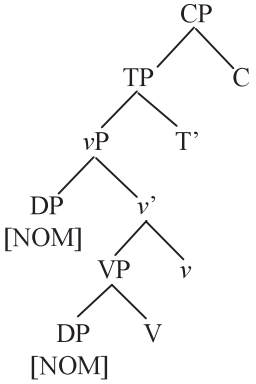
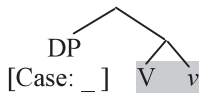
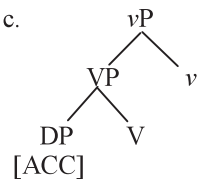
h. 

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.

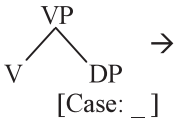
(49) a. 

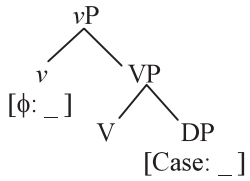
→ b. 

→ c. 

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).

(50) a. 

→ b. 

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

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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 Webelhuth (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.

References

An, Duk-Ho (2009) "A Note on Genitive Drop in Korean." *Nanzan Linguistics* 5: 1-16.

Bobaljik, Jonathan (1995) *Morphosyntax: The Syntax of Verbal Inflection*. Ph.D. dissertation, MIT.

Bošković, Željko (2007) "On the Locality and Motivation of Move and Agree: An Even More Minimalist Theory." *Linguistic Inquiry* 38: 589-644.

Chomsky, Noam (2000) "Minimalist Inquiries: The Framework." In Roger Martin, David Michaels and Juan Uriagereka (eds.), Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik, 89-155. Cambridge, Mass.: MIT Press.

Chomsky, Noam (2008) "On Phases." In Robert Freidin, Carlos P. Otero and Maria Luisa Zubizarreta (eds.), *Foundational Issues in Linguistic Theory: Essay in Honor of Jean-Roger Vergnaud*, 133-166. Cambridge, Mass.: MIT Press.

Chomsky, Noam (2012) "Problems of Projection." Unpublished manuscript, MIT.

Hale, Ken (1980) "Remarks on Japanese Phrase Structure: Comments on the Papers on Japanese Syntax." *MIT Working Papers in Linguistics* 2: 185-203.

Hiraiwa, Ken (2001) "Multiple Agree and the Defect Intervention Constraint." *MIT Working Papers in Linguistics* 40: 67-80.

Huang, C.-T. James (1992) "Complex Predicates in Control." In Richard K. Larson, et al. (eds.), *Control and Grammar*, 109-147. Dordrecht: Kluwer Academic Publishers.

Kageyama, Taro (1993) *Bunpoo to go-keisei* [Grammar and Word Formation]. Tokyo: Hituzi Syobo.

Kayne, Richard S. (1994) *The Antisymmetry of Syntax*. Cambridge, Mass.: MIT Press.

Kim, Soowon (1999) "Sloppy/Strict Identity, Empty Objects, and NP Ellipsis." *Journal of East Asian Linguistics* 8: 255-284.

Kitahara, Hisatsugu (2013) "Simplest Merge and Language Variation." Unpublished manuscript, Keio University.

Koizumi, Masatoshi (1998) "Remarks on Nominative Objects." *Journal of Japanese Linguistics* 16: 39-66.

Kuno, Susumu (1973) *The Structure of the Japanese Language*. Cambridge, Mass.: MIT Press.

Kuroda S.-Y. (1965) *Generative Grammatical Studies in the Japanese Language*. Ph.D. dissertation, MIT.

Kuroda, S.-Y. (1988) "Whether We Agree or Not." *Linguisticae Investigationes* 12: 1-47.

Miyagawa, Shigeru (1989) *Structure and Case Marking in Japanese*. San Diego: Academic Press.

Oku, Satoshi (1988) *A Theory of Selection and Reconstruction in the Minimalist Program*. Ph.D. dissertation, University of Connecticut.

Otani, Kazuyo and John Whitman (1991) "V-raising and VP-ellipsis." *Linguistic Inquiry* 22: 345-358.

Rizzi, Luigi (1982) *Issues in Italian Syntax*. Dordrecht: Foris Publications.

Saito, Mamoru (1989) "Scrambling as Semantically Vacuous A'-movement." In Mark R. Baltin and Anthony S. Kroch (eds.), *Alternative Conceptions of Phrase Structure*, 182-200. Chicago: University of Chicago Press.

Saito, Mamoru (2001) "Movement and θ-roles: A Case Study with Resultatives." In Yukio Otsu (ed.), *The Proceedings of the Second Tokyo Conference on Psycholinguistics*, 35-60. Tokyo: Hituzi Syobo.

Saito, Mamoru (2007) "Notes on East Asian Argument Ellipsis." *Language Research* 43: 203-227.

Saito, Mamoru (2012) "Case Checking/Valuation in Japanese: Move, Agree or Merge?" *Nanzan Linguistics* 8: 109-127.

Saito, Mamoru, T.-H. Jonah Lin and Keiko Murasugi (2008) "N'-Ellipsis and the Structure of Noun Phrases in Chinese and Japanese." *Journal of East Asian Linguistics* 17: 247-271.

Şener, Serkan and Daiko Takahashi (2010) "Argument Ellipsis in Japanese and Turkish." *MIT Working Papers in Linguistics* 61: 325-339.

Shimada, Junri (2007) "Head Movement, Binding Theory, and Phrase Structure." Unpublished manuscript, MIT.

Shinohara, Michie (2006) *Nihongo no koo-sakuzyo gensyoo ni tuite* [On Argument Ellipsis in Japanese], M.A. thesis, Nanzan University.

Takahashi, Masahiko (2010) "Case, Phases, and Nominative/Accusative Conversion in Japanese." *Journal of East Asian Linguistics* 19: 319-355.

Tonoike, Shigeo (2009) "Minimarisuto puroguramu [Minimalist Program]." In Heizo Nakajima (ed.), *Gengogaku no Ryooiki* [Research Areas in Linguistics] I, 135-168. Tokyo: Asakura Shoten.

Ura, Hiroyuki (1999) "Checking Theory and Dative Subject Constructions in Japanese and Korean." *Journal of East Asian*

Linguistics 8: 223-254.

Webelhuth, Gert (1989) *Syntactic Saturation Phenomena and the Modern Germanic Languages*. Ph.D. dissertation, University of Massachusetts, Amherst.

Williams, Edwin (1977) “Discourse and logical form.” *Linguistic Inquiry* 8: 101-139.

Yatsushiro, Kazuko (1999) *Case Licensing and VP Structure*. Ph.D. dissertation, University of Connecticut.

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

Mamoru Saito
Nanzan University

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

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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. ∃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. ∃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. ∃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).

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[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. ∃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. {∃e [laughed (John, e)], ∃e [laughed (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 [an e: hit (Mary, Bill, e)] (at some time t in the past)
c. [∃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. [∃e: [∃x: x a unicorn] hit (x, Bill, e)] Mary sees e (at some time t in the past)
b. [∃e] [∃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. [∃e: hit (Mary, Bill, e)] John sees e (at some time t in the past)
b. [∃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.

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[4] A quantifier Q is *monotone increasing* if [Qx: A(x)] B(x) → [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. [∃e: [∃x: x a person] leave (x, e)] John sees e (at some time t in the past)
b. [∃e] [∃x: x a person] 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) [∃x: x a person] [∃e: 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) [∃e: [∃x: x a kirin] kick (x, 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: φ (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. [∃e: φ (e)] e = e
b. [∃e] φ (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. [∃e: [∃x: x a person] 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 *v*P, 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).

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[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) [∃e: [∃x: x a kirin] kicked (Hanako, x, e)] Hanako regrets e

(53) entails (54a-c).

(54) a. [∃x] x is a kirin
b. [∃e] [∃x: x a kirin] kick (Hanako, x, e)
c. [∃x: x a kirin] [∃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).

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[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) [ιe: [∃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'