

## Selection and Incorporation in Complex Predicate Formation<sup>1</sup>

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### 1. Introduction

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

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

‘Hanako pushed Taroo and made him fall.’

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

‘Ozo pushed Uyi, which made him fall.’

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

‘He drank (wine) and got drunk.’

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

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

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- (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.<sup>2</sup>

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

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<sup>2</sup> 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.<sup>3</sup> 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  $\theta$ -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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<sup>3</sup> It seems to me that the most serious issue is the scope of the generalization rather than its accuracy. As far as I know, there are three kinds of potential counter-examples. The first includes cases where the same verb combines with an unergative verb as well as an unaccusative verb, as in *naki-sakeb* ‘cry-scream’ and *naki-kuzure* ‘cry-collapse’. But *nak*, for example, can mean ‘cry’ or ‘be in tears’ and may be ambiguous between unergative and unaccusative. The second group consists of examples where the second verb is *aki* ‘be bored with, be tired of’, *tukare* ‘be tired with’ or the like, as in (i).

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

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

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

‘Hanako pushed Taroo and made him fall.’

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

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

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

‘An ivy twined around the stick.’

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

‘The wall was stained with oil.’

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

‘The stick was stained with an ivy.’

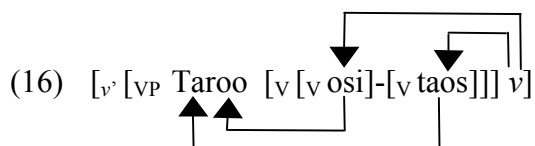
- b. \*Abura-ga kabe-ni maki-tui-ta  
 oil-NOM wall-to wind-attach-Past

‘The oil twined around the wall.’

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

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

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



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

### 3. Complex Predicate Formation with Covert Incorporation

In this section, I assume the account for the restriction on the Japanese lexical complex predicates just presented, and explore its consequences for the analysis of the Japanese light verb construction and the Edo resultative serial verb construction. I argued in Saito (2001) that these constructions involve formation of complex predicates by covert incorporation.<sup>4</sup> 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 [<sub>NP</sub> toti -no zyooto]-o si-ta  
 Hanako-NOM Taroo-DAT land-GEN giving-ACC do-Past

‘Hanako gave a piece of land to Taroo.’

<sup>4</sup> 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 [<sub>NP</sub> 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  $\theta$ -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  $\theta$ -marks *Taroo*.

(18) shows the structure of *vP* in (17a).<sup>5</sup>

- (18) [<sub>vP</sub> Hanako-ga [<sub>v</sub> [<sub>VP</sub> Taroo-ni [<sub>v</sub> [<sub>NP</sub> toti-no [<sub>N</sub> zyooto]]-o [<sub>v</sub> [<sub>N</sub> zyooto] [<sub>v</sub> su]] ] ] v]]
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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  $\theta$ -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  $\theta$ -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

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



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

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

(20) a. \*Taroo-ga sara-kara [<sub>NP</sub> 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 [<sub>NP</sub> 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  $\theta$ -marking, as illustrated in (21) for (20a).

(21) [<sub>VP</sub> Taroo-ga [<sub>v'</sub> [<sub>VP</sub> sara-kara [<sub>v'</sub> [<sub>NP</sub> mizu-no [<sub>N</sub> zyoohatu]]]-o [<sub>v</sub> [<sub>N</sub> zyoohatu] [<sub>v</sub> 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) [<sub>VP</sub> Òzó [<sub>v</sub> v [<sub>VP</sub> Úyì [<sub>v</sub> [<sub>V</sub> [v suá] [<sub>V</sub> dé]]] [<sub>VP</sub> [v dé]] ] ] ] ]
- 

(22a) exhibits the typical resultative paradox, that is, the object *Úyì* receives  $\theta$ -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  $\theta$ -mark *Úyì*. But the incorporation of *dé* to *suá* creates the desired configuration that makes it possible for both *suá* and *dé* to  $\theta$ -mark *Úyì*.<sup>6</sup>

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  $\theta$ -position.

- (24) Hanako-ga Taroo-ni [<sub>NP</sub> 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’  $\theta$ -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. [<sub>v</sub> v [<sub>VP</sub> Úyì [<sub>v</sub> [<sub>V</sub> [v suá] [<sub>VP</sub> [v dé]]] ] ] ] (merger of *v* with VP headed by *suá*)
- b. [<sub>v</sub> [<sub>v</sub> v [<sub>V</sub> suá]] [<sub>VP</sub> Úyì [<sub>v</sub> [<sub>V</sub> suá] [<sub>VP</sub> [v dé]]] ] ] (overt incorporation of *suá* into *v*)
- c. [<sub>v</sub> [<sub>v</sub> v [<sub>V</sub> suá]] [<sub>VP</sub> Úyì [<sub>v</sub> [<sub>V</sub> [v suá] [<sub>V</sub> dé]]] [<sub>VP</sub> [v dé]] ] ] (covert incorporation of *dé*)
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<sup>6</sup> *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 [<sub>CP</sub> that [<sub>TP</sub> 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<sub>i</sub> was pounded *t<sub>i</sub>* flat  
 c. The liquid<sub>i</sub> froze *t<sub>i</sub>* 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).<sup>7</sup> 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*.<sup>8</sup>

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<sup>7</sup> 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.

<sup>8</sup> 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:<sup>9</sup>

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

- (34) a. Lisi qi-lei-le ma le  
 Lisi ride-tired-Asp. horse Asp.  
 (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.<sup>10</sup>

## 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'Ó

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-drank 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).

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<sup>10</sup> 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.

(40) a. [<sub>VP</sub> Òzó [<sub>v</sub> v [<sub>VP</sub> [v ré] [<sub>VP</sub> [v kp`Ol`O]] ] ] ] (Merge to yield the base vP structure)

b. [<sub>VP</sub> Òzó [<sub>v</sub> v [<sub>VP</sub> [v [v ré] [v kp`Ol`O]] [<sub>VP</sub> [v kp`Ol`O]] ] ] ]

c. [<sub>VP</sub> Òzó [<sub>v</sub> v [<sub>VP</sub> [v [v ré] [v kp`Ol`O]]] [<sub>VP</sub> [v [v ré] [v kp`Ol`O]] [<sub>VP</sub> [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  $\theta$ -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).<sup>11</sup>

(41) a. [<sub>VP</sub> Ta [<sub>v</sub> v [<sub>VP</sub> fan [<sub>v</sub> [v chi] [<sub>VP</sub> [v bao]] ] ] ] ] (Merge to yield the base vP structure)

b. [<sub>VP</sub> Ta [<sub>v</sub> v [<sub>VP</sub> fan [<sub>v</sub> [v [v chi] [v bao]]] [<sub>VP</sub> [v bao]] ] ] ]

c. [<sub>VP</sub> Ta [<sub>v</sub> v [<sub>VP</sub> [v [v chi] [v bao]]] [<sub>VP</sub> fan [<sub>v</sub> [v [v chi] [v bao]]] [<sub>VP</sub> [v bao]] ] ] ]

In (41b), *bao* ‘full’ incorporates into *chi* ‘eat’ to form a compound. The compound, then, raises to *v* in (41c), and *bao*  $\theta$ -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  $\alpha$  is  $\alpha$  with its phonetic features deleted.

(42) a. overt movement:  $\alpha$  ...  $\alpha$

b. covert movement:  $\alpha$  ...  $\alpha$

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



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 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).

$$(43) \quad [ \dots \nu + [\underline{V_1 + V_2}] \dots [\underline{V_1 + V_2}] \dots V_2 \dots ]$$

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. [ ...  $[\underline{V_1 + V_2}]$  ...  $\cancel{V_2}$  ... ]  
 b. [ ...  $\nu + [\underline{V_1 + V_2}]$  ...  $[\underline{V_1 + V_2}]$  ...  $\cancel{V_2}$  ... ]  
 c. [ ...  $\nu + [\underline{V_1 + V_2}]$  ...  $[\underline{\cancel{V_1} + V_2}]$  ...  $\cancel{V_2}$  ... ]

Then,  $V_1 + V_2$  incorporates into  $\nu$  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  $\nu P$  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. [ ...  $[\underline{V_1 + \cancel{V_2}}]$  ...  $V_2$  ... ]  
 b. [ ...  $\nu + [\underline{V_1 + \cancel{V_2}}]$  ...  $[\underline{V_1 + \cancel{V_2}}]$  ...  $V_2$  ... ]  
 c. [ ...  $\nu + [\underline{V_1 + \cancel{V_2}}]$  ...  $[\underline{\cancel{V_1} + \cancel{V_2}}]$  ...  $V_2$  ... ]

Then,  $V_1 + \cancel{V_2}$  incorporates into  $\nu$  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  $\nu$ P phase. Consider the configuration in (43) again, repeated here as (46a).

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

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 ( $V_1 + V_2$ ,  $V_1 + \cancel{V_2}$ ). 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  $\nu$  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.<sup>12</sup>

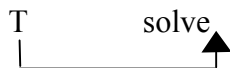
It was shown above that the difference in (38) and (39) between Edo and Chinese can be successfully captured if deletion of phonetic features takes place upon the completion of phase. The contrast between (38) and (39), then, provides evidence that the deletion of phonetic features applies in this way. 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

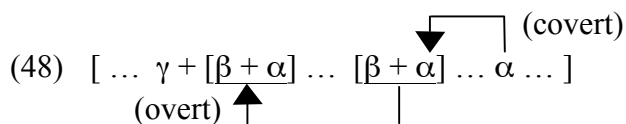


Only auxiliary verbs and *be*-verbs take the first option in English, but as first observed by

<sup>12</sup> 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.

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 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).<sup>13</sup>



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 [<sub>NP</sub> 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 *vP*. 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*

<sup>13</sup> 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.

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

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

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