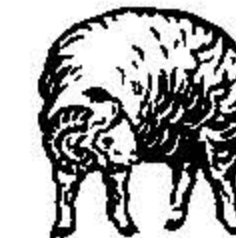




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# Movement and $\theta$ -Roles: A Case Study with Resultatives

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## 1. Introduction

One of the main questions in the current syntactic research is whether configurations for  $\theta$ -role assignment can be created by movement. Positive answers to this question are found in many recent works including Larson 1988, Saito and Hoshi 1993, Lasnik 1995, Boskovic 1997, and Hornstein 1999. The purpose of this paper is to provide further supporting evidence for this hypothesis by investigating the resultative constructions in some languages.

Resultatives are particularly interesting in this context because almost by definition they exhibit "syntax-semantics mismatch." Consider the following English example:

(1) They hammered the metal flat

The NP *the metal* is an argument of both *hammered* and *flat*. If the NP is the complement of the verb, it is unclear how it receives a  $\theta$ -role from the adjective. On the other hand, if the NP is within the projection of the adjective, it is not obvious how it is construed as the theme argument of the verb.

If movement can create a configuration of  $\theta$ -role assignment, there are two possible ways in which an NP can receive  $\theta$ -roles from two distinct heads. First, a  $\theta$ -role assigning head can raise to a higher head position and give an additional  $\theta$ -role to the NP in the higher Spec position. Second, an NP can move to the Spec position of a higher head and pick up an additional  $\theta$ -role. I will argue that these two possibilities are both attested with resultatives.

In the following section, I will briefly go over the analysis of the Japanese light verb construction proposed in Saito and Hoshi 1993, 2000. The purpose of this discussion is to lay down the basic assumptions concerning head movement and  $\theta$ -role assignment. Then, in Section 3, I will argue that the resultative constructions in Edo (Baker and Stewart 1999, henceforth B&S) and Chinese (Huang 1992) involve "head movement for  $\theta$ -role assignment." The differences

between the two languages will be attributed to the difference in the timing of the head movement; it is covert in Edo but overt in Chinese. Section 4 deals with the Japanese lexical V-V compounds, discussed in Kageyama 1993. I will argue that their peculiar properties can be accommodated straightforwardly given the proposals made in this paper. In Section 5, I will turn to English resultatives, and suggest that they are derived by NP movement rather than head movement. Section 6 concludes the paper.

## 2. Head Movement for $\theta$ -Role Assignment

In this section, I will briefly discuss the Japanese light verb construction and argue for the following:

- (2)a. A head can adjoin to another head in order to discharge a  $\theta$ -role.  
(cf. Larson 1988)
- b. This movement is subject to the head movement constraint (HMC).  
(cf. Travis 1984)
- c. An NP can receive  $\theta$ -roles from two distinct heads.

### 2.1. The Japanese Light Verb Construction

The Japanese light verb construction involves the verb *su* 'do'. This verb, like English *do*, can be used as a regular (heavy) verb as in (3).

- (3) Mary-ga [NP (suugaku-no) syukudai] -o sita (= *su* + *ta* (past))  
-NOM math -GEN homework-ACC did  
"Mary did the (math) homework."

But it can also be void of meaning. In (4a), it is combined with a  $\theta$ -role assigning noun and functions as a category-changing suffix.

- (4)a. Mary-ga (kyonen) John-to kekkon -sita  
-NOM last year -with marriage-did (married)
- b. Mary-ga (kyonen) John-to [NP kekkon] -o sita  
-NOM last year -with marriage-ACC did  
"Mary married John (last year)."

(4b) is a variant of (4a), where the  $\theta$ -role assigning noun heads the direct object NP and *su* appears as an independent "expletive verb." This construction is specifically referred to as the Japanese light verb construction since the detailed discussion in Grimshaw and Mester 1988 (henceforth, G&M).

Sells (1988) presents convincing evidence that the accusative noun in (4b) is not an argument, but functions as the predicate of the sentence. Note first

that some of the arguments of the  $\theta$ -role assigning noun can appear within the object NP, as shown in (5a).

- (5)a. Mary-ga John-ni/-e [NP toti -no zyooto]-o sita  
-NOM -to/-to land-GEN giving -ACC did
- b. ??Mary-ga John-ni/-e toti -o [NP zyooto]-o sita  
-NOM -to/-to land-ACC giving -ACC did  
"Mary gave a piece of land to John."

In the case of (5a), the example becomes marginal if all arguments are realized outside the NP, as (5b) shows. This is because Japanese prohibits two accusative NPs within a simple sentence.

Here, as Sells points out, it is striking that (5b) is only marginal. As discussed in Harada 1973, Shibatani 1973 and Kuroda 1978, Japanese sentences with two accusative NPs exhibit two distinct patterns. When two argument NPs appear with accusative Case, the example is hopeless. (6b) exemplifies this pattern.

- (6)a. Mary-ga John-o hasir-aseta  
-NOM -ACC run -made  
"Mary made John run."
- b. \*Mary-ga John-o biiru-o nom -aseta  
-NOM -ACC beer-ACC drink-made  
"Mary made John drink beer."

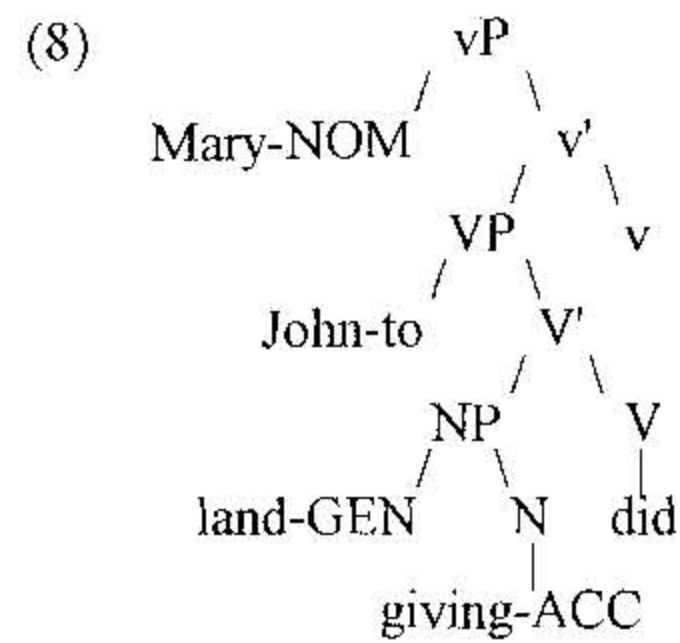
On the other hand, adverbials can sometimes be marked by *-o* in Japanese. And when one of the two accusative NPs is an adverbial, the result is only marginal as (7) indicates.

- (7)??Mary-ga John-o hamabe-o aruk -aseta  
-NOM -ACC beach -ACC walk-made  
"Mary made John walk on the beach."

Sells notes that (5b) clearly patterns with (7), which implies that the example does not contain two argument accusative NPs. Since *toti-o* 'land-ACC' is obviously an argument, it follows that *zyooto-o* 'giving-ACC' is not. Then, the only plausible interpretation for the latter is that it is a predicate.

Given the predicate status of the  $\theta$ -role assigning noun in the light verb construction, Saito and Hoshi (1993, 2000) proposed a covert incorporation analysis. According to this analysis, (5a), for example, has the structure shown in (8).





The  $\theta$ -role assigning noun 'giving-ACC' first discharges the theme role to 'land-GEN' within the NP. Then, it raises covertly to the position of the light verb and assigns the goal role to 'John-to'. Finally, the N-V complex adjoins to *v*, which makes it possible for the N to assign the agent role to 'Mary-NOM' jointly with the *v* head.

Among the evidence for this analysis is the following contrast:

- (9)a. [CP Op<sub>i</sub> [IP Mary-ga John-ni/-e t<sub>i</sub> zyooto-o sita] no] -wa  
 -NOM -to/-to giving -ACC did COMP-TOP  
 toti -o<sub>i</sub> da  
 land-ACC is  
 "It is a piece of land that Mary gave to John."  
 (Lit. It is a piece of land that Mary did giving to John.)
- b. \*[CP Op<sub>i</sub> [IP Mary-ga John-ni/-e toti -o t<sub>i</sub> sita] no] -wa  
 -NOM -to/-to land-ACC did COMP-TOP  
 zyooto-o<sub>i</sub> da  
 giving -ACC is  
 (Lit. It is giving that Mary did a piece of land to John.)

Both (9a) and (9b) are cleft versions of (5b). In (9a), the theme argument *toti-o* 'land-ACC' is focused, and the example is fine. It is in fact better than (5b) since one of the accusative NPs is dislocated. (9b), on the other hand, focuses the NP headed by the  $\theta$ -role assigning noun 'giving-ACC', and is hopeless.<sup>1</sup> The ungrammaticality of this example follows from the covert head movement analysis. The  $\theta$ -role assigning noun 'giving-ACC' must move covertly to the position of the light verb in order to discharge its theme and goal  $\theta$ -roles. But this is impossible in the case of (9b) because the noun is clefted and hence is outside the c-command domain of the light verb.

## 2.2. Implications of the Covert Head Movement Analysis

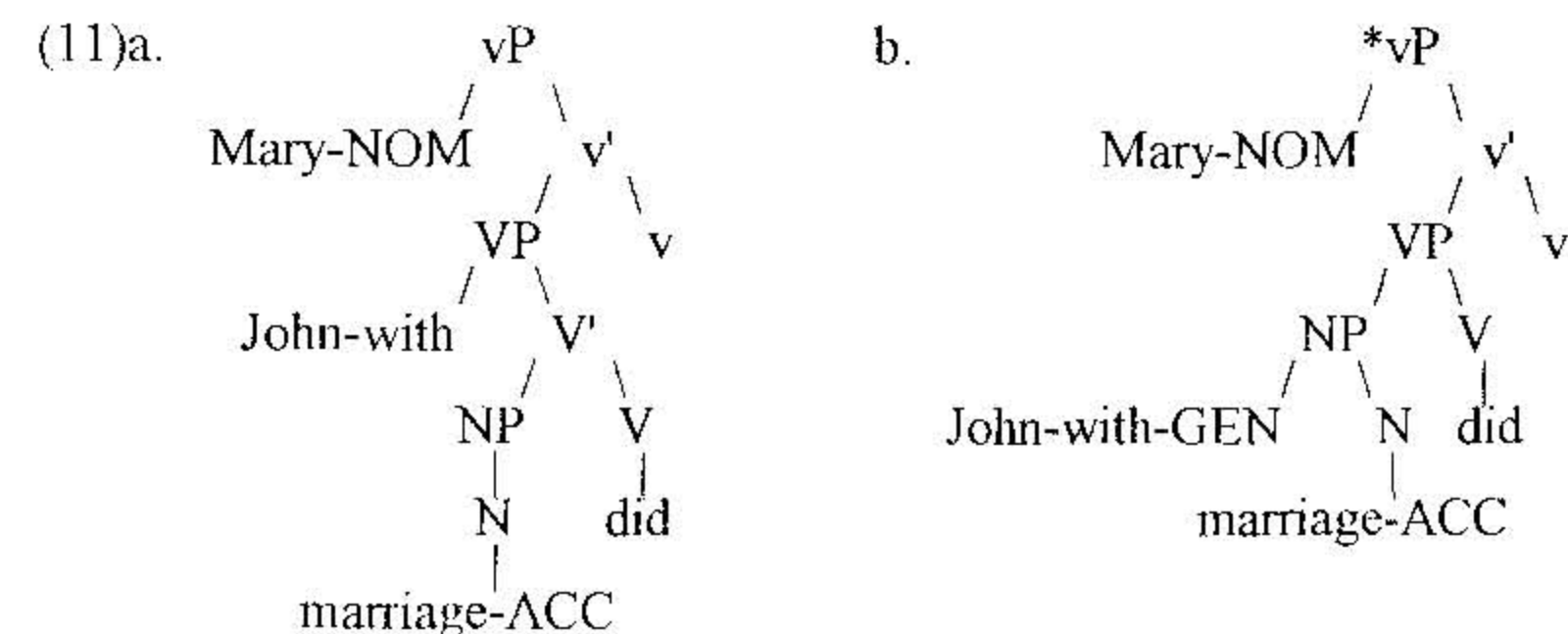
The analysis of the Japanese light verb construction briefly introduced above implies that a  $\theta$ -role assigning head can adjoin to another head and discharge its  $\theta$ -roles from the adjoined position. Further examination of related data reveals the more precise nature of head movement of this kind.

Let us first consider a constraint on this type of movement. G&M note some important generalizations on the Japanese light verb construction. Among them is that at least one internal  $\theta$ -role of the  $\theta$ -role assigning noun must be discharged to an argument outside the NP. Thus, (10a-b) are marginally acceptable with the interpretation of *su* as a regular (heavy) verb, but they are ungrammatical as examples of the light verb construction.

- (10)a. ?Mary-ga [NP John-to -no kekkon]-o sita  
 -NOM -with-GEN marriage-ACC did  
 "Mary married John."  
 b. ?Mary-ga [NP John-e -no toti -no zyooto]-o sita  
 -NOM -to-GEN land-GEN giving -ACC did  
 "Mary gave a piece of land to John."

(10a), for example, means that "there is a specific act of getting married with John, and Mary did it."

Given the covert head movement analysis, G&M's generalization can be explained in terms of the head movement constraint (HMC) proposed by Travis (1984). The structures of the grammatical (4b) and the ungrammatical (10a) are shown in (11a) and (11b) respectively.



In (11a), the N 'marriage' needs to assign a  $\theta$ -role to 'John-with'. Hence, the N raises to V, and the N-V complex moves to *v*. In (11b), on the other hand, the N need not raise to V, but must move to *v* to discharge its external  $\theta$ -role. Thus, if head movement requires a "reason," the HMC, which prohibits a head from moving over another head, explains the ungrammaticality of (10a). The



N 'marriage' in (11b) cannot move to V because it has no reason to do so. At the same time, the HMC prohibits the direct movement of N to v. Hence, the N fails to assign its external  $\theta$ -role to 'Mary-NOM'. G&M's generalization, then, indicates that the covert head movement in the Japanese light verb construction is subject to the HMC, as expected.

G&M note further that there is a construction quite similar to the light verb construction that should be analyzed basically in the same way. An example is given in (12b). (See also Matsumoto 1992.)

- (12)a. John-ga Mary-kara [<sub>NP</sub> hooseki-no ryakudatu]-o sita  
 -NOM -from jewelry-GEN plunderage-ACC did  
 "John stole jewelry from Mary."  
 b. John-ga Mary-kara [<sub>NP</sub> hooseki-no ryakudatu]-o kokoromita  
 -NOM -from jewelry-GEN plunderage-ACC attempted  
 "John attempted to steal jewelry from Mary."

(12b) is exactly like (12a) except that a control verb *kokoromita* 'attempted' appears in place of the light verb. What is important here is that the source argument of the  $\theta$ -role assigning noun *ryakudatu* 'plunderage' appears outside the NP at the sentential level in (12b) exactly as in (12a). As I appealed to covert head movement to account for this "mismatch" in the case of (12a), it is only natural to employ the same mechanism for (12b). Then, the N *ryakudatu* 'plunderage' in (12b) raises covertly to the position of *kokoromita* 'attempted' and discharges its source role to 'Mary-from'.

However, (12b) has an implication that (12a) does not. In this example, the subject *John-ga* 'John-NOM' receives a  $\theta$ -role from the matrix verb *kokoromita* 'attempted'. Then, how is the external  $\theta$ -role of the N *ryakudatu* 'plunderage' assigned? It cannot be that there is a PRO in NP Spec and this PRO receives the  $\theta$ -role. If so, the N must assign the agent role before it raises covertly and discharges the source role, in contradiction with the thematic hierarchy. The only possibility, then, is that the N assigns its external role directly to *John-ga* 'John-NOM'. This in turn implies that an NP can receive  $\theta$ -roles from two distinct heads.

### 3. Resultative Constructions in Edo and Chinese

In this section, I will first discuss the Edo resultative serial verb construction, examined in detail by Stewart (1998) and B&S. I will argue that the proposals in the preceding section directly account for its main properties. Then, I will consider the resultative V-V compounds in Chinese. As discussed

in Li 1990 and Huang 1992, Chinese is more permissive than Edo in the possible combination of verbs. I will show that this also follows from the proposals in the preceding section.

#### 3.1. The Edo Serial Verb Constructions

B&S argue that there are three distinct kinds of serial verb constructions in Edo. They are illustrated in (13) below.

- (13)a. *Òzó ghá gbè èwé khièn ùhùnmwùn érèn* (covert coordination)  
 Ozo FUT hit goat sell head its  
 "Ozo will kill the goat and sell its head."  
 b. *Òzó ghá gbè èwé khièn* (consequential SVC)  
 Ozo FUT hit goat sell  
 "Ozo will kill the goat and sell it."  
 c. *Òzó ghá gbè èwé wù* (resultative SVC)  
 Ozo FUT hit goat die  
 "Ozo will strike the goat dead."

(13a), which represents the first kind, contains two transitive verbs with their objects overtly expressed. The second kind, exemplified in (13b), also contains two transitive verbs but the object of the second verb is missing. (13c), with an unaccusative second verb, is an example of the third kind. I am interested here in the third kind, which B&S call the resultative SVC. But before going into the main discussion, I will briefly show how the three kinds of serial verb constructions are distinguished.

According to B&S, covert coordination and consequential SVC pattern differently with respect to the scope of the adverbials that appear right before the first verb. In the covert coordination (14a), the adverb 'quickly' modifies only the first verb-object pair. So, Ozo may not have peeled the corn quickly.

- (14)a. *Òzó gié!gié gbó!ó ívìn bọ́lọ́ òkà*  
 Ozo quickly plant coconut peel corn  
 "Ozo quickly planted the coconut and [he] peeled the corn."  
 b. *Òzó gié!gié dún!mwún èmà khièn!-né*  
 Ozo quickly pound yam sell -PL  
 "Ozo quickly pounded the yams and sold them."

In the consequential SVC (14b), on the other hand, 'quickly' modifies both verbs. This indicates that covert coordination involves conjunction of larger constituents than consequential SVC.



Adverbs also distinguish between consequential SVC and resultative SVC. As shown in (15a), 'quickly' can be placed right before the second verb in consequential SVC.

- (15)a. Òzó lé èvbàré rhé!rhé ré  
 Ozo cook food quickly eat  
 "Ozo cooked the food and quickly ate it."  
 b. \*Úyi gbé Òzó rhé!rhé wú  
 Uyi hit Ozo quickly die  
 "Uyi beat Ozo so that he died quickly."

(15b) shows that this is impossible in the case of resultative SVC.

B&S point out an even more striking difference between consequential SVC and resultative SVC: only the latter involves true argument sharing. That is, in (13b) there is an empty object for the verb 'sell', but in (13c) the NP 'goat' serves as an argument for both 'hit' and 'die'. The evidence comes from the distribution of *tòbòrè* 'by self'. This element is associated with the NP that immediately precedes it, as illustrated in (16a-c).

- (16)a. Òzó tòbòrè ghá gié!gié lé èvbàré  
 Ozo by self FUT quickly cook food  
 b. Òzó ghá (gié!gié) tòbòrè lé èvbàré  
 Ozo FUT quickly by self cook food  
 "Ozo will quickly cook the food by himself."  
 c. Òzó miánmián yá tòbòrè lé èvbàré  
 Ozo forgot to by self cook food  
 "Ozo forgot to cook the food by himself."

In (16b) the element is associated with the vP-internal trace of 'Ozo', and in (16c) with the vP-internal trace of the PRO controlled by 'Ozo'.

Let us now consider the examples in (17) in light of the distribution of *tòbòrè*.

- (17)a. Òtásówié dé éwù yó \_ tòbòrè  
 Otasowie buy dress wear by self  
 "Otasowie bought the dress and wore it by itself."  
 b. \*Òzó sùá ògò dé \_ tòbòrè  
 Ozo push bottle fall by self  
 "Ozo pushed the bottle down by itself."

The consequential SVC in (17a) is fine, which indicates that the verb 'wear' is

followed by an empty object that refers to the dress. On the other hand, there is no such empty object in the resultative SVC in (17b), for otherwise the example should be allowed. Note that an unaccusative verb can be followed by *tòbòrè* when there is a trace in the object position.

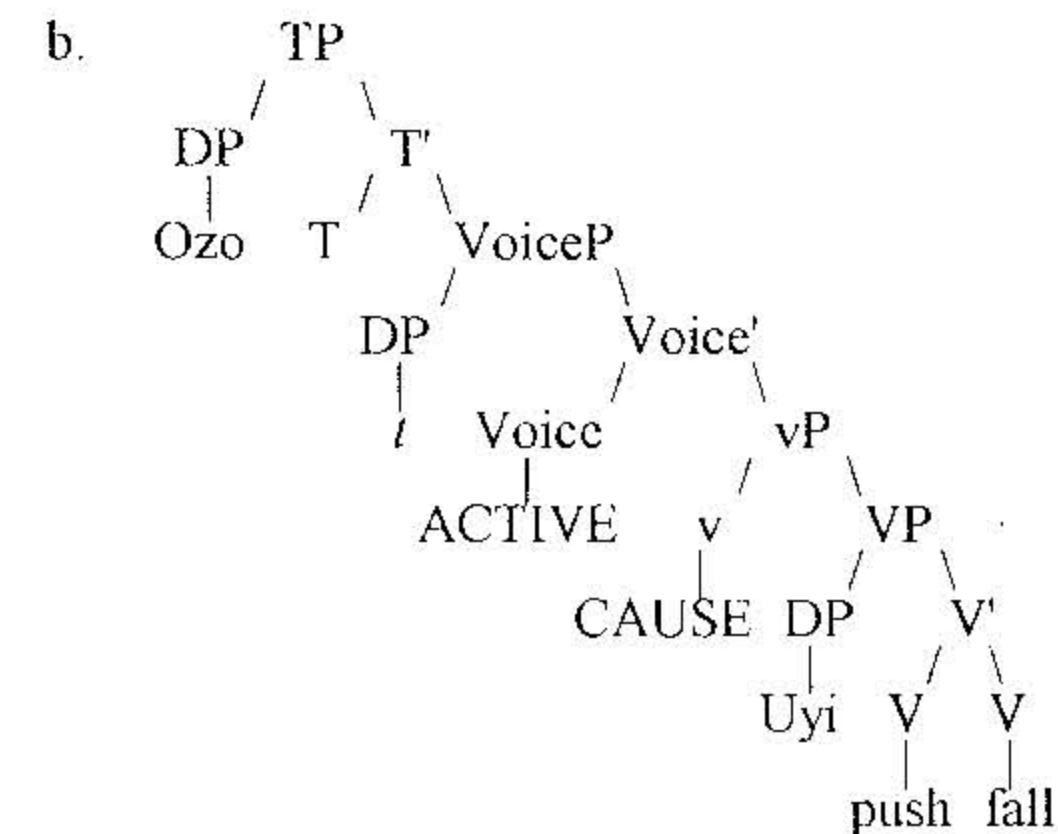
- (18) Úyi dé \_ tòbòrè  
 Uyi fall by self  
 "Uyi fell by himself."

Thus, there is not even a trace following the second verb in (17b). Then, 'die' must assign its theme role directly to the NP 'goat' in (13c).

### 3.2. Argument Sharing in the Resultative SVC

As reported in the preceding section, B&S show persuasively that there is true argument sharing in the case of the resultative SVC. Thus, in (13c), 'goat' receives  $\theta$ -roles from both 'hit' and 'die'. They also offer an analysis for this argument sharing. Generally, they propose "double-headed structures" for all of the serial verb constructions in (13). In particular, they assign the structure in (19b) to the resultative SVC in (19a).

- (19)a. Òzó suá Úyi dé  
 Ozo push Uyi fall  
 "Ozo pushed Uyi, causing him to fall."



In this structure, the VP is double-headed, which allows both 'push' and 'fall' to assign  $\theta$ -roles to 'Uyi'.

Although (19b) successfully accounts for the object sharing between 'push' and 'fall', it does not quite capture all of B&S's insights on the resultative SVC. They write,

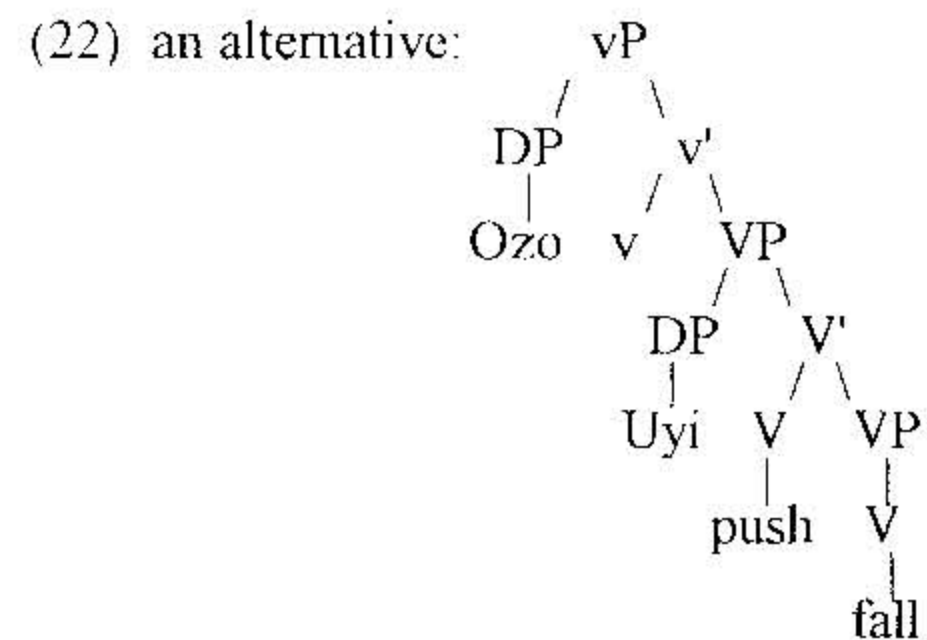
- (20) "..., the second verb of an RSVC [resultative SVC] has a somewhat paradoxical behavior: it acts as the complement of the first verb in some respects and as its cohead in other respects." (p.44)

That is, the second verb 'fall' in (19) not only assigns a  $\theta$ -role to 'Uyi' but also serves as the complement of the first verb 'push'. To substantiate this claim, B&S point out that the second verb shares the distribution of a delimiting goal expression, which "must be generated in the (unique) complement position of V" (p.41). Thus, a sentence cannot have two delimiting goal expressions as shown in (21a).

- (21)a. \*Òzó fì àkhé yè òtikù fuá  
Ozo throw pot in trash away  
b. \*Òzó fì àkhé fuá guòghò  
Ozo throw pot away break  
"Ozo threw the pot away so that it broke."

(21b) shows that a resultative SVC cannot have even one. This suggests that the second verb occupies the (unique) complement position of the first verb in resultative SVC. The structure in (19) at least does not directly represent this relation.

Given the discussion in Section 2, however, an alternative analysis of the resultative SVC suggests itself. In the discussion of the Japanese light verb construction, it was argued that a head can adjoin to another head in order to discharge its  $\theta$ -roles. Further, evidence was presented that two heads can assign  $\theta$ -roles to a single NP. Those proposals make it possible to assume the structure in (22) for (19a).



Here, 'push' first discharges its theme role to 'Uyi'. It then moves overtly to v, which accounts for the surface word order. At this point, it assigns the agent role to 'Ozo' together with v. The second verb 'fall' covertly adjoins to the initial position of the first V, and assigns its theme role to 'Uyi'. (22), like (19b),

successfully accounts for the object sharing. Further, in (22), the second verb is literally the complement of the first. This analysis, then, seems to be an improvement over the one based on (19b).

The analysis proposed above also enables us to explain another interesting property of the Edo resultative SVC. B&S report that only transitive-unaccusative and unaccusative-unaccusative patterns are attested in this construction. (13c) and (19a) represent the transitive-unaccusative pattern. An example of the unaccusative-unaccusative combination is shown in (23).

- (23) Òmó dé (\*gié!gǐé) wú  
child fall quickly die  
"The child fell and (\*quickly) died."

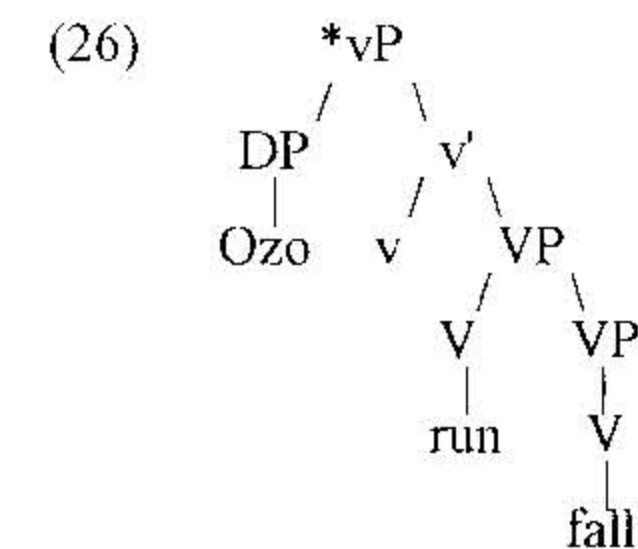
(23) can be given basically the same structure as (22), but without the v-projection. More interesting are the missing cases, especially the fact that the first verb can never be unergative. The examples in (24) illustrate this case.

- (24)a. \*Òzó rhùl'E dé  
Ozo run fall  
"Ozo ran and fell."  
b. \*Òzó ré kp'Ol'O  
Ozo ate be big  
"Ozo ate himself fat."

The generalization here is more precisely that the second verb cannot share the external argument of the first verb. Thus, *dá* 'drink' can be transitive or unergative, and (25) is ungrammatical in either case.

- (25) \*Òzó dá (ày'On) mu'Emu'E  
Ozo drink palm wine be sluggish  
"Ozo drank palmwine until he was sluggish."

Given the analysis suggested above, (24a) has the structure in (26).



Here, 'run' moves overtly to v and assigns its external role to 'Ozo' jointly with



v. What about 'fall'? It has no reason to move to the initial position of 'run', but must move to v to assign its theme role to 'Ozo'. This means that if head movement requires a "reason," 'fall' must move directly to v skipping the head V of the higher VP. Then, the required movement of 'fall' in (26) necessarily violates the HMC, and consequently the verb fails to discharge its  $\theta$ -role.

Note that the account proposed above for (24a) is identical in form to the account for the Japanese light verb examples in (10). In both cases, a head needs to move to v to properly assign its  $\theta$ -role, but the movement is blocked by an intervening V. We thus have a unified explanation for two seemingly unrelated phenomena.<sup>2</sup>

### 3.3. The Chinese Resultative V-V Compounds

So far, I have argued that the covert head movement analysis of the Japanese light verb construction proposed in Saito and Hoshi 1993, 2000 applies directly to the Edo resultative SVC. Chinese resultative compounds present an interesting challenge to this analysis as they exhibit patterns that are quite different. In this section, I will briefly discuss them and argue that they are not problematic, but instead provide further supporting evidence for our analysis.

Chinese has a productive resultative V-V compound construction as discussed in detail in Li 1990, 1993 and Huang 1992. The examples in (27) are from Li 1990, and those in (28) are from Huang 1992.

(27)a. Baoyu xia -shu -le qi  
play-lose-asp chess  
"Baoyu played chess (and as a result he) lost it."

b. Baoyu qi -lei -le neipi ma  
ride-tired-asp that horse  
"Baoyu rode the horse (and as a result the horse got) tired."  
"Baoyu rode the horse (and as a result he got) tired."

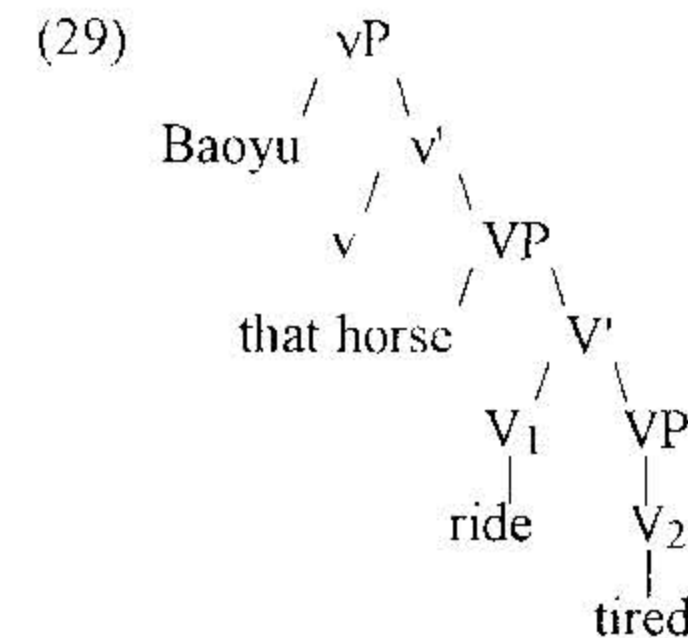
c. Daiyu ku -zou -le henduo keren  
cry-leave-asp many guest  
"Daiyu cried (so much that) many guests left."

(28)a. Ta chi-bao (fan) le  
he eat-full rice asp  
"He ate (rice) and got full."

b. Ta he -zui (jiu) le  
he drink-drunk wine asp  
"He drank (wine) and got drunk."

As these examples indicate, the Chinese construction is quite permissive. It allows the transitive-transitive combination as in (27a), and also examples like 'run the pavement thin' in English as (27c) shows.<sup>3</sup> I do not have much to say about (27a) and (27c), except that they seem to indicate that Chinese is more "generous" in its Case system than languages like Edo. But I would like to take up the fact that (27b) is ambiguous and also the fact that (28a-b) are grammatical, as these bear directly on the analysis proposed for Edo.

Let us first consider (27b), whose structure is shown in (29).

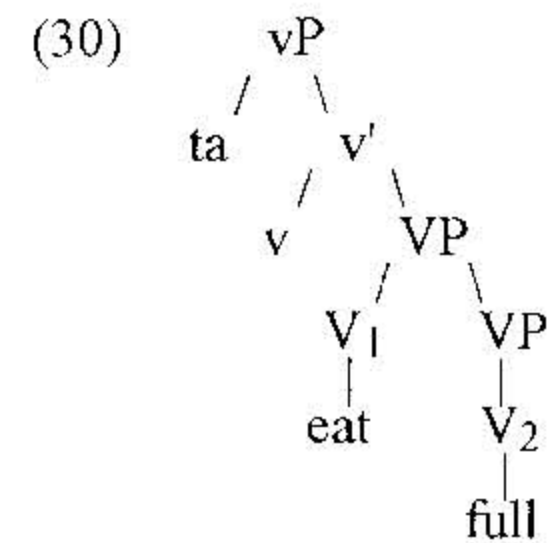


This structure is exactly like the Edo (22). Hence, it is predicted that 'tired' can raise to the position of V<sub>1</sub> and  $\theta$ -mark 'that horse'. This results in the reading where it is the horse that became tired. But the example allows another reading, which is that Baoyu rode the horse and as the result he became tired. This requires 'tired' to raise to v and assign its  $\theta$ -role to 'Baoyu'. And this is precisely what was impossible in the Japanese light verb construction and the Edo resultative SVC because of the HMC. Thus, the ambiguity of (27b) seems to pose a problem.

But, there is one crucial difference between the Chinese V-V resultative construction on the one hand, and the Japanese light verb construction and the Edo resultative SVC on the other. The Chinese construction involves V-V compounds. This means that the second verb adjoins to the first overtly due to a morphological reason. So, independently of the  $\theta$  requirements, 'tired' in (29) adjoins to 'ride' and then the V-V complex moves to v in the overt syntax. If 'tired' discharges its  $\theta$ -role to 'that horse' at the point it adjoined to 'ride', we obtain the interpretation where the horse gets tired. On the other hand, if 'tired' assigns its  $\theta$ -role to 'Baoyu' after the 'ride-tired' complex adjoins to v, then 'Baoyu' will be the one that becomes tired. Thus, in (29), 'tired' can assign its  $\theta$ -role to 'Baoyu' without moving across another head. The ambiguity of (27b), hence, follows from the fact that morphology requires the second verb to adjoin to the first, independently of  $\theta$ -role assignment.



Huang's examples in (28) can be analyzed in the same way. Let us consider (28a) without the object 'rice'.



The second verb 'full' overtly adjoins to 'eat' so that the compound 'eat-full' is formed. The compound then raises to v. The two verbs at this point assign their  $\theta$ -roles to 'he'. Thus, the example can be derived without a violation of the HMC. The apparently problematic examples in Chinese, then, actually provide supporting evidence for the analysis proposed in the preceding sections.

#### 4. The Japanese V-V Compounds

The Japanese V-V compounds, discussed in Kageyama 1993 and Li 1993, also provide a good testing ground for the analysis proposed so far. They are similar to the Chinese resultative V-V compounds, but as will be shown below, require a different analysis. I will argue in this section that they too provide supporting evidence for the proposals made in the preceding sections, but in a different way.

##### 4.1. Kageyama's (1993) Arguments for Lexical Analysis

Some examples of Japanese V-V compounds from Kageyama 1993 are listed below.<sup>4</sup>

(31)a. transitive-transitive:

*kai-toru* 'buy-take', *nigiri-tubusu* 'grasp-crash'

b. unergative-unergative:

*kake-yoru* 'run-go close to', *tobi-oriru* 'jump-go down'

c. unaccusative-unaccusative:

*suberi-otiru* 'slip-fall', *umare-kawaru* 'be born-change'

d. unergative-transitive:

*naki-harasu* 'cry-make swollen', *warai-tobasu* 'laugh-fly'

e. transitive-unergative:

*moti-aruku* 'carry-walk', *nomi-aruku* 'drink-walk'

As the list shows, the possible patterns of the combination of verbs are quite extensive. This is expected because we are dealing with V-V compounds here as in the case of Chinese.

At first sight, it appears that the analysis of Chinese resultative V-V compounds can be applied directly to Japanese. Let us consider *naki-haras* 'cry-make swollen'. As shown in (32), *naki* is unergative and *haras* is transitive. The compound appears in examples like (33).

(32)a. Taroo-ga naku

-NOM cry

"Taroo cries."

b. Taroo-ga me-o harasita

-NOM eye-ACC made-swollen

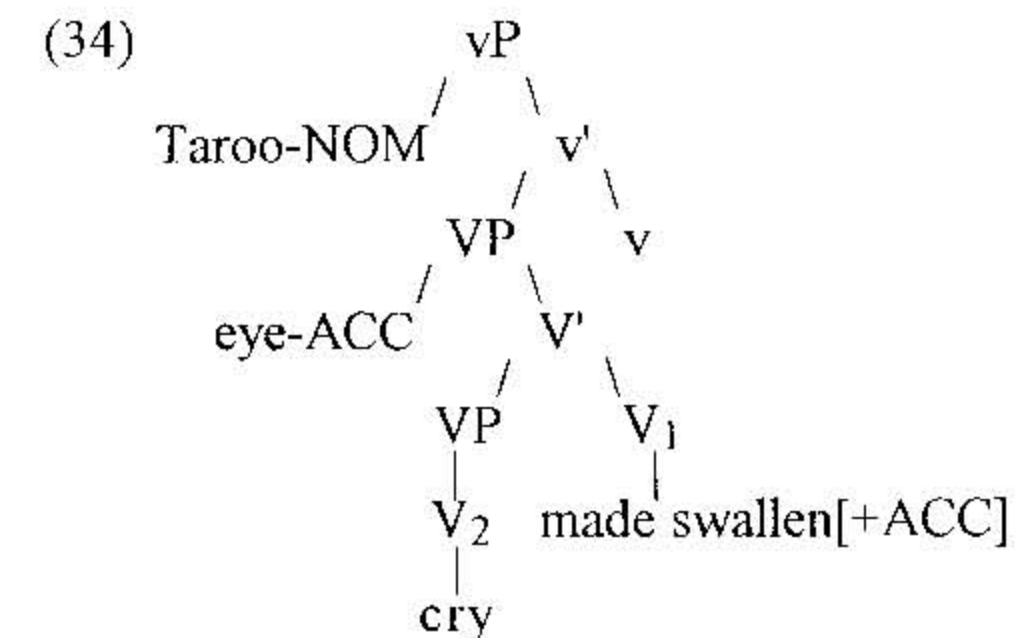
"Taroo made his eyes swollen"

(33) Taroo-ga me-o naki-harasita

-NOM eye-ACC cry -made swollen

"Taroo cried, and as a result, made his eyes swollen."

A possible structure for (33) is shown in (34).



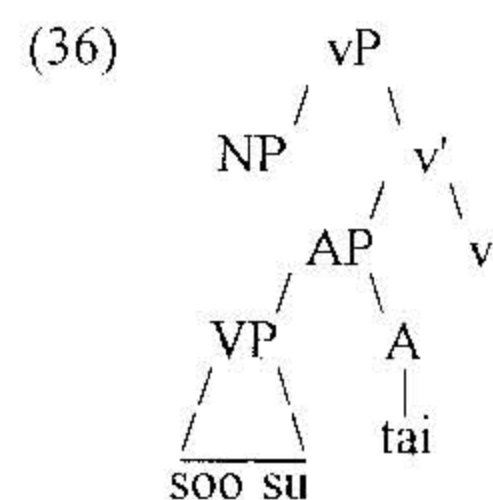
Here, 'cry' must assign a  $\theta$ -role to 'Taroo'. This is possible because it raises overtly to the position of 'make swollen' to form a compound. If the V-to-v movement is covert in Japanese as I have been assuming, the V-V complex raises to v in the covert component and each verb assigns its external role to 'Taroo'. As in the cases of the Chinese examples in (27b) and (28a-b), no head movement across another head is required.

But Kageyama (1993) argues persuasively that Japanese V-V compounds are not formed by incorporation in the syntax but are lexical compounds. One of his arguments is based on the distribution of the pro-VP form *soo su* 'do so'. He hypothesizes that complex predicates of the forms *V-sase* 'V-cause', *V-(rar)* 'V-can', *V-ta* 'V-want' are generated from complex syntactic structures

through incorporation. This accounts for the fact that *soo su* can combine with the causative *sase*, the potential (*rar*)*e*, and the desi-derative *ta*. Some examples are shown in (35).

- (35)a. *soo s -aseru*  
 so do-cause (pres)  
 "cause to do so"
- b. *soo si -tai*  
 so do-want (pres)  
 "want to do so"

(35b), for example, can be assigned the following structure:



Here, *soo su* is the VP, and the complex predicate *si-tai* is formed by the incorporation of the verb *su* to the adjective *tai*.

On the other hand, V-V compounds are incompatible with the *soo su* form.

- (37)a. \**soo si -harasu*  
 so do-make swollen (pres)  
 "make swollen by doing so"
- b. \**soo si -otiru*  
 so do-fall (pres)  
 "fall by doing so"

This is mysterious if V-V compounds are formed by incorporation exactly like complex predicates. Kageyama concludes then that V-V compounds are formed in the lexicon. If the second verbs in (37) never take phrasal complements, there is no way for them to combine with *soo su*.

Kageyama, further, offers an explanation for why resultative V-V compounds cannot be formed by incorporation in Japanese. (See also Li 1993.) Let us compare the Chinese (38a) and the Japanese (38b).

- (38)a. *Baoyu qi -lei -le neipi ma*  
 ride-tired-asp that horse  
 "Baoyu rode the horse (and as a result he/the horse got) tired."

- b. *Taroo-ga me-o naki-harasita*  
 -NOM eye-ACC cry -make swollen  
 "Taroo cried (and as a result he) made his eyes swollen."

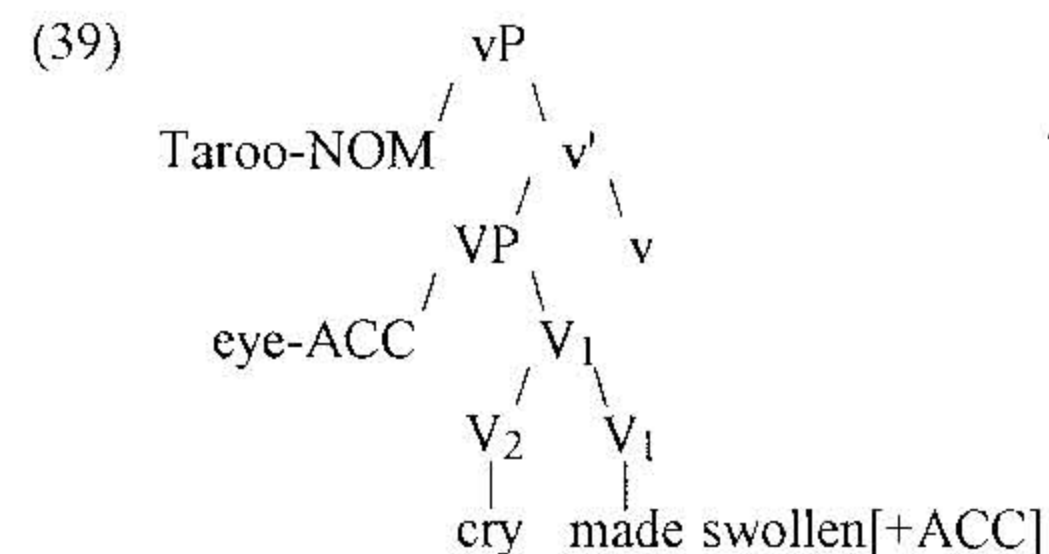
In both cases, the first member of the compound expresses the cause and the second the result. It has been shown by Carrier and Randall (1992) and others that in a resultative construction the result phrase can be the complement of the verb expressing the cause. Since Chinese is head-initial in the verb-complement structure, (29) is in fact a possible structure for (38a).

On the other hand, Japanese is uniformly head-final. So, in (34), the verb expressing the result takes the cause phrase as its complement. But this, Kageyama argues, should be impossible. The embedded VP in (34) is after all a reason phrase, and hence, should be an adjunct rather than a complement. If the embedded VP is an adjunct, it follows that (38b) cannot be derived by incorporation: Baker (1986) has shown that incorporation is possible only from complements. Thus, Kageyama concludes that the Japanese resultative V-V compounds are formed in the lexicon for a principled reason.

#### 4.2. Compound Formation by Direct Merger

The arguments of Kageyama 1993 summarized above are quite convincing. This means that the structure in (34) cannot be maintained for (38b). But does this necessitate a radically different analysis? Here, I would like to suggest that the answer is negative.

In (34), the embedded VP is there only to express the structural relation of  $V_1$  and  $V_2$ .  $V_2$  discharges its  $\theta$ -role after it moves to a higher head. Then, for the Japanese (38b), the following alternative structure should be possible because  $V_2$  is not a complement of  $V_1$ :



Here,  $V_2$  is directly adjoined to  $V_1$  in the syntactic derivation, and the adjunction structure expresses the modification relation between the two verbs. The  $\theta$ -role assignment proceeds as before. The V-V complex raises to  $v$ , and at this point, both verbs assign their external  $\theta$ -roles to 'Taroo'.



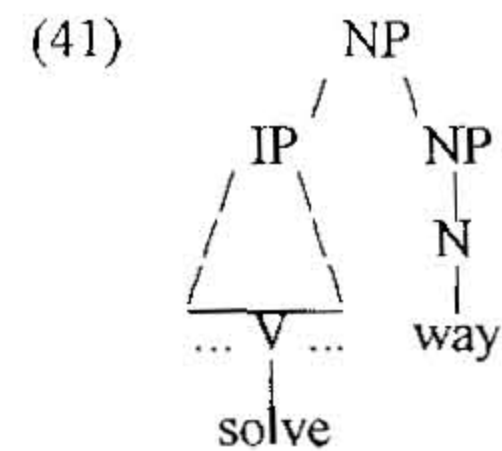
If the above analysis is correct, the Japanese resultative V-V compounds provide yet another piece of supporting evidence for the hypothesis that a head can discharge its  $\theta$ -roles from a position adjoined to another head. Further, the compound in (39) is formed in the syntax by the direct merger (adjunction) of the two heads. Then, the difference between complex predicates and lexical V-V compounds is not in whether they are formed in the syntax or in the lexicon. They are both formed in the syntax. The difference is instead in how they are formed. Complex predicates are formed by head movement, and V-V compounds are formed by direct merger.

"Word formation" by direct merger is in fact suggested in Saito and Hoshi 1998 on independent grounds. The idea is pursued further in Hoshi 1999, where the following examples are discussed:

- (40)a. John-ga [suugaku-no mondai]-o toku houhou  
 -NOM math -GEN problem-ACC solve way  
 b. John-no [suugaku-no mondai]-no toki -kata  
 -GEN math -GEN problem-GEN solve way

"the way John solves math problems"

(40a-b) express the same "meaning." (40a) is a complex NP containing a pre-nominal sentential modifier. Its rough structure is shown below in (41). (See Murasugi 1991 for discussion on the structure of Japanese complex NPs.)



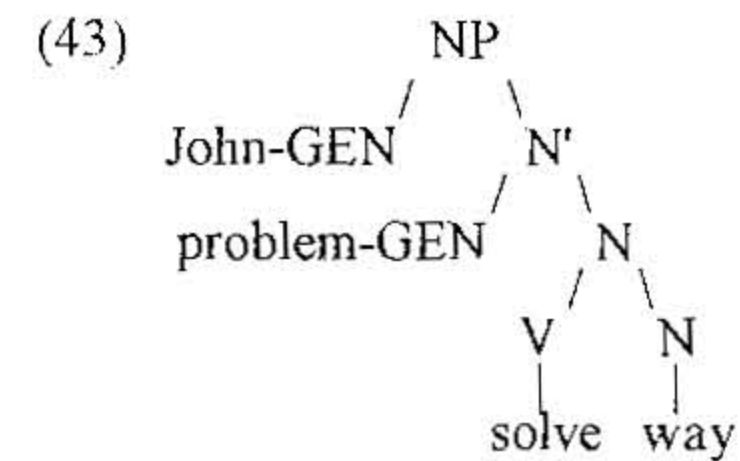
As expected, the subject and the object of the modifying clause appear in nominative and accusative respectively.

In (40b), on the other hand, 'solve' and 'way' form a word. If this word can be created by incorporation, we should expect that the Case pattern of (40b) can be the same as in (40a). However, this is not the case: both the subject and the object must be in genitive Case.

- (42) \*John-ga [suugaku-no mondai]-o toki -kata  
 -NOM math -GEN problem-ACC solve way

This is not surprising, Hoshi argues, because the modifying clause in (41) is an adjunct and head movement out of an adjunct is generally prohibited. He then

proposes the following structure for (40b):



In (43), 'solve' is directly adjoined to 'way'. This represents the modification relation. The verb 'solve' assigns its theme role and agent role to 'problem' and 'John' respectively from the adjoined position. Because the head of the compound 'solve-way' is the noun 'way', the arguments 'problem' and 'John' both appear in genitive Case.

Note that Hoshi's analysis of (40b) is virtually identical to the analysis of the Japanese resultative compounds proposed above. If it is correct, it suggests that "word-formation by direct adjunction" is quite productive in Japanese.

### 5. Phrasal Movement in English Resultatives

I have argued so far that the "syntax-semantics mismatch" in resultatives can be analyzed with head adjunction. The head adjunction structure obtains in different ways depending on the language; by covert incorporation in Edo, by overt incorporation in Chinese, and by direct merger in Japanese. The incorporation is overt in Chinese because of the morphological requirement to form compounds. Direct merger is the only option in Japanese because the language is head-final. In this section, I will argue that English resultatives involve phrasal NP-movement.

English resultatives exhibit a pattern quite similar to Edo, as illustrated in (44).

- (44)a. She painted the barn red  
 b. \*John drank (sake) drunk  
 c. The kids laughed \*(themselves) sick

(The judgements indicate the possibility of the resultative interpretation.)

As (44b-c) show, the result predicate cannot share the external argument of the cause predicate, like in the case of Edo and unlike in the case in Chinese. It appears then that English resultatives can be analyzed exactly as their Edo counterparts. The two predicates do not form a compound, and hence, the incorporation is covert. Thus, (44b), for example, can be ruled out as in (45).







that in (50), can be explained in terms of the selectional property of the verb *estimate*. This suggests that the embedded subject in (51) raises to the matrix clause and receives an internal  $\theta$ -role from the matrix verb.

When (49) and (50)-(51) are compared, a clear generalization emerges. The latter examples show that an NP can move to VP Spec and pick up an internal  $\theta$ -role. On the other hand, (49) indicates that an NP cannot move to vP Spec and receive an external  $\theta$ -role. If this generalization is indeed tenable, then the paradigm in (44) ceases to be a problem. Given the NP-movement analysis, the paradigm is just another instance of this larger generalization.

## 6. Concluding Remarks

In this paper, I have discussed the resultative constructions in Edo, Chinese, Japanese and English, and argued that they provide supporting evidence for the hypothesis that movement can create configurations of  $\theta$ -role assignment. The discussion raises a number of issues as well. On the theoretical side, if the NP-movement analysis for the English resultatives is correct, it remains to be explained why movement to vP Spec is prohibited. Also, the theoretical status of some of the devices employed in the analysis of the Japanese light verb construction and the Edo resultative SVC, e.g., covert incorporation, the classical last resort and the HMC, is far from clear. Their proper places within the theory need to be investigated.

On the empirical side, I have argued that English examples such as (47) cannot be derived by covert incorporation. But it remains to be seen whether it is an option for simpler examples like (44a). If not, it must be explained why head movement is not an option at all in English. Similarly, given the NP-movement analysis of English resultatives, a question arises whether Edo resultatives can be analyzed in a similar way. Note that the contrast between (17b) and (18), repeated below as (52a-b), suggests that the answer is negative.

- (52)a. \*Òzó sùá ògò dé \_ tòbòrè  
 Ozo push bottle fall by self  
 "Ozo pushed the bottle down by itself."  
 b. Úyì dé \_ tòbòrè  
 Uyi fall by self  
 "Uyi fell by himself."

If NP-movement is an option for Edo, then the NP-trace should license *tòbòrè* 'by self' in (52a). Then, it seems necessary to investigate why NP-movement is disallowed in Edo resultatives.

Aside from these issues, I hope I succeeded in showing that "movement for  $\theta$ -roles and  $\theta$ -role assignment" is a promising way to approach "syntax-semantics mismatches" of various types. I have argued that the Chinese resultative V-V compounds are generated by overt head movement. The covert counterpart of this head movement takes place in the Japanese light verb construction and the Edo resultative SVC. No movement is involved in the case of the Japanese lexical V-V compounds, but they provide indirect support for the head movement analysis just mentioned. And finally, phrasal movement is at least an option in English resultatives. If all this is correct, both head movement and phrasal movement can create configurations of  $\theta$ -role assignment. And more generally, I hope I succeeded in showing that resultatives provide wealth of information for the investigation of the relation between movement and  $\theta$ -role assignment.

## Notes

\* Earlier versions of this paper were presented in the 1999 syntax seminar at Nanzan University, in the East Asian Languages Workshop at National Chung-Cheng University (1999), in a colloquium at Universität Pötsdam (2000), and in the 2000 Seoul International Conference on Language and Computation. I would like to thank the audience at these places for comments and suggestions. Special thanks are due to Mark Baker for his generous help with the Edo data and their analysis. I also benefited from discussions with a number of people including Jonathan Bobaljik, Chihiro Fujimori, Hiroto Hoshi, James Huang, Taro Kageyama, Richard Larson, Jonah Lin, Sachiko Kato, Keiko Murasugi, William Snyder, and Susi Wurmbrand.

1. See Hoji 1990 and Murasugi 1991 for discussion on Japanese clefts. The NP headed by the  $\theta$ -role assigning noun cannot undergo movement of other types either. For example, it cannot be passivized as shown in (i).

(i) \*Kekkon -ga<sub>i</sub> (kyonen) Mary-niyotte John-to *t<sub>i</sub>* sareta  
 marriage-NOM last year -by -with done-was (cf. (4b))

2. The covert head movement analysis of the Edo resultative SVC will be confirmed further if the second verb resists dislocation like the  $\theta$ -role assigning noun in the Japanese light verb construction. ((9b) is the relevant example in Japanese.) Mark Baker suggests that the crucial evidence may be found with the predicate cleft construction discussed in Stewart 1998. The construction is



quite productive in Edo, but neither verb in the resultative SVC can be clefted. More research is needed to turn this suggestion into a concrete argument.

3. It is unclear whether all of these cases should be called resultatives. If the second predicate in a resultative construction, by definition, denotes a result state, then a sentence with two transitive verbs do not qualify as such. But as far as I can see, the issue is orthogonal to the concerns of this paper.

4. As in the case of Chinese, it is not clear which combinations in (31) qualify as "resultative compounds." (See footnote 3.) Also, the transitive-unergative combination is exceptional in some respects. First, the examples cannot convey a "resultative meaning" even with a stretch of imagination. Secondly, unlike in the cases of other compounds, the first verb, which is presumably the non-head, participates in Case assignment/checking, as shown in (i)-(ii).

(i)a. Taroo-ga hon -o motu  
-NOM book-ACC carry  
"Taroo carries a book."

b. Taroo-ga aruku  
-NOM walk  
"Taroo walks."

(ii) Taroo-ga hon -o moti -aruku  
-NOM book-ACC carry-walk  
"Taroo walks, carrying a book."

I suspect that this type of compounds must be treated separately, probably with some sort of conjunction (or double-headed) structure.

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