

Parsing-driven Categorization and Compound Formation: A Dynamic Perspective from a Study of Borrowing

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1. Introduction

Martin (1975), Kageyama (1993), among others, claim that Japanese has two special grammatical categories, ‘verbal nouns’ and ‘adjectival nouns.’ According to Martin (1975), ‘verbal nouns’ are predicated nouns with special verbal properties, and ‘adjectival nouns’ are predicated nouns with special adjectival properties. Significantly, most of the ‘verbal nouns’ and the ‘adjectival nouns’ are borrowed from Chinese, and some are taken from English, or are of native origin.

On the other hand, through a study of light verb constructions in Japanese, Grimshaw and Mester (1988) demonstrate that Japanese ‘verbal nouns’ display the mixed [+V/+N] properties. Furthermore, Grimshaw and Mester (1988) propose an account for the dual characteristics of ‘verbal nouns’ in terms of complex predicate formation, ‘Argument Transfer,’ in the lexicon. Contrary to Grimshaw and Mester (1988), Saito and Hoshi (2000) argue that we should explain the mixed [+V/+N] characteristics of ‘verbal nouns’ in terms of complex predicate formation not in the lexicon, but in the core computation. More specifically, Saito and Hoshi (2000) propose an LF incorporation analysis of Japanese light verb constructions, and suggest that if the head movement analysis is correct, it implies that predicates such as ‘verbal nouns’ may assign theta roles in the course of the derivation even after movement operations (contra. Baker 1988, Chomsky’s 1995 configurational theta theory; cf. Bošković and Takahashi 1998, Hornstein 1999).

In this paper, as in Hoshi (in press, 2013), I regard it as nontrivial that most of the ‘verbal nouns’ in Japanese are borrowing (Martin 1975, Kageyama 1993, among others). Furthermore, following Martin (1975), Kageyama (1993), Ito and Sugioka (2002), Sugioka (2009), among others, I consider a ‘verbal noun’ as a special grammatical category in Japanese (contra. Grimshaw and Mester’s (1988) and Saito and Hoshi’s (2000) view that a ‘verbal noun’ is simply N with its own argument structure; contra. also Hoshi (1994, etc.)). Based on these, here, I try to provide further evidence for Hoshi’s (in press, 2013) proposal that a verbal noun is a special grammatical category in Japanese in that the categorial status of a ‘verbal noun’ is not specified with respect to V or N in the lexicon. Hence, the categorial status of the projection of a ‘verbal noun’ must be determined by Case and/or Tense in accordance with structural context step by step in the left to right incremental processing of a sequence of words (cf. Kempson et al. 2001, Cann et al. 2005, Cann et al. 2009, Kempson and Kiaer 2009, Kempson and Kurosawa 2009, etc.; cf. Phillips 1996). Consequently, here, I attempt to reinforce the hypothesis that the Japanese language might have accommodated borrowing such as ‘verbal nouns’ by making the optimal use of the underspecification of lexical information and its own grammatical resources such as case and tense markers.¹

In the following section, I show some of the major properties of ‘verbal nouns.’ In Section 3, based on Hoshi (in press, 2013), I argue for a processing-based analysis of ‘verbal nouns’ which makes crucial use of the underspecification of verbal nouns, and case and/or tense markers. In Section 4, I attempt to suggest that there might be a possibility that the proposed parsing-driven categorization allows a ‘verbal noun’ to undergo compound formation in the course of the left to right incremental processing of a sequence of words. This is so, because the

fixed categorial information seems to be a prerequisite for compound formation, and the categorial status of a ‘verbal noun’ is determined only in the parsing process. Consequently, I suggest that it might be the case that ‘postsyntactic compounds,’ which are discovered by Shitabani and Kageyama (1988) and appear to be unique to Japanese, are indeed formed in the parsing process, not in PF or at S-structure (cf. Kageyama and Shibatani 1989, Kageyama 1993, etc.) Section 5 concludes the discussion of this paper with some general remarks on borrowing, underspecification, and the dynamics of language (cf. Kempson et al. 2001, Cann et al. 2005, Cann et al. 2009, Kempson and Kiaer 2009, Kempson and Kurosawa 2009, etc.; cf. Phillips 1996).

2. Verbal Nouns

On the basis of a detailed examination of light verb constructions in Japanese, Grimshaw and Mester (1988) show the following mixed [+V/+N] properties of verbal nouns. Consider example (1) first.

- (1) John-**no** Mary-**kara-no** hooseki-**no** **ryakudatu-ga**
 John-Gen Mary-from-Gen jewelry-Gen plundering-Nom
 ‘John’s stealing of jewelry from Mary’

In (1), the verbal noun *ryakudatu* ‘plundering,’ which is of Chinese origin, is used. Here, the verbal noun *ryakudatu* seems to be N, because the agent argument *John* is suffixed with the Genitive Case marker *-no*. The source argument *Mary-kara* is also suffixed with the Genitive Case marker. The theme argument *hooseki* ‘jewelry’ is suffixed with *-no*, too.

Examine next example (2), which is an instance of Japanese light verb construction. The verb *si* ‘do’ in (2) is the light verb in Japanese, which lacks semantic content. As shown below, the verbal noun is suffixed with the light verb *si* in (2).

- (2) John-**ga** Mary-**kara** hooseki-**o** **ryakudatu-si-ta**.
 John-Nom Mary-from jewelry-Acc plundering-do-Pst
 ‘John stole jewelry from Mary.’

Here, the verbal noun *ryakudatu* seems to be V. This is because the agent *John* is suffixed with the Nominative Case marker *-ga*; the source *Mary-kara* appears without any case particle; the theme *hooseki* is suffixed with the Accusative Case marker *-o*.

Consider now another type of light verb construction in (3). Unlike in (2), the verbal noun *ryakudatu* is suffixed with the Accusative Case marker *-o* in (3).

- (3) ?John-**ga** Mary-**kara** hooseki-**o** **ryakudatu-o** si-ta.
 John-Nom Mary-from jewelry-Acc plundering-Acc do-Pst
 ‘John stole jewelry from Mary’

In (3) as well, the verbal noun appears to be V. This is because in (3), the agent is suffixed with *-ga*; the source shows up without any case particle; the theme is suffixed with *-o*, exactly as in (2).

Examine next another type of light verb construction in Japanese in (4).

- (4) John-**ga** Mary-**kara** hooseki-**no** **ryakudatu-o** si-ta.
 John-Nom Mary-from jewelry-Gen plundering-Acc do-Pst

‘John stole jewelry from Mary.’

Importantly, here, the verbal noun *ryakudatu* seems to be V and N at the same time. In (4), the agent is suffixed with the Nominative Case particle *-ga*, and the source appears without any case particle. This Case information implies *ryakudatu* is V (see 2 and 3). However, the theme *hoseki* is suffixed with the Genitive Case particle *-no*, suggesting that the verbal noun is N (see 1; cf. 2 and 3).

Grimshaw and Mester (1988) discover that the verbal noun *ryakudatu* in (5) also displays the dual [+V/+N] characteristics, but that (5) contrasts with (4) in its grammaticality.

- (5) *John-**ga** hoseki-**o** Mary-**kara-no** **ryakudatu**-o si-ta.
 John-Nom jewelry-Acc Mary-from-Gen plundering-Acc do-Pst
 ‘John stole jewelry from Mary.’

This is so, because in (5), the agent *John* is suffixed with the Nominative Case marker *-ga* and the theme *hoseki* is suffixed with the Accusative Case marker *-o* (see 2 and 3). This suggests that *ryakudatu* is V. On the other hand, the source *Mary-kara* is suffixed with the Genitive Case marker *-no*, implying that the verbal noun is N (see 1). However, (5) is ungrammatical in sharp contrast with (4).²

Shibatani and Kageyama (1988), on the other hand, present further significant data like the one in (6) to reveal the nature of verbal nouns in Japanese.

- (6) Kanai -**ga** Amerika-**o** **hoomon**-no ori -ni -wa, iroiro
 my wife-Nom America-Acc visiting-Gen occasion-on-Top much
 osewa -ni narimasi -ta.
 hospitality-Adv.Part. she.receive-Pst
 ‘Thank you for your generous hospitality when my wife visited America.’

In (6), the verbal noun *hoomon* ‘visiting,’ which is also Sino-Japanese, is used. In this construction, the verbal noun is suffixed with the Genitive Case particle *-no* which is licensed by the time denoting noun *ori* ‘occasion.’ In this structural configuration, *hoomon* in (6) appears to be V, because the agent argument *kanai* ‘my wife’ is suffixed with the Nominative Case marker *-ga*, and the locative argument *Amerika* ‘America’ is suffixed with the Accusative Case particle *-o*.

Furthermore, Miyagawa (1991) and others observe that the construction like (6) displays ‘mixed case’ arrays, like light verb constructions such as (2), (3) and (4). Examine now the following data:

- (7)a. John-**no** Mary-**kara-no** hoseki-**no** **ryakudatu**-no ori -ni, ...
 John-Gen Mary-from-Gen jewelry-Gen plundering-Gen occasion-on, ...
 ‘When John stole jewelry from Mary, ...’ (cf. 1)
- b. John-**ga** Mary-**kara-no** hoseki-**no** **ryakudatu**-no ori -ni, ...
 John-Nom Mary-from-Gen jewelry-Gen plundering-Gen occasion-on, ...
- c. John-**ga** Mary-**kara** hoseki-**no** **ryakudatu**-no ori -ni, ...
 John-Nom Mary-from jewelry-Gen plundering-Gen occasion-on, ... (cf. 4)

- d. John-**ga** Mary-**kara** hooseki-**o** ryakudatu-no ori -ni, ...
 John-Nom Mary-from jewelry-Acc plundering-Gen occasion-on, ... (cf. 2&3)

In (7a), the verbal noun *ryakudatu* appears to be N, because the agent *John* is suffixed with the Genitive Case particle *-no*; the source *Mary-kara* is also suffixed with the Genitive Case marker; the theme *hooseki* ‘jewelry’ is suffixed with *-no* as well (cf. 1). In (7b), *ryakudatu* seems to be V and N at the same time. This is because the agent argument *John* is suffixed with the Nominative Case marker *-ga*, implying that the verbal noun is V. However, both the source argument *Mary-kara* and the theme are suffixed with the Genitive Case marker, suggesting that *ryakudatu* is N. In (7c) as well, the verbal noun appears to be V and N at the same time. This is so, because the agent is suffixed with *-ga*, and the source appears without any case particle, implying that *ryakudatu* is V. On the other hand, the theme is suffixed with the Genitive Case marker *-no*, suggesting that the verbal noun is N (cf. 4). In (7d), the verbal noun *ryakudatu* appears to be V, because none of its arguments is suffixed with the Genitive Case marker *-no* (cf. 2 and 3). The agent *John* is suffixed with the Nominative Case marker *-ga*. The source argument *Mary-kara* appears without any case particle. The theme argument *hooseki* is suffixed with the Accusative Case marker *-o*.

As is well-known, Grimshaw and Mester (1988) attempt to account for the nature of Japanese light verb constructions such as (2-5) in terms of complex predication formation, Argument Transfer, in the lexicon. Saito and Hoshi (2000), on the other hand, try to explain the properties of light verb constructions in terms of syntactic complex predicate formation, i.e. head movement. In other words, to account for the dual [+V/+N] characteristics of a verbal noun, both of these two approaches assume that a verbal noun, which is supposed to be inherently N with its own argument structure, undergoes complex predicate formation with the light verb *si*. Notice, however, that examples such as (6) and (7a-d) contain a verbal noun, but crucially lack the light verb *si*. It is thus not entirely clear if we can apply directly to constructions such as (6) and (7a-d), these types of analysis in terms of complex predicate formation of a verbal noun and the light verb *si*. Given the data like (6) and (7a-d), however, there in fact arises a possibility that the light verb *si* has nothing to do with the mixed [+V/+N] characteristics of a verbal noun in Japanese. In the following section, I argue that this is indeed the case, based on Hoshi (in press, 2013) (contra. Hoshi 1994, etc.)

3. Parsing-driven Categorization of Verbal Nouns

As I mentioned above, both Grimshaw and Mester (1988) and Saito and Hoshi (2000) adopt a ‘static/non-dynamic’ view of a lexical item, where the categorial status of a verbal noun in Japanese is fixed as N in the lexicon. Contrary to this fixed view of words, as in Hoshi (in press, 2013), I adopt a ‘dynamic’ view of a lexical item here, where the nature of a lexical item is very often not fully fixed in the lexicon, and thus, that of a lexical item must be updated and determined step by step in the left to right incremental processing of a sequence of words (Kempson et al. 2001, Cann et al. 2005, Cann et al. 2009, among others; cf. Sperber and Wilson 1995). Namely, to account for the mixed [+V/+N] properties of verbal nouns in Japanese, I suggest assumptions (8) and (9a-b). ((8) and (9a-b) are proposed by Hoshi (in press, 2013), and (9b) is slightly revised here.)

Consider first assumption (8).

- (8) The categorial status of ‘verbal nouns’ in Japanese is not specified with respect to N or V in the lexicon, and thus, that of ‘verbal nouns’ must be determined by structural environments/context in the course of the left to right incremental processing.

Assumption (8) implies that a verbal noun, being one type of borrowing in Japanese, is a unique grammatical category in that the categorial status of a verbal noun is not fixed concerning V or N in the lexicon. Accordingly, under the dynamic view of words, the categorial status of the projection of a verbal noun must be updated and

fixed in accordance with structural environments/context step by step in the course of the left to right incremental processing of a sequence of words.

Consider now assumptions (9a) and (9b).

- (9)a. At the time when a case marker (henceforth, K) merges a projection of a ‘verbal noun’ in the course of the left to right incremental processing, the projection of the ‘verbal noun’ merged by K is licensed as an N projection.
- b. At the time when a tense marker (henceforth, T) c-commands a projection of a ‘verbal noun’ in the course of the left to right incremental processing, the projection of the ‘verbal noun’ c-commanded by T is licensed as a V projection.

Assumptions (9a) and (9b) are suggested in line with the claim that case and tense markers play significant roles in the left to right processing of a sequence of words in Japanese (Kempson et al. 2001, Cann et al. 2005, Cann et al. 2009, Kempson and Kiaer 2009, Kempson and Kurosawa 2009, among others). According to (9a), once the projection of a verbal noun is morphologically merged by a case marker, the underspecified projection is licensed as an N projection. According to (9b), once the projection of a verbal noun is c-commanded by a tense marker, the underspecified projection is licensed as a V projection. These assumptions seem to me to have some plausibility, because case markers morphologically ‘c-select’ a [+N] category, and tense markers ‘determine the tense value’ of a [+V] projection in Japanese. Below, I aim to show that the dynamics of language together with assumptions (8) and (9a-b) enables us to account for the dual [+V]/[+N] characteristics of verbal nouns in Japanese naturally in a novel way (cf. Grimshaw and Mester 1988, Hoshi 1994, Saito and Hoshi 2000, among others.).

Consider first example (1), repeated here as (10).

- (10) [John-**no** Mary-kara-**no** hooseki-**no** ryakudatu] -ga (=1)

Under the proposed parsing-based analysis, the language faculty parses the words in (10) as follows:

- (11)a. [_{2N} John-**no** [_{2N} Mary-kara-**no** [_{2N} hooseki-**no** [_{2V/2N} ryakudatu]]]] ==>
- b. [_{NP} John-**no** [_N Mary-kara-**no** [_N hooseki-**no** [_N ryakudatu]]]]- [_K ga]

As illustrated in (11a), *John-no*, *Mary-kara-no*, and *hooseki-no* are parsed step by step in the left to right incremental processing. Because *John*, *Mary-kara*, and *hooseki* are all suffixed with the Genitive Case marker [_K *no*], the language faculty predicts the projections immediately dominating these words are N projections. Then, the verbal noun *ryakudatu* is parsed, and introduced to the parsed structure as an categorially underspecified lexical item due to assumption (8). Hence, in (11a), all the projections are candidates for an N projection. Finally, as shown in (11b), the Nominative Case marker [_K *ga*] is parsed, and the Nominative Case marker [_K *ga*] attaches to the highest underspecified projection of *ryakudatu*, licensing it as a whole as an N projection due to assumption (9a), as desired.

Consider next example (2), repeated here as (12).

- (12) John-**ga** Mary-**kara** hooseki-**o** ryakudatu-si-ta. (=2)

The language faculty parses a string of words in (12) in the following way:

- (13)a. [_{2V} John-ga [_{2V} Mary-kara [_{2V} hooseki-o [_{2V/?N} ryakudatu]]]] ==>
- b. [_{VP} [_{2V} John-ga [_{2V} Mary-kara [_{2V} hooseki-o [_{2V/?N} ryakudatu]]]] [_V si]] ==>
- c. [_{TP} [_{VP} [_{VP} John-ga [_V Mary-kara [_V hooseki-o [_V ryakudatu]]]] [_V si]] [_T ta]]

In (12), *John* is suffixed with the Nominative Case marker [_K ga]; *Mary-kara* is not suffixed with any case particle; *hooseki* is suffixed with the Accusative Case marker [_K o]. Hence, as shown in (13a), the projections immediately dominating these arguments are predicted to be V projections. Then, as in (13a), the verbal noun *ryakudatu* is parsed and introduced to the parsed structure as a categorially underspecified word due to assumption (8). As in (13b), then, the light verb [_V si] is parsed, and introduced to the parsed tree. Finally, as illustrated in (13c), the past tense marker [_T ta] is parsed, and c-commands and takes a semantic scope over the entire underspecified projection of the verbal noun *ryakudatu*, licensing it as a V projection due to assumption (9b), as desired.

As a desirable consequence, the proposed processing-based analysis based on (8) and (9a-b) provides a straightforward way to account for the ungrammaticality of examples like the one in (14), discovered by Miyagawa (1991), Kageyama (1993), Dubinsky (1997), among others.

- (14) *John-ga Mary-kara hooseki-no ryakudatu-si-ta.
 John-Nom Mary-from jewelry-Gen plundering-do-Pst
 ‘John stole jewelry from Mary.’

Consider the left to right parsing process of the words in (14) below:

- (15)a. [_{2V} John-ga [_{2V} Mary-kara [_{2N} hooseki-no [_{2V/?N} ryakudatu]]]] ==>
- b. [_{VP} [_{2V} John-ga [_{2V} Mary-kara [_{2N} hooseki-no [_{2V/?N} ryakudatu]]]] [_V si]] ==>
- c. *[[_{TP} [_{VP} [_{VP} John-ga [_V Mary-kara [_V hooseki-no [_V ryakudatu]]]] [_V si]] [_T ta]]

In example (14), *John* is suffixed with the Nominative Case marker, and *Mary-kara* is not suffixed with any case particle. However, *hooseki* ‘jewelry’ is suffixed with the Genitive Case marker [_K no]. Hence, as illustrated in (15a), the language faculty anticipates the projections immediately dominating *John-ga* and *Mary-kara* to be V projections, and the projection immediately dominating *hooseki-no* to be an N projection. Then, the verbal noun *ryakudatu* is introduced to the parsed tree underspecified, due to assumption (8). As in (15b), then, the light verb [_V si] is parsed, and introduced to the tree structure. Finally, as shown in (15c), the past tense marker [_T ta] is parsed, and c-commands the whole underspecified projection of *ryakudatu*, licensing it as a V projection due to (9b) and taking its semantic scope. Consequently, the Genitive Case-marked theme argument *hooseki-no* is forced to be immediately dominated by a V projection, and fails to have its Case feature checked off, as desired (cf. Grimshaw and Mester 1988, Hoshi 1994, Saito and Hoshi 2000, etc.)³

Consider next example (3), repeated here as (16). (16) sounds slightly odd. This is presumably because it is in violation of the surface double-*o* constraint, which prohibits more than one *-o* marked NP within a single sentence (Harada 1973, Kuroda 1978, Saito 1985, among others).

(16) ?John-ga Mary-kara hooseki-o ryakudatu-o si-ta. (=3)

The language faculty parses a sequence of words given in (16) as follows:

- (17)a. [_{2V} John-ga [_{2V} Mary-kara [_{2V} hooseki-o [_{2V/2N} ryakudatu]]]] ==>
- b. [_{2V} John-ga [_{2V} Mary-kara [_{2V} hooseki-o [_N ryakudatu]-[_K o]]]] ==>
- c. [_{VP} [_{2V} John-ga [_{2V} Mary-kara [_{2V} hooseki-o [_N ryakudatu]-[_K o]]]] [_V si]] ==>
- d. [_{TP} [_{VP} [_{VP} John-ga [_V Mary-kara [_V hooseki-o [_N ryakudatu]-[_K o]]]] [_V si]] [_T ta]]

In (16), *John* is suffixed with [_K ga]; *Mary-kara* is not suffixed with any case particle; *hooseki* is suffixed with [_K o]. Namely, none of these arguments is suffixed with the Genitive Case marker [_K no]. Hence, as illustrated in (17a), the language faculty predicts that all these arguments should be immediately dominated by a V projection. Then, the verbal noun *ryakudatu* is parsed, and introduced to the parsed tree underspecified, due to assumption (8). In parsed structure (17a), only the lowest projection of the verbal noun *ryakudatu* thus turns out to be a candidate for an N projection. Hence, as shown in (17b), after the Accusative Case marker [_K o] is parsed, [_K o] morphologically merges the lowest projection of the verbal noun, licensing it as an N projection due to assumption (9a). Then, as in (17c), the light verb [_V si] is parsed, and [_V si], as a transitive verb, licenses the Accusative Case marker [_K o] attached to the lowest projection of the verbal noun *ryakudatu*. Finally, as illustrated in (17d), the past tense marker [_T ta] is parsed, and c-commands the entire projection of the verbal noun, subsequently licensing the remaining underspecified projection as a V projection due to (9b). Notice here that case markers are allowed to merge with any potential [+N] projection of a verbal noun, whereas tense markers must c-command the whole projection of a verbal noun (see 17b vs. 17d; see also 13c and 15c). This is a direct consequence of the assumption that case markers such as [_K o] do not take semantic scope in sharp contrast with tense markers. Namely, due to their semantic content, tense markers must take a semantic scope properly in the parsed tree. Case markers, on the other hand, may attach to any [+N] category for formal reasons, because they do not take semantic scope, and after carrying out all the formal operations such as Case feature checking, case markers disappear from the parsed tree.

Examine now example (4), repeated here as (18).

(18) John-ga Mary-kara hooseki-no ryakudatu-o si-ta. (=4)

Under the proposed processing-based analysis, the language faculty parses the words in (18) as follows:

- (19)a. [_{2V} John-ga [_{2V} Mary-kara [_{2N} hooseki-no [_{2V/2N} ryakudatu]]]] ==>
- b. [_{2V} John-ga [_{2V} Mary-kara [_{NP} hooseki-no [_N ryakudatu]-[_K o]]]] ==>
- c. [_{VP} [_{2V} John-ga [_{2V} Mary-kara [_{NP} hooseki-no [_N ryakudatu]-[_K o]]]] [_V si]] ==>
- d. [_{TP} [_{VP} [_{VP} John-ga [_V Mary-kara [_{NP} hooseki-no [_N ryakudatu]-[_K o]]]] [_V si]] [_T ta]]

In (18), the agent *John* is suffixed with the Nominative Case marker [_K ga] and the source *Mary-kara* is not suffixed

with any case particle. On the other hand, *hoseki* is suffixed with the Genitive Case marker [_K *no*]. Hence, as illustrated in (19a), the language faculty predicts the projections immediately dominating *John-ga* and *Mary-kara* should be V projections. *Hoseki-no* is, however, predicted to be immediately dominated by an N projection. Then, after the verbal noun *ryakudatu* is parsed, it is introduced to the parsed tree underspecified due to assumption (8a). Consequently, in (19a), both the second lowest and the lowest projections of the verbal noun turn out to be potential N projections. Hence, as shown in (19b), after the Accusative Case marker [_K *o*] is parsed, [_K *o*] morphologically attaches to the second lowest projection of *ryakudatu*, licensing it as an N projection due to assumption (9a). Then, as in (19c), the light verb [_V *si*] is parsed, and the light verb licenses the Accusative Case marker [_K *o*] attached to the second lowest projection of the verbal noun. Finally, as illustrated in (19d), the past tense marker [_T *ta*] is parsed, and c-commands the entire projection of the verbal noun, licensing the remaining underspecified projection of *ryakudatu* as a V projection due to assumption (9b). As we can see in (17b) and (19b), the Accusative Case marker [_K *o*] is allowed to merge any potential [+N] projection in contrast with the past tense marker [_T *ta*]. This is because tense markers have significant semantic content, taking their semantic scopes, whereas case markers such as [_K *o*] do not have such semantic content.

Importantly, the proposed parsing processes in (17a-d) and (19a-d) provide us with a direct way to explain the nature of predicate fronting data like (20a-b), discovered by Sato (1993) and others.

- (20)a. (?) [*Mary-kara hoseki-o ryakudatu*]-o -(sae), John-ga si-ta.
 Mary-from jewelry-Acc plundering -Acc-(even), John-Nom do-Pst
 ‘Even steal jewelry from Mary, John did.’ (see 17a-d for 16)
- b. [*Mary-kara hoseki-no ryakudatu*]-o, John-ga si-ta.
 Mary-from jewelry-Gen plundering -Acc, John-Nom do-Pst
 ‘Steal jewelry from Mary, John did.’ (see 19a-d for 18)

That is, the predicate fronting in (20a) implies that [*Mary-kara hoseki-o ryakudatu*]-o forms a constituent in (16), and that the predicate fronting in (20b) suggests that [*Mary-kara hoseki-no ryakudatu*]-o is a constituent in (18). Notice that under the proposed analysis based on assumptions (8) and (9a-b), [*Mary-kara hoseki-o ryakudatu*]-o is indeed a constituent in (17a-d), and [*Mary-kara hoseki-no ryakudatu*]-o does also form a constituent in (19a-d), as desired (cf. Grimshaw and Mester 1988, Hoshi 1994, Saito and Hoshi 2000, etc.)⁴

The proposed analysis based on assumptions (8) and (9a-b) also accounts for the data like the one in (5), discovered by Grimshaw and Mester (1988) and Grimshaw (1990). (5) is repeated here as (21).

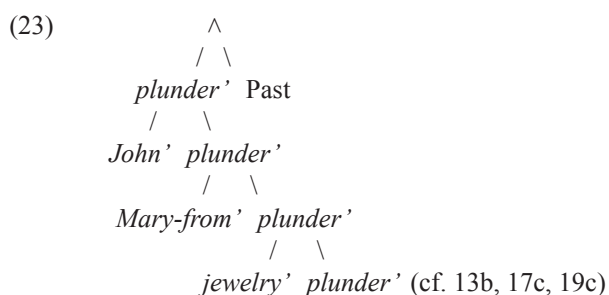
- (21) *John-ga hoseki-o Mary-kara-no ryakudatu-o si-ta. (=5)

The language faculty parses the words in (21) as follows:

- (22)a. *_[2V] John-ga _[2V] hoseki-o _[2N] Mary-kara-no _[2V/2N] ryakudatu]]] (cf. 19a)====>
- b. *_[2V] John-ga _[2V] hoseki-o _[NP] Mary-kara-no _[N] ryakudatu]]-_{[K o]]] (cf. 19b)====>}
- c. *_[VP] _[2V] John-ga _[2V] hoseki-o _[NP] Mary-kara-no _[N] ryakudatu]]-_{[K o]]] _{[V si]] (cf. 19c)====>}}
- d. *_[TP] _[VP] _[VP] John-ga _[V] hoseki-o _[NP] Mary-kara-no _[N] ryakudatu]]-_{[K o]]] _{[V si]] _{[T ta]]] (cf. 19d)}}}

In (21), the agent *John* is suffixed with the Nominative Case marker [_K *ga*], and the theme argument *hooseki* is suffixed with the Accusative Case marker [_K *o*]. However, the source argument *Mary-kara* is suffixed with the Genitive Case marker [_K *no*]. Hence, as illustrated in (22a), the language faculty anticipates the projections immediately dominating *John-ga* and *hooseki-o* to be V projections. The language faculty, on the other hand, predicts the projection immediately dominating *Mary-kara-no* to be an N projection. Then, the verbal noun *ryakudatu* is parsed, and introduced to the parsed tree underspecified due to assumption (8). As shown in (22a), both the second lowest and the lowest projections of the verbal noun *ryakudatu* are potential [+N] projections. Hence, as shown in (22b), after the Accusative Case marker [_K *o*] is parsed, the Accusative Case marker merges with the second lowest projection of the verbal noun, licensing it as an N projection due to (9a). As in (22c), after the light verb [_V *si*] is parsed, it is introduced to the parsed structure, licensing [_K *o*] attached to the second lowest projection of *ryakudatu*. Finally, as in (22d), the past tense marker [_T *ta*] merges the whole structure constructed in (22c), licensing the remaining underspecified projection of the verbal noun as a V projection due to assumption (9b). What is problematic about (22a-d) in contrast with (19a-d), however, is that in (19a-d), the theme argument *hooseki* ‘jewelry’ is placed in the closest complement position of the verbal noun, whereas in (22a-d), the source argument *Mary-kara* ‘from Mary’ is positioned in the closest complement position of *ryakudatu*, violating a condition imposed by Chomsky’s (1995) configurational theta theory.

Significantly, the proposed processing-based analysis of verbal nouns also provides us with a direct way to account for the semantic equivalence among various types of light verb construction in Japanese. This is so because if we eliminate formal features such as case features from the parsed representations such as (13c), (17d), or (19d), we come up with the configurationally identical structure (23), which enables us to capture uniformly the semantic equivalence among all these light verb constructions in (12), (16) and (18), as desired.



On the other hand, under Grimshaw and Mester’s (1988) Argument Transfer analysis or Saito and Hoshi’s (2000) LF incorporation analysis, various types of light verb constructions are given distinct LF representations. Hence, it is not entirely clear how these approaches capture the semantic equivalence among a variety of light verb constructions based on their LF representations (cf. Kuroda 2003).⁵

Importantly, unlike Grimshaw and Mester’s (1988) Argument Transfer Analysis or Saito and Hoshi’s (2000) LF incorporation analysis, the proposed parsing-based analysis also accounts for the nature of Shitabani and Kageyama’s (1988) example in (6), repeated here as (24), in a straightforward manner.

(24) Kanai-**ga** Amerika-**o** **hoomon-no ori** -ni -wa, iroiro osewa -ni narimasi -ta. (=6)

This is so, because the presence or the absence of the light verb [_V *si*] does not matter at all for the proposed parsing-based analysis to account for the nature of a verbal noun in Japanese.

In (24), *kanai* ‘my wife’ is suffixed with the Nominative Case marker [_K *ga*] and the locative argument *Amerika* ‘America’ is suffixed with the Accusative Case marker [_K *o*]. Thus, as shown in (25a), under the proposed analysis,

- (25)a. [_{VP} Kanai-ga [_{VP} Amerika-o [_{VP/N} hoomon]]] ==>
- b. [_{VP} Kanai-ga [_{VP} Amerika-o [_N hoomon]-[_K no]]] ==>
- c. [_{TP/NP} [_{VP} Kanai-ga [_V Amerika-o [_N hoomon]-[_K no]]] [_{T/N} ori]] ...

the language faculty predicts both *kanai-ga* and *Amerika-o* should be immediately dominated by a V projection. Then, the verbal noun *hoomon* ‘visiting,’ which is also of Chinese origin, is parsed, and is introduced to the parsed structure underspecified due to assumption (8). Consequently, in (25a), the lowest projection of the verbal noun *hoomon* turns out to be the only potential [+N] category. Thus, as illustrated in (25b), after the Genitive Case marker [_K no] is parsed, [_K no] morphologically attaches to the lowest projection of *hoomon*, licensing it as an N projection due to assumption (9a). Finally, as in (25c), the time denoting noun [_{T/N} ori] ‘occasion’ is parsed, and c-commands the whole projection of the verbal noun, licensing the remaining underspecified projection as a V projection due to assumption (9b). Furthermore, as a noun, [_{T/N} ori] licenses the Genitive Case marker [_K no] attached to the lowest projection of *hoomon*.

Similarly, the proposed analysis based on assumptions (8) and (9a-b) explains the grammaticality of Miyagawa’s (1991) examples like (7a-d), repeated here as (26a-d), as desired.

- (26)a. John-no Mary-kara-no hooseki-no ryakudatu-no ori -ni, ...
John-Gen Mary-from-Gen jewelry-Gen plundering-Gen occasion-on, (cf. 1)
- b. John-ga Mary-kara-no hooseki-no ryakudatu-no ori -ni, ...
John-Nom Mary-from-Gen jewelry-Gen plundering-Gen occasion-on, ...
- c. John-ga Mary-kara hooseki-no ryakudatu-no ori -ni, ...
John-Nom Mary-from jewelry-Gen plundering-Gen occasion-on, ... (cf. 4)
- d. John-ga Mary-kara hooseki-o ryakudatu-no ori -ni, ...
John-Nom Mary-from jewelry-Acc plundering-Gen occasion-on, ... (cf. 3)

Here as well, the examples in (26) lack the light verb [_V si].

The proposed processing-based analysis assigns parsed structures (27a-d) to examples (26a-d), respectively.

- (27)a. [_{TP/NP} [_{NP} John-no [_N Mary-kara-no [_N hooseki-no [_N ryakudatu]]]-[_K no] [_{T/N} ori]]-ni (for 26a; cf. 11a-b)
- b. [_{TP/NP} [_{VP} John-ga [_{NP} Mary-kara-no [_N hooseki-no [_N ryakudatu]]]-[_K no] [_{T/N} ori]]-ni (for 26b)
- c. [_{TP/NP} [_{VP} John-ga [_V Mary-kara [_{NP} hooseki-no [_N ryakudatu]]]-[_K no]] [_{T/N} ori]]-ni (for 26c; cf. 19a-d)
- d. [_{TP/NP} [_{VP} John-ga [_V Mary-kara [_V hooseki-o [_N ryakudatu]]-[_K no]]] [_{T/N} ori]]-ni (for 26d; cf. 17a-d)

In (26a), *John*, *Mary-kara*, and *hooseki* are all suffixed with the Genitive Case marker [_K no]. Hence, the language faculty predicts the projections immediately dominating these arguments to be N projections. As shown in (27a), the Genitive Case marker [_K no] is thus merged with the highest projection of the verbal noun *ryakudatu*,

licensing the whole underspecified projection as an N projection due to assumption (9a). Then, the time denoting noun $[_{TN} ori]$ merges and c-commands the highest projection of *ryakudatu*, licensing, as a noun, the Genitive Case marker $[_K no]$ attached to the entire projection of the verbal noun.

In (26b), *John* is suffixed with the Nominative Case marker $[_K ga]$. *Mary-kara* and *hooseki* are both suffixed with the Genitive Case marker $[_K no]$. Hence, the language faculty anticipates *John-ga* to be immediately dominated by a V projection, and *Mary-kara-no* and *hooseki-no* to be immediately dominated by an N projection. As illustrated in (27b), the Genitive Case marker $[_K no]$ is thus attached to the second highest projection of the verbal noun, licensing the underspecified projection of *ryakudatu* as an N projection due to (9a). Then, the time denoting nominal $[_{TN} ori]$ merges the highest projection of *ryakudatu*, licensing the remaining underspecified projection as a V projection due to assumption (9b). Furthermore, $[_{TN} ori]$, as a noun, checks off the Genitive Case feature $[_K no]$ attached to the second highest projection of the verbal noun.

In (26c), *John* is suffixed with the Nominative Case marker $[_K ga]$, and the source argument *Mary-kara* appears without any case particle. The theme *hooseki*, on the other hand, is suffixed with the Genitive Case marker $[_K no]$. Hence, as seen in (27c), the language faculty predicts that *John-ga* and *Mary-kara* are immediately dominated by a V projection, whereas *hooseki-no* is immediately dominated by an N projection. The Genitive Case marker $[_K no]$ is thus attached to the second lowest projection of the verbal noun *ryakudatu*, licensing it as an N projection due to assumption (9a). Finally, the time denoting noun $[_{TN} ori]$ is parsed and c-commands the highest projection of *ryakudatu*, licensing the remaining underspecified projection of the verbal noun as a V projection due to assumption (9b). Then, as a noun, the time denoting noun $[_{TN} ori]$ licenses the Genitive Case $[_K no]$ attached to the second lowest projection of *ryakudatu*.

In (26d), *John* is suffixed with the Nominative Case marker $[_K ga]$. The source *Mary-kara* shows up without any case particle. The theme argument *hooseki* is suffixed with the Accusative Case marker $[_K o]$. Hence, the language faculty anticipates the projections immediately dominating these arguments should be V projections. Hence, in (26d), the verbal noun *ryakudatu* is the only potential $[+N]$ category, due to assumption (8). As illustrated in (27d), the Genitive Case marker $[_K no]$ is thus attached to the lowest projection of *ryakudatu*, licensing it as an N projection due to assumption (9a). Then, the time denoting noun $[_{TN} ori]$ is parsed, and c-commands the entire projection of the verbal noun, licensing the remaining underspecified projection as a V projection due to assumption (9b), as desired. As a noun, $[_{TN} ori]$ also licenses the Genitive Case maker $[_K no]$ attached to the lowest projection of the verbal noun.

Notice here as well that the time denoting noun $[_{TN} ori]$ ‘occasion’ always merges the highest projection of the verbal noun *ryakudatu*, whereas the Genitive Case marker $[_K no]$ may merge with any $[+N]$ category for formal reasons (see 27a-d). This is because $[_{TN} ori]$ must take its own semantic scope, due to its semantic content, while the Genitive Case marker $[_K no]$, due to its semantic content, may merge any potential $[+N]$ projection of the verbal noun *ryakudatu* (cf. the Accusative Case marker $[_K o]$).

Consider now the data in (28a-b). As shown below, the nominal suffix *-kata* ‘way’ in Japanese morphologically selects V^0 (Kageyama 1993, Ito and Sugioka 2002, among others.)

- | | |
|---|--|
| (28)a. $[_V \text{tabe}]$ -kata
eat –way
‘how to eat’ | b. $[_V [_V \text{tabe}]]$ -kata
eat - make -way
‘how to make someone eat’ |
|---|--|

In (28a), $[_N \text{kata}]$ is attached to the verb $[_V \text{tabe}]$ ‘eat.’ In (28b), the nominal suffix is morphologically attached to the complex causative verb, $[_V [_V \text{tabe}]]$ $[_V \text{sase}]$ ‘eat-make.’

Finally, examine the data in (29a-c). All the examples in (29) involve both the verbal noun *ryakudatu* ‘plundering’ and the light verb $[_V \text{si}]$. However, there is an interesting difference in the status of their grammaticality.

- (29)a. **ryakudatu-si -ta.**
 plundering -do-**Pst**
 ‘Someone stole something.’
- b. **ryakudatu-no** si-kata
 plundering -**Gen** do-way
 ‘how to steal something’

- c. ***ryakudatu-si -kata**
 plundering -do-way ‘how to steal something’

Kageyama (1993), Sells (2002), among others, observe that there is a significant contrast between (29a-b) on the one hand and (29c) on the other. Namely, (29a-b) are well-formed expressions, whereas (29c) is not. A question thus immediately arises as to why this should be so. Significantly, as Hoshi (in press) suggests, the proposed analysis based on assumptions (8) and (9a-b) may provide a way to account for this contrast. Notice that in (29a), the verbal noun *ryakudatu* is suffixed with the light verb [_v *si*], and then, with the past tense marker [_T *ta*]. This implies that [_T *ta*] c-commands the projection of the verbal noun, licensing it as a V projection due to assumption (9b). In (29b), the verbal noun *ryakudatu* is suffixed with the Genitive Case marker [_K *no*], and [_K *no*] licenses the projection of the verbal noun as an N projection due to assumption (9a). On the other hand, in (29c), the verbal noun *ryakudatu* is not merged by a case marker, or is not c-commanded by a tense marker. Hence, under the proposed parsing-based analysis, the verbal noun *ryakudatu* cannot have its categorial status fixed in the structural environments/context in (29c) in any way, and thus, the language faculty may regard *ryakudatu* in (29c) as an illegitimate linguistic expression, as desired (cf. 29a-b).

In this section, based on Hoshi (in press, 2013), I have attempted to argue that the dynamics of language together with assumptions (8) and (9a-b) provides us with a straightforward way to account for a wide range of data involving a verbal noun, one major type of borrowing in Japanese (cf. Grimshaw and Mester 1988, Hoshi 1994, Saito and Hoshi 2000, among others). To repeat, I have argued here that a verbal noun is a special grammatical category in that the categorial status of a verbal noun is not specified with respect to V or N in the lexicon. Hence, the categorial status of the projection of a verbal noun must be updated and determined in accordance with structural environments/context in the left to right incremental processing of a sequence of words. If correct, the proposed analysis implies that the Japanese language might have accommodated borrowing such as verbal nouns by making the best use of the underspecification of lexical information and the update of such information in accordance with structural context in the parsing process.

Here, I have also tried to demonstrate that given assumptions (9a-b), the language faculty is able to parse very efficiently from left to right a string of words containing a verbal noun, even if its categorial status is not fixed concerning V or N in the lexicon. Furthermore, as in Hoshi (in press, 2013), I have argued that we must assume the ‘mixed category’ projections in structures such as (17d) and (19d) to account for the properties of verbal nouns in Japanese adequately. (17d) and (19d) are repeated here as (30) and (31), respectively.

(30) [_{TP} [_{VP} [_{VP} John-ga [_v Mary-kara [_v hooseki-o [_N **ryakudatu**]-[_K **o**]]]] [_v *si*]] [_T **ta**]] (=17d)

(31) [_{TP} [_{VP} [_{VP} John-ga [_v Mary-kara [_{NP} hooseki-no [_N **ryakudatu**]-[_K **o**]]]] [_v *si*]] [_T **ta**]] (=19d)

Notice that in (30) and (31), the bottom part of the projection of the verbal noun *ryakudatu* is an N projection, whereas the upper part of the projection is a V projection. As I have demonstrated in this section, the proposed processing-based analysis generates these types of ‘mixed category’ projection naturally in the course of the left to right incremental processing of a sequence of words, accounting for the intriguing properties of the examples in (16), (18), (20a-b), (24), and (26a-d) (see also the discussion based on configuration 23). Significantly, however, a

‘standard’ syntactic theory, where syntactic structures must be built ‘bottom up,’ cannot generate ‘mixed category’ projections such as (30) or (31). This is because under a ‘standard’ syntactic theory, the categorial status of the upper part of the projection must be based strictly on that of the lower part of the projection. Thus, if the proposed parsing-based analysis of verbal nouns is indeed correct, it suggests that X’ Theory is not only unnecessary (Chomsky 1995, etc.), but is also incorrect. Hence, X’ Theory must be eliminated from a linguistic theory, and the language faculty generates syntactic structures ‘top to bottom’ step by step in the left to right incremental processing of a sequence of words (Phillips 1996, Kempson et al. 2001, Cann et al. 2005, etc.)⁶

In the next section, I attempt to show that the proposed parsing-driven categorization analysis of verbal nouns might also shed a new light on the nature of a special type of compound formation in Japanese, discovered by Shibatani and Kageyama (1988).

4. Parsing-driven Categorization and Compound Formation

Consider again Shibatani and Kageyama’s (1988) example in (24), repeated here as (32).

- (32) Kanai **-ga** Amerika-**o** **hoomon**-no ori -ni -wa, iroiro
 my wife-Nom America-Acc visiting-Gen occasion-on-Top much
 osewa -ni narimasi -ta. (=6, 24)
 hospitality-Adv.Part. she.receive-Pst
 ‘Thank you for your generous hospitality when my wife visited America.’

Recall that under the proposed processing-based analysis, the language faculty parses a string of words given in (32) as follows:

- (33)a. [_{VP} Kanai-**ga** [_{VP} Amerika-**o** [_{VP/N} **hoomon**]]] (=25a) ==>
 b. [_{VP} Kanai-**ga** [_{VP} Amerika-**o** [_N **hoomon**]-[_K **no**]]] (=25b) ==>
 c. [_{TP/NP} [_{VP} Kanai-**ga** [_V Amerika-**o** [_N **hoomon**]-[_K **no**]]] [_{T/N} **ori**]] ... (=25c)

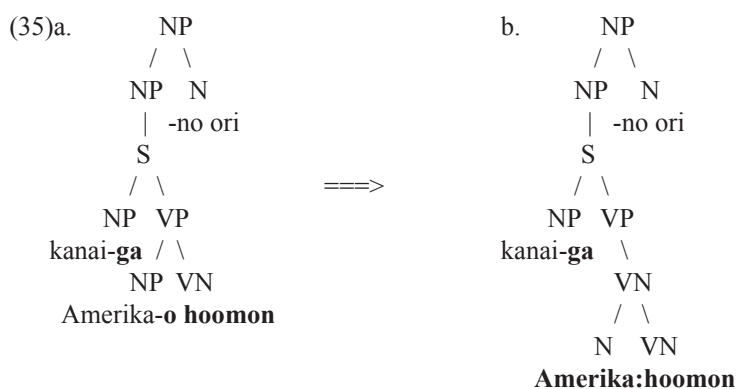
As shown in (33a), after the two arguments, *kanai-ga* and *Amerika*, are parsed, the verbal noun *hoomon*, which is Sino-Japanese, is parsed and is introduced to the passed tree underspecified with respect to V or N due to assumption (8). As seen in (33b), then, the Genitive Case marker [_K *no*] is parsed and attached to the lowest projection of the verbal noun, licensing it as an N projection due to assumption (9a). As illustrated in (33c), finally, the time denoting noun [_{T/N} *ori*] merges the highest projection of *ryakudatu*, and licenses the remaining underspecified projection as a V projection due to assumption (9b).

Importantly, Shibatani and Kageyama (1988) discover that in this construction, an internal argument like the locative argument *Amerika* ‘America’ in (32) can be adjoined directly to a verbal noun, as follows:

- (34) Kanai **-ga** [**Amerika:hoomon**]-no ori -ni -wa, iroiro
 my wife-Nom [America:visiting]-Gen occasion-on-Top much
 osewa -ni narimasi -ta.
 hospitality-Adv.Part. she.receive-Pst

The symbol ‘:’ is intended to mark a special phonological boundary observed between the noun *Amerika* and

the verbal noun *hoomon*. Furthermore, Shibatani and Kageyama (1988) argue that this process, schematically represented in (35a-b), is not just a simple case of particle ellipsis, but that it constitutes a case of full-fledged compound formation.⁷ (VN stands for a verbal noun in (35a-b).)



As seen in (35a-b), Shibatani and Kageyama (1988) claim that the compound formation in question takes place in the complement clauses selected by the head nouns of time like *ori* ‘occasion.’ In addition, Shibatani and Kageyama (1988) propose that the compound formation in (35a-b) takes place after syntax, probably in PF (cf. Kageyama 1993), calling compounds like [*Amerika:hoomon*] in (34) ‘postsyntactic compounds.’

The reason for their claim that compounds such as [*Amerika:hoomon*] in (34) are not formed in the lexicon or in the syntax is primarily phonological. In Japanese, lexical compounds are always pronounced with one accentual peak. For example, the nouns *denki* ‘electricity’ and *kaisya* ‘company,’ each of which has its own accent in isolation, are pronounced with a single accentual peak when they are compounded as in (36).

- (36) — — —
- denki + kaisya ==> denki-gaisya
- electricity company ‘electricity company’

Those words that have been claimed to be ‘syntactically’ formed (e.g. by Shibatani 1973, 1976) also obey the pitch pattern characteristic of a word as shown in (37a-b).

- (37)a. — — —
- yomi-hazimeru (yomu, hazimeru) ‘begin to read’
- read-begin
- b. —
- yom-aseru ‘cause to read’
- read-Cause

The forms Shibatani and Kageyama (1988) call ‘postsyntactic compounds,’ on the other hand, exhibit a completely different pitch pattern, with the inherent pitch patterns of the individual members kept intact and a slight pause put after the first member. In short, according to Shibatani and Kageyama (1988), ‘they are pronounced as if their members were independent words, and yet as one unit.’ Compare the lexical compounds in (38a) (indicated by ‘-’) with their ‘postsyntactic’ counterparts in (38b) (indicated by ‘:’):

- (38)a. — — —
- Amerika-hoomon, Yooroppa-ryokoo
- America visit Europe tour

- b. Amerika:hoomon(-no ori), Yooroppa:ryokoo(-no ori)
 ‘while visiting America’ ‘while traveling in Europe’

Significantly, Shibatani and Kageyama (1988) also discover the sharp contrast like the one in (39a-b). Namely, Shibatani and Kageyama (1988) observe that the light verb construction in (39a) is grammatical, whereas the ‘postsyntactic compounding’ is impossible in the light verb construction as shown in (39b) (cf. 34).⁸

- (39)a. Kanai **-ga** Amerika-**o** **hoomon**-si-ta.
 My wife-Nom America-Acc visiting –do-Pst
 ‘My wife visited America.’
- b. *Kanai **-ga** [**Amerika:hoomon**]-si-ta.
 my wife-Nom [America:visiting] -do-Pst

Hence, a question immediately arises as to why the ‘postsyntactic compounding’ unique to Japanese is allowed in (34), while such compound formation is disallowed in (39b). That is, an important question arises as to why the compound formation in question is dependent on structural environments/context (see 34 vs *39b). Here, I would like to suggest a new account for the contrast based on the proposed parsing-driven categorization of verbal nouns. Namely, I wish to claim that it might be the proposed parsing-driven categorization that permits a verbal noun to undergo compound formation in the left to right incremental processing of a sequence of words. This is because the fixed categorial information seems to be required for compound formation, and the categorial status of a verbal noun is determined only in the parsing process. Consequently, I wish to suggest that ‘postsyntactic compounding’ might indeed take place in the parsing process, not in PF or at S-structure (cf. Shibatani and Kageyama 1988, Kageyama and Shibatani 1989, Kageyama 1993).⁹

The parsing processes that I wish to propose for (34) and (39b) are given below. First, let us examine (40a-c) to see how the language faculty parses a string of words given in (34).

- (40)a. [_{VP} Kanai-ga [_{VP/N} [_N Amerika] [_{VP/N} hoomon]]] ==>
- b. [_{VP} Kanai-ga [_N [_N Amerika] [_N hoomon]]]-[_K no]] ==>
- c. [_{TP/NP} [_{VP} Kanai-ga [_N [_N Amerika] [_N hoomon]]]-[_K no]] [_{TP/N} ori]] ...

As shown in (40a), first, the language faculty parses *kanai-ga*. Because the argument *kanai* ‘wife’ is suffixed with the Nominative Case marker *-ga*, the language faculty predicts the projection immediately dominating *kanai-ga* to be a V projection. Next, [_N Amerika] ‘America’ is parsed. Importantly, [_N Amerika] is not suffixed with any case particle, and thus, the language faculty anticipates that [_N Amerika] will be part of a compound whose head is the following verbal noun *hoomon* ‘visiting.’ *Hoomon*, being a verbal noun, is then introduced to the parsed tree underspecified due to assumption (8). Hence, crucially, when we have parsed or generated a string of words from *kanai-ga* up to *hoomon* in (40a), the categorial status of the head of the compound [_{VP/N} [_N Amerika] [_{VP/N} hoomon]] is not fixed yet under the proposed analysis. Under the assumption that the fixed categorial label is a prerequisite for compound formation, [_{VP/N} [_N Amerika] [_{VP/N} hoomon]] in (40a) is thus just a potential compound but is not yet licensed as a full-fledged compound word (cf. lexical compounds such as [_N [_N denki] [_N gaisya]]).

As we can see in (40a), both the lowest projection and the second lowest projection of *hoomon* thus turn out to be potential [+N] projections. Then, as in (40b), the Genitive Case marker [_K *no*] is parsed, and is attached to the second lowest projection of *hoomon*, licensing the underspecified projection of *hoomon* as an N projection due to assumption (9a), and finally forming [_N [_N *Amerika*] [_N *hoomon*]], a full-fledged N+N compound. As is well known, N+N compounds are abundant in Japanese, and it seems that there is no problem for the language faculty to form this type of compound productively in the left to right incremental processing of a sequence of words, given the parsing-driven categorization.

Significantly, given the underspecification of a verbal noun and the proposed parsing-driven categorization, the N+N compound [_N [_N *Amerika*] [_N *hoomon*]] is legitimately formed only at this point of the parsing process, i.e. after both *Amerika* and *hoomon* are parsed or pronounced, and then, the Genitive Case marker [_K *no*] is attached to the second lowest projection of *hoomon*. In other words, [_N *Amerika*] and [_{?V/?N} *hoomon*] are weakly tied together as members of a potential compound in (40a), when we parse or generate [_N *Amerika*] and [_{?V/?N} *hoomon*]. Consequently, this might be why we cannot pronounce [_{?V/?N} [_N *Amerika*] [_{?V/?N} *hoomon*]] as one compound word with one accentual peak, and we pronounce *Amerika* and *hoomon* somewhat separately (see 38a vs. 38b). Only after the Genitive Case marker [_K *no*] attaches to the second lowest projection of *hoomon*, as in (40b), [_N *Amerika*] and [_N *hoomon*] are strongly tied together as members of a legitimate compound in our mind. This parsing process, I believe, could capture Shibatani and Kageyama's (1988) intuition that the members of 'postsyntactic compounds' appear to be independent, but yet to form one unit. As seen in (40c), finally, the time denoting noun *ori* 'occasion' is parsed, and c-commands the whole projection of *hoomon*, licensing the remaining underspecified projection as a V projection due to assumption (9b).

On the other hand, the language faculty parses a string of words given in (39b) as follows:

- (41)a. [_{?V} *Kanai-ga* [_{?V/?N} [_N **Amerika**] [_{?V/?N} **hoomon**]]] ==>
- b. [_{VP} [_{?V} *Kanai-ga* [_{?V/?N} [_N **Amerika**] [_{?V/?N} **hoomon**]]] [_V *si*] ==>
- c. *_{[TP} [_{VP} [_{VP} *Kanai-ga* [_V [_N **Amerika**] [_V **hoomon**]]] [_V *si*] [_T **ta**]]

As seen in (41a), the language faculty first parses *kanai-ga*. Since *kanai* 'my wife' is suffixed with the Nominative Case marker *-ga*, the language faculty anticipates the projection immediately dominating *kanai-ga* to be a V projection. Then, [_N *Amerika*] is parsed. Because [_N *Amerika*] appears without any case particle, the language faculty predicts that [_N *Amerika*] should become part of a compound whose head is the following lexical item. Then, the verbal noun *hoomon* is parsed, and is introduced to the parsed tree underspecified with respect to V or N due to assumption (8). Importantly, the categorial label of the head of the compound [_{?V/?N} [_N *Amerika*] [_{?V/?N} *hoomon*]] is not yet fixed in (41a). Under the assumption that the fixed categorial label is required for compound formation, [_{?V/?N} [_N *Amerika*] [_{?V/?N} *hoomon*]] in (41a) is thus just a potential compound but is not yet licensed as a full-fledged compound word.

Then, as shown in (41b), the light verb [_V *si*] is parsed, and merges the whole projection of *hoomon*. Finally, as illustrated in (41c), the past tense marker [_T *ta*] is parsed, and c-commands the entire projection including the projection of [_V *si*], licensing the underspecified projection of the verbal noun *hoomon* as a V projection due to assumption (9b). Consequently, the full-fledged N+V compound [_V [_N *Amerika*] [_V *hoomon*]] is constructed under the proposed parsing-driven categorization analysis. Importantly, however, as Kageyama (1993) claims, Modern Japanese rarely forms an N+V compound for some reasons, and I suggest this might be why examples such as (39b) turn out to be ill-formed (cf. the N+N compound [_N [_N *Amerika*] [_N *hoomon*]] in (40b-c) for (34)).

Importantly, the proposed analysis based on (8) and (9a-b) also provides a direct way to account for the well-formedness of another type of ‘postsyntactic compound’ discovered by Kageyama and Shibatani (1989). Examine the examples below:

- (42)a. Sin-kuukoo-no kensetu-ni hantai -su-ru.
 new-airport-Gen building-to opposing-do-Prs.
 ‘We are opposed to the construction of a new airport.’
- b. [**Sin-kuukoo:kensetu**]-ni hantai -su-ru.
 [New-airport:building]-to opposing-do-Prs

In (42a), the verbal noun *hantai*, which is of Chinese origin, is suffixed with the light verb [_V *su*]. Here, the verbal noun *hantai* ‘opposing’ selects [*sin-kuukoo-no kensetu*] ‘the construction of a new airport’ as an internal argument. The head of the internal argument, *kensetu* ‘building,’ is also a Sino-Japanese verbal noun, and Kageyama and Shibatani (1989) observe that *sin-kuukoo* and *kensetu* may undergo ‘postsyntactic compounding’ as shown in (42b) (cf. 34 vs. *39b). In (42b), the ‘postsyntactic compound’ [*sin-kuukoo:kensetu*] is formed, but the compound is not contained in the complement clause selected by time denoting nouns such as [_{TN} *ori*] (cf. 34, 35a-b).

Under the proposed parsing-driven categorization analysis of verbal nouns, [*sin-kuukoo:kensetu*] in (42b) parallels [*Amerika:hoomon*] in (34), and turns out to be a well-formed N+N compound in the left to right incremental processing. In other words, [*sin-kuukoo:kensetu*] in (42b) does not parallel [*Amerika:hoomon*] in (39b), and it does not become an N+V compound in the parsing process. Consider below why this should be the case for (42b):

- (43)a. [_{?V/?N} [_N **sin-kuukoo**] [_{?V/?N} **kensetu**]] =>
- b. [_N [_N **sin-kuukoo**] [_N **kensetu**]]-[_P **ni**] =>
- c. [_{?V} [_N [_N **sin-kuukoo**] [_N **kensetu**]]]-[_P **ni**] [_{?V/?N} **hantai**] =>
- d. [_{VP} [_{?V} [_N [_N **sin-kuukoo**] [_N **kensetu**]]]-[_P **ni**] [_{?V/?N} **hantai**] [_V **su**]] =>
- e. [_{TP} [_{VP} [_N [_N **sin-kuukoo**] [_N **kensetu**]]]-[_P **ni**] [_V **hantai**] [_V **su**]] [_T **ru**]]

As shown in (43a), first, [_N *sin-kuukoo*] ‘a new airport’ is parsed. Here, [_N *sin-kuukoo*] is not suffixed with any case particle, and thus, the language faculty predicts [_N *sin-kuukoo*] to be part of a compound whose head is the following word. Then, the verbal noun *kensetu* ‘building’ is parsed, and is introduced to the parsed representation underspecified concerning V or N due to assumption (8). Then, as illustrated in (43b), the Dative marker [_P *ni*] ‘to’ is parsed, and is attached to the highest projection of the verbal noun due to its semantic content. Probably because the Dative marker [_P *ni*] morphologically c-selects a [+N] element exactly like Case markers such as [_K *o*] or [_K *no*], the Dative marker [_P *ni*] licenses [_{?V/?N} [_N *sin-kuukoo*] [_{?V/?N} *kensetu*]] as an N projection due to assumption (9a). Consequently, thanks to the proposed parsing-driven categorization, the compound [_N [_N *sin-kuukoo*] [_N *kensetu*]] is successfully formed as a well-formed N+N compound exactly like the N+N compound [_N [_N *Amerika*] [_N *hoomon*]] in (34), as desired (cf. *_{[V} [_N *Amerika*] [_V *hoomon*]] in (39b)).

Then, as shown in (43c), the other verbal noun *hantai* ‘opposing’ is parsed, and is introduced to the parsed tree underspecified with respect to V or N due to (8). Since the internal argument [_N [_N *sin-kuukoo*] [_N *kensetu*]]-[_P

ni] is not suffixed with the Genitive Case marker [_K*no*], the language faculty anticipates the projection immediately dominating [_N[_N*sin-kuukoo*] [_N*kensetu*]]- [_P*ni*] should be a V projection. As seen in (43d), the light verb [_V*su*] is then parsed and introduced to the tree. Subsequently, as illustrated in (43e), the present tense marker [_T*ru*] is parsed, and c-commands all the projections including the projection by the verbal noun *hantai*, licensing it as a V projection due to assumption (9b). Finally, [_V*hantai*] licenses the Dative marker [_P*ni*] ‘to’ as a verb.

In this section, I have attempted to explain some of the intriguing properties of ‘postsyntactic compounds,’ which appear to be unique to Japanese. Observing that the head of Shibatani and Kageyama’s (1988) ‘postsyntactic compounds’ is always a verbal noun (cf. Kageyama and Shibatani 1989, Kageyama 1993, etc.), I have attempted to show that it might be the proposed parsing-driven categorization that allows a verbal noun to undergo compound formation productively in the left to right incremental processing of a sequence of words. If the proposed analysis of ‘postsyntactic compounds’ is indeed correct, it implies that ‘postsyntactic compounds’ are formed in the parsing process, not in PF or at S-structure, thanks to the parsing-driven categorization, and that human language is a dynamic system which could form words in the left to right incremental processing as well (cf. Shibatani and Kageyama 1988, Kageyama and Shibatani 1989, Kageyama 1993, Ito and Sugioka 2002, Yumoto 2011, among others).

5. Conclusion

In this paper, heavily relying on the claim that most of the verbal nouns in Japanese are borrowing, and they constitute a special grammatical category (Martin 1975, Kageyama 1993, Ito and Sugioka 2002, Sugioka 2009, among others), I have attempted to provide further evidence for Hoshi’s (in press, 2013) proposal that verbal nouns are unique in that the categorial status of a verbal noun is not fixed with respect to V or N in the lexicon. Hence, the categorial label of the projection of a verbal noun must be determined in accordance with structural environments/context step by step in the left to right incremental processing of a sequence of words. Consequently, I have suggested that the Japanese language might have accommodated borrowing such as verbal nouns by making the best use of the underspecification of a lexical item and its own grammatical resources such as case and tense markers.

In so doing, I have tried to demonstrate that there might be a possibility that the nature of this special grammatical category, verbal nouns in Japanese, provides us with an opportunity to reveal some of the fundamental properties of a natural language. Namely, through an examination of the properties of verbal nouns, I have attempted to show that as Dynamic Syntax proposes, a natural language is a dynamic system where the nature of a lexical item is very often underspecified, and is updated and fixed step by step in the left to right incremental processing of a sequence of words (Kempson et al. 2001, Cann et al. 2005, Cann et al. 2009, Kempson and Kiaer 2009, Kempson and Kurosawa 2009, among others; cf. Sperber and Wilson 1995, Phillips 1996). I have also tried to demonstrate that language is a dynamic system which builds up linguistic representations not ‘bottom-up,’ but ‘top to bottom’ step by step in the left to right incremental processing (Phillips 1996, Kempson et al. 2001, etc.) Furthermore, I have attempted to argue that ‘postsyntactic compounds’ discovered by Shibatani and Kageyama (1988) might be the one which helps us to uncover some of the significant properties of a natural language. That is, a natural language, being a dynamic system, may be capable of forming words in the course of the left to right incremental processing as well.

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- 1 The reader is referred to Hoshi (in press) for some discussion of Saito and Hoshi’s (2000) incorporation analysis of light verb construction and the proposed processing-based analysis of verbal nouns.
- 2 See Terada (1990), Kageyama (1993), Sato (1993), Matsumoto (1996), Dubinsky (1997), among others, for various types of analysis of light verb constructions in Japanese.
- 3 Grimshaw and Mester (1988), Hoshi (1994), Saito and Hoshi (2000), among others adopt a ‘fixed’ view of a verbal noun, where a verbal noun is assumed to be inherently N. Hence, under their analyses, it is not obvious why the Genitive Case-marked theme argument *hooseki-no* is not permitted in examples such as (14). See Hoshi (in press) for a detailed discussion of this issue.
- 4 Under an analysis of Japanese light verb constructions in terms of complex predicate formation (Grimshaw and Mester 1988, Hoshi 1994, Saito and Hoshi 2000, etc.), however, the predicate fronting data in (20a-b) pose a problem. Under such an analysis, [*Mary-kara hooseki-o ryakudatu*]-o does not form a constituent in (16), and [*Mary-kara hooseki-no ryakudatu*]-o is not a constituent in (18), either.

Consider, for instance, Saito and Hoshi’s (2000) LF representations in (ia) and (ib) for (16) and (18), respectively.

- (i)a. [_{TP} John³-ga Mary-kara² hooseki¹-o [_{NP} *t*_N] [_V [_N ryakudatu]-o si] ta]. (LF)
(agent³(source²(theme¹)))
- b. [_{TP} John³-ga Mary-kara² [_{NP} hooseki¹-no *t*_N] [_V [_N ryakudatu]-o si] ta]. (LF)
(agent³(source²(theme¹)))

As (ia) shows, under Saito and Hoshi’s analysis, [*Mary-kara hooseki-o ryakudatu*]-o does not form a constituent at any point of the derivation (cf. 20a). As (ib) also indicates, [*Mary-kara hooseki-no ryakudatu*]-o is not a constituent at any point of the computation (cf. 20b). See Hoshi (in press) for a detailed discussion of this issue.

- 5 Hoshi (1994) and Saito and Hoshi (2000) assign the structures in (ia-b) to (16) and (18), respectively (cf. Grimshaw and Mester 1988, Grimshaw 1990).
- (i)a. [_{TP} John³-ga Mary-kara² hooseki¹-o [_{NP} *t*_N] [_V [_N ryakudatu]-o si] ta] (LF)
(agent³(source²(theme¹)))
- b. [_{TP} John³-ga Mary-kara² [_{NP} hooseki¹-no *t*_N] [_V [_N ryakudatu]-o si] ta] (LF)
(agent³(source²(theme¹)))

(16) and (18) are two types of light verb construction in Japanese, and they are semantically equivalent. However, the LF representations for them in (ia-b) are significantly different. See Hoshi (in press) for some discussion of this issue.

- 6 See Sugioka (2009) for more arguments for the proposed ‘mixed category’ projections.
- 7 The reader is referred to Shibatani and Kageyama (1988), Kageyama and Shibatani (1989), and Kageyama (1993) for a

number of arguments for the compound formation in examples such as (34).

- 8 The examples below involve ‘postsyntactic compounds,’ and Shibatani and Kageyama (1988) report that they are all ungrammatical.

- (i)a. *[katei : hoomon]-su-ru
 [home : visit]-do-prs
 a’ *[katei : hoomon]-o su-ru
 [home : visit]-Acc do-Prs
 b *[kaigai : ryokoo]-su-ru
 [overseas : travel]-do-Prs
 b’. *[kaigai : ryokoo]-o su-ru
 [oversea : travel]-Acc do-Prs

It seems to me, however, that (ia’) is better than (ia), and (ib’) sounds better than (ib). I wish to examine the nature of these examples in great detail in my future research.

- 9 The reader is referred to Shibatani and Kageyama (1988), Kageyama and Shibatani (1989) and Kageyama (1993) for their accounts for the contrast between (34) and (39b).