

show the same behavior in suffixation. Contrary to this prediction, N-to-V and V-to-N conversion differ as to whether their outputs can be bases of certain suffixes called class I suffixes, as will be shown in section 2. That is, although both N-to-V and V-to-N conversion have a category-changing function in common, their outputs show the inconsistent behavior in terms of suffixation. This paper aims to account for why N-to-V and V-to-N conversion show behavioral contrast in spite of their common function. To answer this question, I adopt the framework of Emonds (2000, 2005), who assumes multiple levels of lexical insertion, and propose that a zero-verbalizer and a zero-nominalizer are inserted at different levels. Based on this proposal, I argue that the process of N-to-V conversion and that of V-to-N conversion are different. More precisely, I argue that based on Hale and Keyser's (2002) approach to denominal verbs, N-to-V conversion is a process where a complex verb is derived by a base noun and a zero-verbalizer, whereas V-to-N conversion is a process that makes a simplex noun from a complex structure composed of a verb and a zero-nominalizer through Spell-Out (cf. Uriagereka (1999), Sato (2010)).

This paper is organized as follows. Section 2 shows the difference between N-to-V and V-to-N conversion. Section 3 introduces the theoretical framework adopted in this study, which consists of two basic assumptions: the decomposition of the lexicon and multi-level lexical insertion. Section 4 proposes the processes of the two types of conversion. Based on the proposal, section 5 gives an account of the difference observed in section 2. Section 6 provides supporting evidence for the proposal. Section 7 shows that the proposed analysis can be applied to compounding and gives an implication. Section 8 offers concluding remarks.

2. The Difference between N-to-V and V-to-N Conversion

As mentioned in the previous section, zero-derivation analysis predicts that the outputs of N-to-V and V-to-N conversion behave the same way in suffixation. However, they behave differently with respect to a certain class of suffixation, so called class I suffixation (cf. Siegel (1974), Allen (1978), Kiparsky (1982)); the outputs of V-to-N conversion, but not those of N-to-V conversion, can be bases of class I suffixes.¹

¹ According to Siegel (1974), Allen (1978), and Kiparsky (1982), affixes are classified into class I and class II according to their phonological, morphological, and semantic behavior. For example, class I affixes, but not class II ones, cause a stress shift. Observe the following examples, where subscripts indicate the class of the suffix.

- (i) a. *cúrious* → *curiós-ity_I*
 b. *cúrious* → *cúrious-ness_{II}*

Among class I suffixes, some select verbs as their base and others are attached to nouns, as exemplified in (4a) and (4b).

- (4) a. [[destruct]_V -ion]_N, [[attract]_V -ive]_A, [[accept]_V -ance]_N,
 [[inform]_V -atory]_A, [[expect]_V -ant]_A
 b. [[nation]_N -al]_A, [[danger]_N -ous]_A

Given the selectional properties of the suffixes in (4), it is likely that the suffixes in (4a) and (4b) can also attach to converted verbs and nouns, respectively. However, this is not the case. Observe the following examples:

- (5) a. *gesturation, *figurive, *patternance, *crusadatory, *cementant
 b. contractual, murderous, rebellious
 (Kiparsky (1982:13), underlines mine)

The bases in (5a) and (5b) are outputs of N-to-V conversion and V-to-N conversion, respectively. The unacceptability in (5a) shows that class I suffixes cannot be attached to the outputs of N-to-V conversion. On the other hand, they can be attached to the outputs of V-to-N conversion, as the examples in (5b) show. This contrast between the outputs of N-to-V and V-to-N conversion is represented in (6).

- (6) a. * [[[gesture]_N -∅]_V -ation]_N
 b. [[[contract]_V -∅]_N -al]_A

The contrast observed above raises the question of why the outputs of N-to-V and V-to-N conversion behave differently in class I suffixation although in both cases the categories of the bases are changed by the zero-suffix.² I argue in section

(Scalise (1984:81))

In addition, it is generally said that class I affixes are non-productive and tend to have non-compositional meanings while class II affixes are productive and tend to have compositional meanings.

² Kiparsky (1982) explains the contrast by assuming that zero-suffixes are also classified into class I and class II. First, observe the following examples:

- (i) a. * [[[thought]_N -full]_{II} -ity]_I]_N
 b. [[[act]_V -ive]_I -ity]_I]_N
 (Ito and Sugioka (2002:12), with modifications)

The contrast in (i) shows that once a class II suffix is attached to a base, a class I suffix cannot be attached further. If a zero-verbalizer is a class II suffix and a zero-nominalizer is a class I suffix,

5 that the difference between them follows from their derivational differences based on the proposal in section 4. The next section introduces the theoretical assumptions that I adopt in this paper.

3. Theoretical Assumptions

3.1. *The Lexicon without Word Formation Rules*

Many studies of the lexicon have focused on the relationship between the lexicon and syntax. Their main interest lies in eliminating the redundancy between the lexicon and syntax by reorganizing or decomposing the lexicon. The traditional model of the lexicon in the generative theories assumes that the lexicon contains word formation rules, which derive complex words from simplex ones (cf. Allen (1978)). Some studies simplify the lexicon by eliminating or minimizing word formation rules in the lexicon, and by assuming that morphological operations are also performed in syntax (cf. Baker (1988), Lieber (1992), Halle and Marantz (1994)). Emonds (2000) also reorganizes the composition of the lexicon and eliminates word formation rules from the lexicon. Along with the reorganization, he proposes different levels of lexical insertion from the lexicon. The following subsections introduce his basic ideas on the lexicon and lexical insertion.

3.2. *The Decomposition of the Lexicon*

The most characteristic point of Emonds' (2000) proposal is the decomposition of the lexicon into two subparts: the Dictionary and the Syntacticon. The Dictionary stores lexical categories (N, V, A, and P) and the Syntacticon stores functional categories (e.g. D, derivational affixes, and inflectional affixes). Lexical categories and functional categories are distinguished from each other by the presence or absence of the purely semantic features *f*, which have no role in syntax (Emonds (2000:116)). If an item has *f*, it belongs to lexical categories. If an item lacks the feature, it is a member of functional categories.³ In addition to the

the contrast can be explained in the same way with overt suffixation, as shown in (ii).

- (ii) a. * [[[gesture]_N -Ø_{II}]_V -ation_I]_N
 b. [[[contract]_V -Ø_I]_N -al_I]_A

For detailed discussion, see Kiparsky (1982:11-14).

³ Emonds (2000) assumes another type of features, which is called "cognitive syntactic features F." They are centrally used in syntax and LF. Those features have canonical positions on which they are realized (Emonds (2000:8)). For example, the feature ±ANIMATE is realized on N, ±ACTIVITY on V, ±PATH on P, and ±PAST on I. As indicated by these features, F can be present on all syntactic categories, and thus they cannot distinguish between lexical and functional categories.

Note that not all N, V, A, and P have purely semantic features *f*. There are subclasses of N,

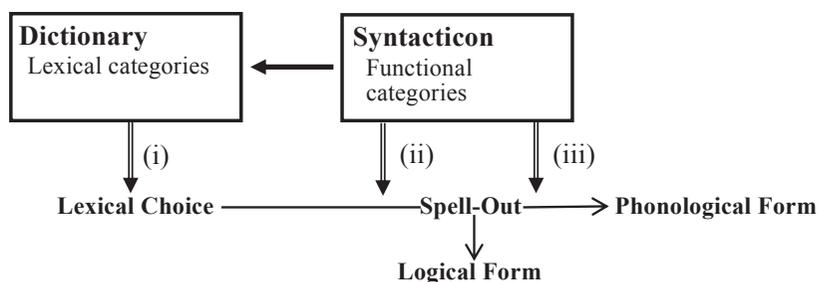
presence or absence of f , Emonds (2000:160) shows certain differences between the items of the Dictionary and the Syntacticon. One of them is that the items stored in the Syntacticon may be phonetically zero, but those in the Dictionary cannot (Emonds (2000:120)).

Whether a lexical item is stored in the Dictionary or the Syntacticon, it has a lexical entry. The lexical entry contains the subcategorization frames. They are information that is referred to when the item is combined with another item in syntax.

3.3. Multi-Level Lexical Insertion

Apparently, insertion of the Dictionary item and the Syntacticon item seems to take place in the same way. However, Emonds (2000) assumes that they are different in possible timing of lexical insertion. The relationship among the Dictionary, the Syntacticon, and a syntactic derivation is shown in the schema in (7). Downward arrows (i), (ii), and (iii) represent lexical insertion.⁴

(7) Multi-level Lexical Insertion



(cf. Emonds (2000:117, 437))

As indicated in (7), possible levels of lexical insertion differ between items of the Dictionary and those of the Syntacticon. We call this model the multi-level lexical insertion model.

Let us outline the two levels of lexical insertion: Deep Insertion and Syntactic Insertion, which are represented by arrow (i) and (ii) in (7) respectively. Firstly, Deep Insertion takes place prior to syntactic computation. Deep Insertion is the only possible level of insertion for the members of the Dictionary. Accordingly,

V, A, and P whose members lack purely semantic features f and behave like functional categories (Emonds (2000:9)). Such subclasses are called “semi-lexical categories” (Emonds (2001)), and are assumed to be stored in the Dictionary.

⁴ In (7), I simplified the schemas in Emonds (2000:117, 437) by abstracting away from what is irrelevant to our purposes.

lexical items such as *cat*, *develop*, and *beautiful* are inserted at this level, for example. The items that undergo Deep Insertion are not restricted to those in the Dictionary. Emonds (2000) hypothesizes that items in the Syntacticon can also undergo Deep Insertion. Deep Insertion of items of the Syntacticon is a process in which an item in the Syntacticon is inserted into syntax through the Dictionary. This process is represented by the leftward arrow in (7). Recall that the items in the Dictionary need to have the purely semantic features *f*. Since items from the Syntacticon lack such features, they need to be assigned *f* in order to be licensed as the items of the Dictionary. The features are assigned only in the Dictionary. After the assignment of *f*, the item from the Syntacticon undergoes Deep Insertion along with items in the Dictionary. The examples of items that are inserted at this level are non-productive affixes. Deep Insertion of the items in the Syntacticon may result in non-compositional meanings.

Emonds (2005:section 4.1) assumes that which affix can undergo Deep Insertion is specified in the lexical entry of its host. For example, the lexical entry of the verb *develop* is shown in (8).⁵

$$(8) \quad \textit{develop}, \mathbb{V}, f_1, \dots, < _ (+ment) >$$

The “affix selecting feature” (Emonds (2005:253)) in the lexical entry in (8) (i.e. $< _ (+ment) >$) specifies that the verb *develop* can be combined with the suffix *-ment*. Due to this specification, the suffix *-ment* undergoes Deep Insertion, and the morphemes *develop* and *-ment* are merged in syntax.

Let us now turn to the second type of insertion called Syntactic Insertion. This insertion occurs just prior to Spell-Out, which is represented by downward arrow (ii) in (7).⁶ As illustrated in (7), the items in the Syntacticon, but not those in the Dictionary, can undergo Syntactic Insertion. Productive suffixes are, for example, inserted at this level. After inserted, they are combined with a base according to the specification in their lexical entries, like in (9).

⁵ I follow Emonds (2000, 2005) for the notation of lexical entries. Especially, for the information contained in lexical entries, see Emonds (2000:43). I omit here, for convenience, the subcategorization frame and syntactic features which also need to be specified. The omission is indicated by the notation ‘...’ in this paper, as in (8).

⁶ In addition to Deep Insertion and Syntactic Insertion, Emonds (2000) assumes the third type of insertion from the Syntacticon, which is irrelevant to this paper. This insertion is called PF Insertion (Emonds (2000, 2005)). PF Insertion occurs after Spell-Out, as indicated by arrow (iii) in (7). Unlike in the case of Syntactic Insertion, the items which undergo PF Insertion are not sent to LF. That is, such items do not contribute to semantic interpretation. Therefore, the items which are inserted at this level realize purely syntactic features. The examples which undergo PF Insertion are inflectional suffixes like *-s* and *-ed*.

(9) *ment*, N, ..., +<V__>

The subcategorization frame in the lexical entry of *-ment* in (9) (i.e. +<V__>) denotes that the suffix *-ment* can be attached to verbs. As long as this subcategorization frame is satisfied, the suffix can be combined to any items and derive a noun.

3.4. Multi-Level Lexical Insertion Account of Result and Complex Event Nominals

As the suffix *-ment* exemplifies, items of the Syntacticon can in principle undergo both Deep Insertion and Syntactic Insertion. The difference in the level of insertion results in different interpretation of a derived word in the lexical insertion model. In the case of nominalization, Deep Insertion and Syntactic Insertion derive result nominals and complex event nominals, respectively. For example, Deep Insertion of the suffix *-ment* derives result nominals, and Syntactic Insertion of it derives complex event nominals (Emonds (2000:section 4.7.2)), which is represented by (10a) and (10b), respectively.

- (10) a. We protest the city's three treeless developments with no schools.
 b. We protest the city's constant development into the hills to attract industry.

(Emonds (2000:152))

Emonds (2005:253) assumes that the “affix selecting feature” in (8), which triggers Deep Insertion of *-ment*, is linked to the semantic content of the derived word. Due to this linkage, when the suffix *-ment* undergoes Deep Insertion, whereby a result nominal is derived, the noun *development* has a meaning that cannot be attributed to its constituents, i.e. the non-compositional or idiosyncratic meaning (‘a residential area’ in this case). Since the result nominal *development* refers to a concrete entity and lacks eventive meanings, it can be pluralized but does not accept adjectives with the sense of time adverbials and PPs which are taken by the base verb *develop*, as shown in (11).

- (11) We protest the city's three (*constant) developments (*into the hills).

(Emonds (2000:152))

On the other hand, when the suffix *-ment* undergoes Syntactic Insertion, the overall meaning of the complex event nominal *development* is derived from the meanings of

its parts, i.e. the verbal base *develop* and the suffix *-ment*. Accordingly, Syntactic Insertion of an item of the Syntacticon results in compositional meanings. Thus, unlike result nominals, complex event nominals have eventive interpretations but do not refer to concrete objects, as shown in (12).

- (12) We protest {*high-rise / *treeless} development to attract industry.
(Emonds (2000:152), with slight modifications)

The adjectives *high-rise* and *treeless* modify concrete objects. The fact that they cannot co-occur with *development* indicates that the meaning of the nominal is an event but not a concrete object.

To summarize this section, Emonds (2000) divides the lexicon into the Dictionary and the Syntacticon and assumes the two levels of lexical insertion from the lexicon called Deep Insertion and Syntactic Insertion. Items in the Dictionary undergo Deep Insertion and those in the Syntacticon undergo both Deep Insertion and Syntactic Insertion. Non-productive affixes undergo Deep Insertion, which is triggered by the specification in the lexical entries of their hosts. These affixes may bear non-compositional meanings. Productive affixes, on the other hand, undergo Syntactic Insertion. The words derived through this insertion have compositional meanings. In the next section, I show how V-to-N and N-to-V conversion can be captured in the multi-level lexical insertion model introduced in this section.

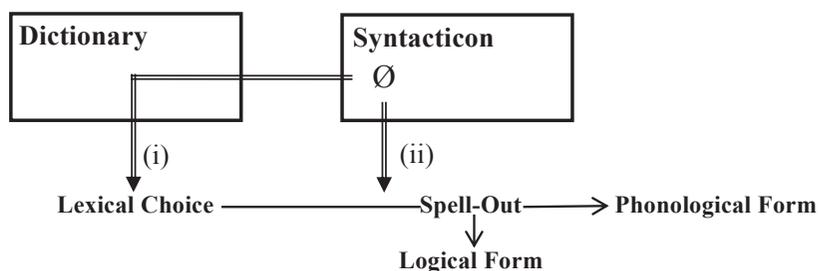
4. Proposal

4.1. *The Two Insertion Levels of Null Morphemes*

As mentioned in section 3.2, Emonds (2000) decomposes the lexicon into the Dictionary and the Syntacticon.⁷ Recall that null morphemes are assumed to be listed in the Syntacticon (Emonds (2000:119, 120)). According to this assumption, it turns out that they can in principle undergo both Deep Insertion and Syntactic Insertion. This possibility is illustrated in (13).

⁷ This section has benefited from discussions with Tatsuhiro Okubo. I would like to thank him for his insightful comments and suggestions.

(13)



Arrow (i) indicates Deep Insertion via the Dictionary and arrow (ii) Syntactic Insertion. If null morphemes can be inserted at the two different levels, then there are two types of null morphemes: the null morphemes with and those without *f*.

According to Emonds (2000), items in the lexicon have subcategorization frames in the lexical entries. This means that null morphemes also have such frames. Thus, whether null morphemes have *f* or not, they are combined with other items in syntax in accordance with their subcategorization frames. When a null morpheme is attached to a base, the resultant element has the same form with the base by definition. This is basically what happens in conversion. For instance, Emonds (2000:100, fn. 28) refers to denominal verbs such as *butter* and regards their heads as zero morphemes, along with Walinska de Hackbeil (1985). Null morphemes can also attach to verbs and change them into nouns. Note here that there are two types of null morphemes as mentioned just above. Accordingly, we need to consider which one is attached to a base in N-to-V and V-to-N conversion. The following subsections show that the null suffix without *f* derives verbs from nouns while the null suffix with *f* derives nouns from verbs.

4.2. N-to-V Conversion via Syntactic Insertion

Let us first consider the null suffix without *f*. Since both converted verbs and nouns are derived via null morphemes, we need to consider whether the null suffix without *f* derives verbs or nouns. In this regard, it is useful to consider the relationship between the productivity of affixes and that of conversion. Since the suffix without *f* undergoes Syntactic Insertion, it is a productive suffix. According to Namiki (1985:59) and Nakao (2003:112), N-to-V conversion is a very productive process. Therefore, we can assume that the null suffix without *f* derives verbs from nouns.

The examples of converted verbs are shown in (14).

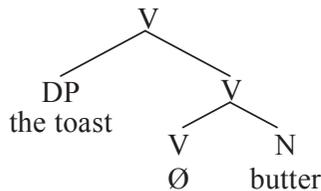
- (14) a. to butter the toast
 b. to ice the beer
 c. to air the clothes

(Emonds (2000:100, fn. 28))

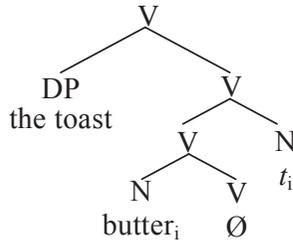
Given the discussion above, those verbs are composed of a noun and a zero-suffix without *f*. In these verbs, the zero-suffix without *f* serves as a verbalizer.

Let us then consider how a zero-verbalizer is combined with a host. Following Hale and Keyser's (2002) assumption of structures of verbs, I assume that N-to-V conversion is a process in which a nominal base is incorporated into a zero-verbalizer, which is inserted via Syntactic Insertion, as exemplified by *butter* in (15).⁸

- (15) a.



- b.



In (15a), the noun *butter* is merged with a zero-verbalizer. Then, it is incorporated into a zero-verbalizer and they form a complex verb, as represented in (15b).

4.3. *V-to-N Conversion via Deep Insertion*

Let us next turn to the null suffix with *f*. As with the case of the null suffix

⁸ The term incorporation is used here for convenience. To be precise, Hale and Keyser (2002) assumes "conflation," instead of incorporation. Conflation is a process in which a phonological feature set of the root is copied into verbal host. For a detailed discussion, see Hale and Keyser (2002:chapter 3).

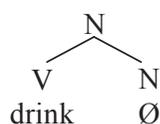
without f , we need to consider whether the null suffix with f derives verbs or nouns. As mentioned in the previous subsection, productivity is useful to determine which ones are derived via the null suffix with f . Compared to N-to-V conversion, V-to-N conversion is less productive (Namiki (1985:63), Nakao (2003:112)). Considering that the null suffix with f undergoes Deep Insertion and thus it is non-productive, we can assume that the null suffix with f derives nouns from verbs. That is, a zero-nominalizer is the null suffix which undergoes Deep Insertion and bears f .

Recall from section 3.3 that Emonds (2005) assumes that the affixes that undergoes Deep Insertion are specified in the lexical entries in their bases. Thus, in order for a zero-nominalizer to undergo Deep Insertion, the lexical entry of the base verb needs to specify that it can be a base of a zero-nominalizer, as in (16).

$$(16) \quad \textit{drink}, V, f_2, \dots, \langle _ + \emptyset_N \rangle$$

In (16), the subcategorization frame in the angle brackets (i.e. $\langle _ + \emptyset_N \rangle$) specifies that the verb can be a base of a zero-nominalizer. As a result, both of a base verb and a zero-nominalizer undergo Deep Insertion and merged together in syntax, as represented in (17).

(17)



As overviewed in section 3.4, Emonds (2000) assumes that the words derived via Deep Insertion of items in the Syntacticon (e.g. result nominals) have non-compositional meanings. In fact, the converted noun *drink* has the non-compositional meaning ‘an alcoholic drink.’ However, he does not clearly explain why such words can bear non-compositional meanings. In what follows, I discuss the process by which they have the non-compositional meanings.

In Emonds’ (2000) theory, each element in the Dictionary, which has an idiosyncratic or non-compositional meaning, bear one f in the lexical entry. Although phrasal idioms with non-compositional meanings are composed of several elements, they also have one f . For example, *to kick the bucket* does not have two independent f features that come from *kick* and *bucket*; it has one f as a whole, which represents its idiosyncratic meaning ‘die.’ Since the outputs of V-to-N conversion

also have non-compositional meanings, they should have only one f . However, the derived noun *drink* in (17) has two independent f , as represented in (18), because the items inserted via Deep Insertion have f , whether they come from the Dictionary or the Syntacticon.

$$(18) \quad \text{drink} + \emptyset_N \\ \langle f_2 \rangle \quad \langle f_3 \rangle$$

As it stands, the whole meaning of the noun *drink* consists of f of the verb *drink* and that of zero-nominalizer, and so it cannot be non-compositional. Thus, the derived nominal *drink* in (18) needs to be assigned a new f , instead of two independent f . Such features can be assigned to lexical items only in the Dictionary. Accordingly, in order for the syntactic objects in (17) to get a new f , it needs to enter the Dictionary as a lexical item. I suppose that it is implemented by Spell-Out.

To see how Spell-Out works in V-to-N conversion, let us sketch the studies by Uriagereka (1999) and Sato (2010). Uriagereka (1999) argues that if a complex syntactic object is Spelled-Out, its internal structure is destroyed and the object behaves like “a giant lexical compound,” in Uriagereka’s (1999:256) term. Adopting this model, Sato (2010) analyzes phrasal compounds in English, which raise an interesting question about the relationship between syntax and morphology. Phrasal compounds have a syntactically complex element in the non-head position, as exemplified by the compounds *an* [_{VP} *ate too much*] *headache* (Sato (2010:380); see also Lieber (1992:11)). That is, the presence of phrasal compounds indicates that phrases can occur in words, so that Lieber (1992:14) argues that they are counterexamples to the Lexicalist Hypothesis.⁹ Sato (2010:390) argues that phrasal compounds are formed by the following process. First, after the VP *ate too much* is derived, the VP undergoes Spell-Out, whereby it becomes a simplex item. Second, this simplex item is renumerated into the numeration. Finally, the simplex item is merged with *headache*, resulting in the phrasal compound *an ate too much headache*.

Sato (2010) shows that Uriagereka’s (1999) analysis can be extended to the

⁹ Lieber (1992:14) refers to this hypothesis as follows:

- (i) The Lexicalist Hypothesis (Chomsky (1970) and Lapointe (1980)) states roughly that rules of morphology and rules of syntax cannot interact.

Lieber argues that in the formation of phrasal compounds, the two types of rules interact for some degree in such a way that rules of word formation refer to phrasal elements. Therefore, such compounds are counterexamples to this hypothesis.

formation of phrasal compounds. I argue that his analysis can also be extended to conversion of verbs into nouns; a complex syntactic object composed of a verb and a zero-suffix undergoes Spell-Out, yielding a simplex lexical item. It is this simplex item that enters the Dictionary and acquires a new f .¹⁰ The assignment of a new f to a converted noun is implemented as follows:

- (19) a. When an item with f is merged with another item which also has f , the resultant syntactic object undergoes Spell-Out, whereby it loses the internal structure.
 b. The Spelled-Out object enters the Dictionary as one lexical item, and there a new lexical entry is assigned.

To see how the process works, let us now return to the conversion of the verb *drink* into a noun. As mentioned earlier, the verb *drink* is merged with a zero-nominalizer that undergoes Deep Insertion. The resultant structure has two f features, as represented by (20), repeated from (18).

$$(20) \quad \text{drink} + \emptyset_N \\ \langle f_2 \rangle \quad \langle f_3 \rangle \qquad \qquad \qquad (= (18))$$

Since both of the merged elements have f , the structure is Spelled-Out and becomes a simplex item. This simplex item is listed in the Dictionary as one lexical item. In the Dictionary, this item is assigned a lexical entry which specifies its category and meanings, as in (21).

$$(21) \quad \text{drink}, N, f_4, \dots$$

In the new lexical entry, a new f is specified. The feature f_4 in (21) represents the meaning of the converted noun *drink*, i.e. ‘a liquid for drinking’ and ‘an alcoholic drink.’ The specification of f in the lexical entry results in the non-compositional meaning of a converted noun.

To summarize this section, I proposed that zero-categorizers of N-to-V and V-to-N conversion differ in the level of insertion; a zero-verbalizer undergoes Syntactic Insertion and a zero-nominalizer Deep Insertion. I also showed the

¹⁰ Note that this point is different from Sato (2010), who argues that the Spelled-Out item is renumerated as a terminal element.

processes of N-to-V and V-to-N conversion. The former conversion is a process in which a base noun is incorporated into a zero-verbalizer. The latter conversion is a process in which a complex structure composed of a verb and a zero-nominalizer undergoes Spell-Out and the Spelled-Out item is listed in the Dictionary as one lexical item.

5. Analysis

In section 2, we saw the difference between converted verbs and nouns. They differ in that class I suffixes can be attached to converted verbs, but not to converted nouns, as shown in (22), repeated from (5).

- (22) a. *gesturation, *figurive, *patterance, *crusadatory, *cementant
 b. contractual, murderous, rebellious
- (= (5))

The contrast in (22) follows from the derivational differences between N-to-V and V-to-N conversion and the assumption that the class I suffixes in (22) are inserted via Deep Insertion. As outlined in section 3.3, in order for suffixes to undergo Deep Insertion, suffix selecting features need to be specified in their hosts. Thus, only when suffix selecting features are specified in converted items, class I suffixes can be attached to them. Below, I show that such specification is possible only in the case of V-to-N conversion based on the proposal in section 4.

Let us first examine the case of V-to-N conversion. I proposed in section 4.3 that when an item with f is merged with another item with f , the resultant structure is Spelled-Out. Accordingly, the complex structure in (23) undergoes Spell-Out, resulting in a simplex item.

- (23) $[[\text{contract}]_{V-\emptyset}]_N$
 $\langle f_5 \rangle \quad \langle f_6 \rangle$

The simplex item enters the Dictionary and there it acquires the following new lexical entry:

- (24) *contract*, N, f_7 , ..., $\langle _ +al \rangle$

I argued that by virtue of f in this new lexical entry, the converted noun bears a non-compositional meaning. Along with a semantic feature, the suffix selecting

feature $\langle _ +al \rangle$ is specified. This feature triggers Deep Insertion of the class I suffix *-al*, so that it can be merged with the noun *contract*, as shown in (25).

$$(25) \quad [[\text{contract}]_{N-al}]_A$$

Thus, since the item is sent to the Dictionary in the process of V-to-N conversion, a converted noun can be a base of class I suffixes.

In contrast, there is no way for converted verbs to bear suffix selecting features in the process of N-to-V conversion. This is because a nominal base is merged with a zero-verbalizer which undergoes Syntactic Insertion and so the resultant structure has only one f , as represented in (26).

$$(26) \quad \text{gesture} + \emptyset_V \\ \langle f_8 \rangle$$

This structure does not undergo Spell-Out. This means that the structure cannot enter the Dictionary, in which the suffix selecting feature is specified. As a result, nothing triggers the Deep Insertion of the class I suffix *-(a)tion*. Therefore, it cannot be attached to the converted verb:

$$(27) \quad * \quad [[[\text{gesture}]_{N-\emptyset}]_{V-ation}]_N$$

That is, after the word is derived through Syntactic Insertion, it is too late for a class I suffix to be attached to it.

6. Supporting Evidence

This section provides three pieces of evidence for the proposal in this paper. The first evidence supports the analysis of N-to-V conversion and the second evidence supports that of V-to-N conversion, and the third evidence supports both of them.

6.1. Instrumental Verbs

I proposed in section 4.2 that a zero-verbalizer undergoes Syntactic Insertion. Since this insertion does not take place through the Dictionary, f features are not assigned to a zero-verbalizer, unlike the case of V-to-N conversion. That is, a converted verb contains only one f whose source is the base noun, as represented in (28).

- (28) butter + \emptyset_V
 < f_9 >

If this is correct, then the converted verb should have compositional meanings in that it contains the meaning of the base noun.

The instrumental verbs in (29) show that this is the case.

- (29) a. * She taped the picture to the wall with pushpins.
 b. * They chained the prisoner with a rope.
 c. * Jim buttoned up his pants with a zipper.
 d. * Let's bicycle across France on our tricycles.

(Kiparsky (1983:11; 1997:488))

The verbs in (29) entail using the things denoted by the corresponding nouns. For example, since the verb *tape* refers to the action of using tape, it is incompatible with other instruments such as pushpins, as shown in (29a). Likewise, in order to chain, button, or bicycle, one needs to use a chain, a button, or a bicycle.¹¹ The fact that the converted verbs in (29) entail the existence of the things denoted by the base nouns shows that their meanings are compositional as expected. Therefore, converted verbs do not bear *f* features other than those of the base nouns, which means that a zero-verbalizer is not inserted via the Dictionary.

6.2. *Converted Nouns as Result Nominals*

¹¹ Kiparsky (1983, 1997) shows another type of instrumental verbs:

- (i) a. He hammered the desk with his shoe.
 b. He brushed his coat with his hand.
 c. I paddled the canoe with a board.
 d. String him up with a rope!

(Kiparsky (1997:489))

According to Kiparsky (1997), these verbs differ from the verbs in (29) in that they denote a manner of motion and one does not necessarily use the things denoted by the corresponding nouns. For example, the verb *hammer* in (ia) means “to strike with the flat side of a heavy object” (Kiparsky (1997:489)). Since a hammer is just a typical instrument used for the purpose, one can hammer something by using other instruments such as a shoe. The same holds for other verbs in (i). The sentences in (i) show that the verbs lack the meanings of the corresponding noun. Therefore, these verbs cannot be analyzed in the same way with the converted verbs in (29).

Kiparsky (1997:488, 489) distinguishes between the verbs in (i) and those in (29) and claims that the verbs in (i) are not “true denominal verbs” but “basic verbs which merely share their root with a noun.” Following his claim, I assume that the verbs in (i) used to be derived verbs as with those in (29) but are now listed in the Dictionary as basic verbs through lexicalization. I will not examine the process of lexicalization because it is beyond the scope of this paper.

I proposed in section 4.3 that in V-to-N conversion, a verbal base is Spelled-Out with a zero-nominalizer that is inserted via the Dictionary. Due to this process, the two elements become a simplex item and this is listed in the Dictionary as a simplex noun. This means that a verbal base loses verb-hood in the process of V-to-N conversion. It will be clear from two points that they lack verb-hood.

One of the characteristics shared by verbs is that verbs have argument structures. If converted nouns lose verbal characteristics, they should lack such structures. That is, it is predicted that converted nouns cannot select arguments that their base verbs can select. This prediction is borne out. Shimamura (2009) shows that converted nouns that she calls “zero-derived nominals” are incompatible with the arguments, as shown in (30).

- (30) a. * their drink of much wine
b. * John’s reject of her offer

(Shimamura (2009:112))

In (30), the converted nouns *drink* and *reject* cannot co-occur with the arguments that their verbal counterparts may select (i.e. *much wine* and *her offer*).

The absence of verb-hood in converted nouns is also shown by their semantic characteristics. For example, the converted nouns in (30) do not have eventive or process meanings. Instead, they refer to concrete objects; the noun *drink* in (30a) refers to ‘a liquid for drinking’ or ‘alcoholic drink,’ and the noun *reject* in (30b) ‘a thing or person that is rejected.’ Other examples of converted nouns also refer to concrete entities (see also Shimamura (1990)):

- (31) an award, a cook, a crumble, a guide, a meet, the open, a refill, a smear
(Shimamura (2009:111-112), with slight modifications)

These facts indicate that converted nouns lose the verbal meanings, which supports the proposal in this paper.

Notice that the properties of the converted nouns are in common with those of result nominals. That is, converted nouns and result nominals do not have argument structures and both of them refer to concrete entities. Section 3.4 showed that the result nominal *development* refers to a concrete object and is incompatible with the PP that is selected by the verbal base *develop*, as shown in (32a) and (32b), repeated from (10a) and (11).

- (32) a. We protest the city's three treeless developments with no schools.
(= (10a))
b. We protest the city's three (*contrast) developments (*into the hills).
(= (11))

These properties are in parallel with those of converted nouns. Based on the facts mentioned above, Shimamura (2009) argues that the converted nouns are result nominals.¹² Recall from section 3.4 that the suffixes of result nominals are assumed to be inserted via the Dictionary. This is also consistent with the proposal that a zero-nominalizer undergoes Deep Insertion.

6.3. Conversion and Two Types of Verb-Particle Combinations

The third piece of evidence is based on Naya's (2013) analysis of verb-particle combinations (VPCs). Generally, there are two types of VPCs: aspectual VPCs as in (33) and idiomatic VPCs as in (34).¹³

- (33) a. John drank up the beer. (McIntyre (2004:546))
b. Greg cleaned up the car. (Dehé (2002:6))
(34) a. Mikey looked up the reference. (Johnson (1991:593))

¹² Shimamura (2009) points out that there are cases in which converted nouns behave as complex event nominals. For example, she cites the following examples from the *Corpus of Contemporary American English*:

- (i) a. The agency's change of immediate focus to an orbital space plane has left the fate of that vehicle in the air.
b. The man slowly shakes his head 'no' to Schindler's offer of a cigarette.
c. ... the administration's use of this emergency power...

In each case, the external and internal arguments which are selected by the base verbs are syntactically realized (compare (ib) to *Schindler offers a cigarette*, for example). This indicates that the underlined nouns in (i) are complex event nominals. Shimamura (2009) observes that not all converted nouns can behave as complex event nominals and that the acceptability of converted nouns as complex event nominals differs among speakers. Based on this observation, she argues that a converted noun as a complex event nominal is licensed by frequency. That is, Shimamura does not regard a converted noun which behaves as a complex event nominal as a product of a rule-governed process. However, the multi-level lexical insertion model predicts the existence of such converted nouns. This is because a zero-nominalizer in the Syntacticon has two possibilities for insertion in principle: Deep Insertion and Syntactic Insertion. If it undergoes Syntactic Insertion, then the converted noun should behave as a complex event nominal, along with the case of overt nominalization (cf. section 3.3). Thus, the process of deriving a converted noun as a complex event nominal is rule-governed and the noun is a possible word. Whether or not the possible word is actually used may depend on frequency. I will not go further into the question of why there is a case in which a zero-nominalizer undergoes Syntactic Insertion.

¹³ For the classification of VPCs, I follow Emonds (1985), Dehé (2002), Jackendoff (2002), and Thim (2012), among others.

- b. John coughed up the money. (Los et al. (2012:17))

These two types show some differences. One of them is concerned with semantic compositionality. The aspectual VPCs in (33) *drink up* and *clean up* have compositional meanings in that the particle *up* adds the meaning of ‘completion’ to those of the verbs. By contrast, the idiomatic VPCs in (34) *look up* and *cough up* have non-compositional meanings in that their meanings cannot be attributed to their parts.

In order to account for the differences between aspectual and idiomatic VPCs, Naya (2013) argues that particles are functional categories and are listed in the Syntacticon. If so, particles can be inserted at different levels. In fact, Naya suggests that Syntactic Insertion of particles results in aspectual VPCs and Deep Insertion of them in idiomatic VPCs.

If the particles of aspectual and idiomatic VPCs are inserted at different levels as Naya (2013) suggests, then they differ in the feature composition. That is, the particles of aspectual VPCs lack *f* but those of idiomatic VPCs have the feature, as illustrated in (35a) and (35b), respectively.

- (35) a. drink + up
 $\langle f_2 \rangle$
 b. look + up
 $\langle f_{10} \rangle$ $\langle f_{11} \rangle$

Given the proposal in this paper shown in (36), repeated from (19a), only idiomatic VPCs undergo Spell-Out when the verb and the particle are merged.

- (36) When an item with *f* is merged with another item which also has *f*, the resultant syntactic object undergoes Spell-Out, whereby it loses the internal structure. (= (19a))

After Spell-Out, the derived item is listed in the Dictionary as one lexical item and assigned one *f*, as illustrated in (37).

- (37) look + up \Rightarrow look up
 $\langle f_{10} \rangle$ $\langle f_{11} \rangle$ $\langle f_{12} \rangle$

The “giant lexical compound” *look up* can, in turn, undergo Deep Insertion.

If idiomatic VPCs are listed in the Dictionary by virtue of the process in (36), it turns out that a zero-nominalizer can be attached to them. Since the zero-nominalizer also has feature f , the syntactic object resulting from the merge should have two independent f features. The proposal in (36) predicts that this structure must be Spelled-Out. In other words, if the proposal in (36) is correct, then it is predicted that idiomatic VPCs can be converted into nouns. This prediction is borne out, as shown in (38).

- (38) a. a look-up ‘information retrieval’
 b. a break-out ‘forcible escape (from prison)’
 c. a fill-in ‘substitute’
 d. a wind-up ‘an attempt to tease or irritate someone’
- (Miller (2013), with modifications)

Although idiomatic VPCs can be converted into nouns, aspectual VPCs cannot be inputs of V-to-N conversion, as exemplified in (39).

- (39) a. * a drink-up (of water)
 b. * a chew-up (of food)
 c. * a finish-up (of the work)
 d. * an eat-up (of food)
- (Miller (2013:35))

The ungrammaticality of the examples in (39) follows from the feature composition of aspectual VPCs. Since the particles of aspectual VPCs lack f as shown in (35a), aspectual VPCs do not undergo Spell-Out. As a result, particles without f prevent the two items with f (i.e. verbs and a zero-nominalizer) from directly combining. Therefore, aspectual VPCs cannot be converted into nouns.

Given the discussion above, we can make a prediction about the VPCs which may serve as both aspectual and idiomatic; if such an ambiguous VPC is converted into nouns, then the converted noun is predicted to have an idiomatic interpretation. To see whether or not this prediction is borne out, take the VPCs *shake up* and *wrap up* for example.

First, let us observe the following sentences:

- (40) a. Don’t shake up the bottle.
 b. The management aims to shake up the company.

(*Collins Cobuild Phrasal Verbs Dictionary*)

- (41) Bank officials also announced a shakeup in that unit late today.

(*Corpus of Contemporary American English*)

The VPC *shake up* is ambiguous in that it has the aspectual meaning ‘to shake completely’ as in (40a), and the idiomatic meaning ‘to reorganize’ as in (40b). Since only idiomatic VPCs undergo V-to-N conversion, the converted noun should have the meaning related to *shake up* in (40b). This is, in fact, the case. The converted noun *shakeup* in (41) means reorganization of some sort of unit in a bank.

The same holds for the VPC *wrap up*, as shown in the following examples:

- (42) a. He had wrapped up his parcel of his papers and a few books.

(*Collins Cobuild Phrasal Verbs Dictionary*)

- b. I’ll also wrap up a few major themes of the book.

(Robert Galen, *Software Endgames: Eliminating Defects, Controlling Change, and the Countdown to On-Time Delivery*)

- (43) Stay tuned to CBS [...] for a complete wrap-up on the evening news.

(*Corpus of Contemporary American English*)

The VPC *wrap up* means ‘to cover completely’ in (42a) and ‘to summarize’ in (42b). As we predicted, this ambiguity is resolved when the combination is converted. In (43), the converted noun *wrap-up* means ‘summary,’ which clearly shows that the noun is derived from the idiomatic type of *wrap up*.

In this subsection, I showed that the idiomatic VPC, which is derived via the Dictionary, can be converted into nouns, unlike the aspectual VPCs. The data presented above demonstrate that in order for a zero-nominalizer to be attached and derive a noun, its host needs to have one *f*. If an element without *f* exists, the structure is not Spelled-Out, hence resulting in the failure of V-to-N conversion.

7. Implication

In section 4.3, I proposed that when an item with *f* is directly merged with another item that also has *f*, the resulting structure undergoes Spell-Out. As a result of this process, the Spelled-Out object becomes one lexical item. We have seen that such a process is applied to a structure consisting of a lexical item in the Dictionary and an item previously listed in the Syntacticon. This does not entail that one of the constituents must be an item from the Syntacticon. It is indeed possible that two lexical items from the Dictionary can be directly combined

together. In other words, this process forms a compound and assigns an unpredictable meaning to the compound. Morita (2003:602) points out that Emonds' (2000) theory fails to capture idiosyncratic meanings of compounds, because they are formed in syntax. According to him, it is not clear why the compound *snow-man*, for example, acquires its idiosyncratic meaning 'man who is made from snow' in syntax. However, given the proposal in this paper, non-compositionality of the meanings of compounds is a natural consequence of merging items that bear *f*. For example, the meaning of the *snow-man* is assigned by the following process:

$$(44) \quad \text{snow} + \text{man} \Rightarrow \text{snow-man} \\ \langle f_{13} \rangle \quad \langle f_{14} \rangle \quad \quad \langle f_{15} \rangle$$

First, as the left-side of the arrow in (44) shows, both of *snow* and *man* have their own *f*, because they come from the Dictionary. Second, items with *f* are directly merged, so that the operation Spell-Out is applied to the resulting structure. As the result of this process, the complex structure loses its structure, forming the compound *snow-man*. As shown in the right-side of the arrow in (44), *f* is newly assigned to this compound, whereby the non-compositional meaning is specified.

The discussion above implies that a phrase contains functional elements which prevent items with *f* from being directly combined. It is likely that this structural property is related to the distinction between phrases and words. However, it is beyond the scope of this paper to examine how they are structurally different, so that I leave it for future research.

8. Conclusion

In this paper, I showed that N-to-V and V-to-N conversion share the category-changing function, but they are different in that their outputs behave differently to class I suffixation. In order to capture this fact, adopting Emonds' (2000, 2005) model, I proposed that a zero-verbalizer undergoes Syntactic Insertion and a zero-nominalizer Deep Insertion. Based on this proposal, I argued that N-to-V conversion is a process in which nouns are incorporated into a zero-verbalizer. I also argued that the process of V-to-N conversion proceeds as follows: When a verb is directly merged with a zero-nominalizer with purely semantic features *f*, the syntactic object undergoes Spell-Out and is listed in the Dictionary as a simplex noun. That is, the processes of the two types of conversion are different from each other although both of them have the category-changing

function. Therefore, it is because of the differences in their processes that N-to-V and V-to-N conversion show different behavior.

REFERENCES

- Allen, Margaret (1978) *Morphological Investigations*, Doctoral dissertation, University of Connecticut.
- Baker, Mark (1988) *Incorporation: A Theory of Grammatical Function Changing*, University of Chicago Press, Chicago.
- Chomsky, Noam (1970) "Remarks on Nominalization," *Readings in English Transformational Grammar*, ed. by Roderick A. Jacobs and Peter S. Rosenbaum, 184-221, Ginn, Waltham, MA.
- Dehé, Nicole (2002) *Particle Verbs in English: Syntax, Information Structure and Intonation*, John Benjamins, Amsterdam.
- Emonds, Joseph E. (1985) *A Unified Theory of Syntactic Categories*, Foris, Dordrecht.
- Emonds, Joseph E. (2000) *Lexicon and Grammar: The English Syntacticon*, Mouton de Gruyter, Berlin.
- Emonds, Joseph E. (2001) "The Flat Structure Economy of Semi-lexical Heads," *Semi-lexical Categories*, ed. by Norbert Corver and Henk van Riemsdijk, 23-66, Mouton de Gruyter, Berlin.
- Emonds, Joseph E. (2005) "The Computational Lexicon," *English Linguistics* 22, 232-266.
- Grimshaw, Jane (1990) *Argument Structure*, MIT Press, Cambridge, MA.
- Hale, Kenneth and Samuel Jay Keyser (2002) *Prolegomenon to a Theory of Argument Structure*, MIT Press, Cambridge, MA.
- Halle, Moris and Alec Marantz (1994) "Some Key Features of Distributed Morphology," *MIT Working Papers in Linguistics* 21, 275-288.
- Ito, Takane and Yoko Sugioka (2002) *Go-no Sikumi-to Gokeisei* (Structure of Words and Word Formation), Kenkyusha, Tokyo.
- Jackendoff, Ray (2002) "English Particle Constructions, the Lexicon, and the Autonomy of Syntax," *Verb Particle Explorations*, ed. by Nicole Dehé, Ray Jackendoff, Andrew McIntyre and Silke Urban, 67-94, Mouton de Gruyter, Berlin.
- Johnson, Kyle (1991) "Object Positions," *Natural Language and Linguistic Theory* 9, 577-636.
- Kiparsky, Paul (1982) "Lexical Morphology and Phonology," *Linguistics in the Morning Calm: Selected Papers from SICOL-1981*, ed. by In-Seok Yang, 3-91, Hanshin Publishing Company, Seoul.
- Kiparsky, Paul (1983) "Word Formation and the Lexicon," *Proceedings of the 1982 Mid-American Linguistic Conference*, ed. by Frances Ingemann, 3-29, University of Kansas.
- Kiparsky, Paul (1997) "Remarks on Denominal Verbs," *Complex Predicates*, ed. by Alex Alsina,

- Joan Bresnan, and Peter Sells, 473-499, CSLI Publications, Stanford.
- Lapointe, Steven (1980) *A Theory of Grammatical Agreement*, Doctoral dissertation, University of Massachusetts.
- Lieber, Rochelle (1992) *Deconstructing Morphology: Word Formation in Syntactic Theory*, University of Chicago Press, Chicago.
- Lieber, Rochelle (2005) "English Word-Formation Processes: Observations, Issues, and Thoughts on Future Research," *Handbook of Word-Formation*, ed. by Pavol Štekauer and Rochelle Lieber, 375-427, Springer, Dordrecht.
- Los, Bettelou, Corrien Blom, Geert Booij, Marion Elenbaas, and Ans van Kemenade (2012) *Morphosyntactic Change: A Comparative Study of Particles and Prefixes*, Cambridge University Press, Cambridge.
- Marchand, Hans (1969) *The Categories and Types of Present-Day English Word-Formation: A Synchronic-Diachronic Approach*, 2nd Edition, C. H. Beck'sche, Munich.
- McIntyre, Andrew (2004) "Event Paths, Conflation, Argument Structure, and VP Shells," *Linguistics* 42, 523-571.
- Miller, Gary D. (2013) "On the History and Analysis of V-P Nouns," *Historical Word-Formation and Semantics*, ed. by Jacek Fisiak and Magdalena Bator, 31-58, Peter Lang, Frankfurt am Main.
- Morita, Junya (2003) "The Lexicon-Syntax Interface," (Review Article: *Lexicon and Grammar: The English Syntacticon*, by Joseph E. Emonds, Mouton de Gruyter, Berlin, 2000), *English Linguistics* 20, 584-608.
- Nakao, Toshio (2003) *Henka Suru Eigo* (Variation and Change in Contemporary English), Hituzi Syobo, Tokyo.
- Namiki, Takayasu (1985) *Gokeisei* (Word Formation), Taishukan, Tokyo.
- Naya, Ryohei (2013) *The Nature of Semi-Lexical Categories and Prepositional Elements in English*, MA thesis, University of Tsukuba.
- Sato, Yosuke (2010) "Complex Phrase Structure within Morphological Words: Evidence from English and Indonesian," *Lingua* 120, 379-407.
- Scalise, Sergio (1984) *Generative Morphology*, Foris Publications, Dordrecht.
- Shimamura, Reiko (1990) *Eigo no Gokeisei to Sono Seisansei* (English Word-Formation and Its Productivity), Liber Press, Tokyo.
- Shimamura, Reiko (2009) "Eigo no Meishika ni okeru Fukuzatsu Jishomeishi to Kekkameishi ni tsuite (Complex Event Nominals and Result Nominals in English Nominalization)," *Tsudajuku Daigaku Kiyō* 41, 97-134.
- Siegel, Dorothy (1974) *Topics in English Morphology*, Doctoral dissertation, MIT.
- Thim, Stefan (2012) *Phrasal Verbs: The English Verb-Particle Construction and Its History*, Mouton de Gruyter, Berlin.

Uriagereka, Juan (1999) "Multiple Spell-Out," *Working Minimalism*, ed. by Samuel David Epstein and Norbert Hornstein, 251-282, MIT Press, Cambridge, MA.

Walinska de Hackbeil, Hanna (1985) "En- Prefixation and the Syntactic Domain of Zero Derivation," *Proceedings of the 11th Annual Meeting of the Berkeley Linguistics Society*, 337-357, Berkley Linguistics Society, Berkley.

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