A Study on Semi-lexical Categories in Word-Formation in English and Japanese

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List of Abbreviations

A	Adjective	Nom	Nominative
AN	Adjectival Noun	P	Preposition
Acc	Accusative	Part/Prt	Particle
Adv	Adverb	Past	Past tense
AR	Alternative Realization	PF	Phonological Form
Cop	Copula	Quot	Quotative
Dat	Dative	RHR	Right-Hand Head Rule
Gen	Genitive	Stat	State
Infl	Inflection	Top	Topic
LF	Logical Form	UG	Universal Grammar
Mim	Mimetic	V	Verb
N	Noun	VN	Verbal Noun

Chapter 1

Introduction

1.1. Syntactic Categories in Natural Language

Since the very beginning of the study of language(s), linguists have recognized that words or lexical items can be classified into two groups: content words and function words. Generative Grammar assumes two syntactic categories, lexical categories and functional categories, roughly corresponding to content words and functional words. Generally speaking, the two categories can be distinguished based on certain contrastive properties. A number of such properties have been identified so far, as summarized by Corver and van Riemsdijk (2001a), with one striking example relating to semantic content. Lexical categories have a concrete semantic content. They can be further divided into four major categories, nouns (N), verbs (V), adjectives (A), and prepositions (P) (e.g., Chomsky (1970), Stowell (1981)). In contrast to lexical categories, functional categories bear abstract meanings, as they primarily perform grammatical functions by marking, for example, "tense, modality, definiteness, number, degree, [and] interrogativity" (Corver and van Riemsdijk (2001a: 1)). They "glue the content words [or lexical categories] together, to indicate what goes with what and how" (Corver and van Riemsdijk (2001a: 1)). Representative examples are D and I (or T), which are responsible for definiteness and tense in grammar, respectively. Previous studies have clarified characteristics distinguishing the two categories; this has made the distinction more precise, thereby contributing to our understanding of natural language.

Research on questions relating to syntactic categories, however, has also discovered a third type of category: Itmes in this category behave like a lexical category in some respects and like a functional category in others. This in-between category is termed a "semi-lexical category" (Corver and van Riemsdijk (2001b); cf. van Riemsdijk (1998), Emonds (1985, 2000,

2001)). Emonds (1985, 2000, 2001), for example, argues that nouns, verbs, adjectives and prepositions, generally classified as lexical categories, fall under the semi-lexical category when they have properties characteristic of functional categories. Emonds (1985: 162) roughly characterizes them as "comprised of the most frequently used and least semantically specific members of each category." They also show different syntactic behaviors from those of other ordinary lexical categories (partially) due to the lack of semantic specificity. For example, semi-lexical nouns include *one*, *thing*, *place*, *time*, and *body*, among others. These nouns can be combined with quantifiers such as *every*, *some*, *any*, and *no*, yielding complex pronouns such as *everything*, *someone*, *anybody*, *no place* (Emonds (1985: 162, 204)). The complex pronouns behave like quantifiers, which fall under a class of functional categories, rather than like lexical nouns; for instance, they obligatorily precede simple adjectives, as shown in (1), as is the case with quantifiers, as in (3), but not with compound nouns, as in (2).

(1) a. Somebody clever is invited.
b. * Clever somebody is invited.

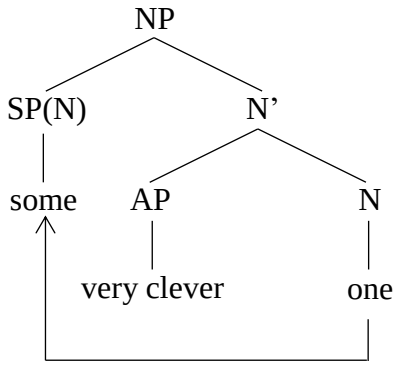
(2) a. * Housemates clever can be fun.
b. Clever housemates can be fun.

(3) a. Some clever fellows are invited.
b. * Clever some fellows are invited.

(Emonds (1985: 204), with slight modifications)

Emonds (1985) accounts for this distribution by arguing that the nouns *one*, *thing*, *place*, *time*, and *body* undergo a syntactic operation applied only to functional items, as indicated in (4) (cf. Kishimoto (2000)).

(4) someone very clever



(Emonds (1985: 207), with slight modifications)

Note that the nouns can stay to the right of adjectives, as shown in (5).

(5) a. every interesting thing

b. some delicious thing

c. some cold place

(Kishimoto (2000: 562))

In these examples, however, the nouns have concrete meanings. For example, the noun *thing* here "refers to a concrete entity or denotes a specific class name" (Kishimoto (2000: 563)). That is, the nouns in (5) are normal nouns, which do not undergo the syntactic operation in (4). Given these examples, the lack of specific meanings can be regarded as a typical feature of semi-lexical elements.

It has also been observed that certain semi-lexical items can be silent (see Corver (2008), Shimada (2013); cf. Panagiotidis (2003), Kayne (2005, 2007), Watanabe (2012), Harves and Myler (2014)). Harves and Myler (2014), for example, posit the existence of silent elements in context, as in (6).

(6) John has yet to eat dinner. (Harves and Myler (2014: 213))

In this example, the negative polarity item *yet* occurs and must be licensed by an appropriate element. However, the sentence does not contain a visible licenser. Harves and Myler (2014) propose that *yet* is licensed by a phonologically null past participle *FAILED*, as represented by (7).

(7) John has yet FAILED [$_{TP}$ <John> to eat dinner <yet>].

(Harves and Myler (2014: 214))

This analysis convincingly demonstrates the existence of silent elements and clarifies their roles in phrases.

Various studies have tried to shed light on the properties of semi-lexical categories, but these categories remain poorly understood, particularly when compared with regular lexical and functional categories. Semi-lexicality, in this sense, is at the frontier of research in the system of syntactic categories, thus requiring further research. Corver and van Riemsdijk (2001a: 10) give various questions that should be addressed in the study of semi-lexical categories. Some of these are the following:

(8) a. What types of semi-lexical nouns, verbs, adjectives and prepositions can be distinguished?

b. What distinguishes them from truly grammatical functors?

c. Is this distinction expressed in terms of their lexical feature-composition, and if so, what features are involved?

d. How do they combine in syntactic structure and how do they project

syntactically?

(Corver and van Riemsdijk (2001a: 10))

The papers collected in Corver and van Riemsdijk (2001b) independently study semi-lexical categories and answer questions like these from various viewpoints. Unfortunately, there are poorly explored areas left on the frontier we are attempting to examine. Firstly, numerous studies have focused on semi-lexical elements in the context of phrase formation, but (to my knowledge) very little attention has been paid to them regarding word-formation (except for a few studies such as Shimada (2013)). It is not enough to focus on the phrasal level when studying semi-lexical categories, because there should be semi-lexical items that can only be identified by exploring the field of word-formation. Secondly, another unexplored field is related to the language types that have been investigated in the literature. Previous studies have mostly concerned European languages. Non-European languages like Japanese are thus new fields in the study of semi-lexical categories. Given the variability of lexical categories in languages, it is desirable to advance the study to encompass a wide range of languages in order to broaden our knowledge of semi-lexical categories in natural language. For instance, Japanese has two lexical categories that are not found in European languages: verbal nouns and adjectival nouns (Shibatani (1990)). These categories, as will be demonstrated in this thesis, should not be overlooked in the study of semi-lexical categories. Finally, while previous studies independently assume semi-lexical categories (and elements virtually equivalent to them) to capture various phenomena, they have not satisfactorily provided a general or systematic view of the categories. We need to take these aspects into consideration to further understand syntactic categories in natural language.

1.2. Aims

Hoping to contribute to a better understanding of semi-lexical categories, this thesis aims to clarify ceratin of their aspects. Specifically, we seek answers to the following questions by focusing on morphological phenomena in English and Japanese including prefixation, compounding, and nominalization:

(9) a. What lexical items can be classified as semi-lexical categories?

b. What roles do they play in grammar, especially in morphology?

c. What status do they have in the grammar system?

We will address these questions based on the framework of the Bifurcated Lexical Model proposed by Emonds (2000, 2002, 2005). The model offers a unified way of analyzing semi-lexical categories. The model contains two main hypotheses. Firstly, it hypothesizes that the Lexicon is composed of two subcomponents, the Dictionary and the Syntacticon. The former contains the four lexical categories N, V, A, and P, and the latter functional categories. Importantly, it is the Syntacticon that contains semi-lexical categories. Semi-lexical categories here can be regarded as lexical items that have the category N, V, A, or P but are semantically light. Secondly, the model hypothesizes Multi-Level Lexical Insertion, according to which the Syntacticon can feed its items, including semi-lexical items, to syntax at three different stages during the derivation. The combination of these two hypotheses, together with additional assumptions, gives semi-lexical categories a stable place in the grammar system, answering the questions in (8).

Within this model, this thesis will identify additional examples of the semi-lexical items as defined in Emonds (2000) by investigating complex words in English and Japanese. In addition, this thesis will propose a new type of semi-lexical categories that was not

hypothesized in Emonds (2000). This thesis shows how both types of semi-lexical categories are involved in morphological processes especially in terms of the relationship with syntactic computation.

In so doing, we will also deal with relevant issues that have been discussed in the study of morphology. They are concerned with the distinction among morphological processes, the headedness in complex words, and the competition in word-formation, as summarized in (10).

(10) a. How are the three morphological processes, namely, derivation, compounding, and inflection (and their resultants), distinguished from one another?

b. Which constituent in a complex word functions as the head?

c. Under what conditions do word-formations compete with each other?

The notion of semi-lexical categories sheds new light on these questions.

1.3. Organization

This thesis is organized as follows. Chapter 2 outlines the theoretical framework, the Bifurcated Lexical Model, based on Emonds (2000, 2001, 2002, 2005), and introduces the two main hypotheses briefly mentioned above. It also provides definitions of lexical, functional, and semi-lexical categories. In particular, it elaborates the notion of semi-lexicality and semi-lexical categories. It will be shown that "semi-lexicality" can be reinterpreted as "secondary membership" in the lexical component. Under the Bifurcated Lexical Model, which assumes two lexical components (i.e., the Dictionary and the Syntacticon), we can assume that not only the Syntacticon but also the Dictionary involve semi-lexical categories.

Chapters 3 and 4 provide additional examples of semi-lexical categories in the

Syntacticon. Chapter 3 investigates prefixation in English, showing that it can be resolved into compounding and an inflection-like process. The inflection-like prefixation employs semi-lexical Ps, which bear aspectual or negative meanings. Chapter 4 analyzes transparent compounds in English, which are apparently headed by a left-hand constituent with respect to argument-selection (Toman (1986)). It is argued that apparently left-headed compounds are headed by semi-lexical nouns. This chapter extends this analysis to V-V compounds in Japanese and identifies several verbs as semi-lexical Vs in the Syntacticon.

Chapters 5 and 6 provide evidence for the semi-lexical categories that are not assumed in Emonds (2000), namely, semi-lexical categories in the Dictionary. Chapter 5 examines whether result nominals are derived from complex event nominals (Grimshaw (1990)) or not. This chapter argues that the two types of nominals are independently formed based on empirical data drawn mainly from the *Oxford English Dictionary*. Elaborating Emonds' (2000) analysis, the proposed analysis assumes that certain nominal suffixes, which originally reside in the Syntacticon, can be turned into Dictionary items when they form result nominals. Such nominal suffixes in the Dictionary can be counted as semi-lexical elements in the Dictionary under the revised notion of semi-lexicality. In addition, extending Shimada's (2013) analysis, this chapter also proposes that English and Japanese deverbal converted nouns are headed by silent nouns from the Dictionary, which are another type of semi-lexical category in the Dictionary. Chapter 6 provides independent evidence for the existence of silent semi-lexical elements in the Dictionary by demonstrating that they play a crucial role in forming a certain kind of complex word in Japanese. This chapter is important for the question in (8a) in particular, because it identifies semi-lexical items other than N, V, A, and P.

Chapter 7 summarizes this thesis and offers concluding remarks.

Chapter 2

Theoretical Framework

2.1. Introduction

This chapter outlines the theoretical framework of this thesis, which is called the Bifurcated Lexical Model.[1] The framework was first proposed in Emonds (2000) and has been elaborated in his subsequent works (Emonds (2001, 2002, 2005, 2016)). Its outstanding feature is its two basic hypotheses. Firstly, the model, as its name suggests, hypothesizes that the Lexicon consists of two subcomponents that are called the Dictionary and the Syntacticon. The two components supply secure places in grammar not only for the traditionally recognized categories (i.e., lexical and functional ones), but also for semi-lexical categories. The bifurcation of the Lexicon leads to the second hypothesis, called Multi-level Lexical Insertion, whereby the two subcomponents of the Lexicon interact with syntactic computation differently. Whereas the Dictionary inserts lexical items only before syntactic computation, the Syntacticon can feed lexical items to syntax several times during the computation. Under the two basic hypotheses, the notion of headedness can be redefined. In addition, they clarify the distinctions among the three basic morphological processes, compounding, derivation, and inflection.

This chapter is organized as follows. Section 2.2 introduces three types of lexical items stored in the Lexicon, lexical, functional, and semi-lexical categories. Section 2.3 shows how phrase structures are formed independently of individual lexical items. Section 2.4 outlines the fundamental hypothesis of Emonds' (2000) framework, that is, the Bifurcated Lexical Model, whereby the Lexicon is decomposed into two subcomponents, the Dictionary and the Syntacticon. Section 2.5 introduces another basic hypothesis: Multi-level Lexical Insertion.

[1] See Morita (2003) for a review of Emonds (2000).

Under the hypothesis, there are three types of lexical insertion from the Syntacticon, which take place at different stages of the syntactic computation. They are illustrated in Sections 2.5.3 and 2.5.4 based on examples of nominalization and inflection. In so doing, the notion of headedness is redefined. Section 2.8 summarizes this chapter.

2.2. Lexical, Functional, and Semi-lexical Categories

This section introduces the basic ingredients for syntactic computation that are stored in the Lexicon. As with other general theories in Generative Grammar, Emonds' (2000) model assumes two types of syntactic categories in the lexical inventory: lexical categories and functional categories. Lexical categories, which consist of nouns, verbs, adjectives, and prepositions (N, V, A, P), constitute the major portion of the inventory. Emonds (2000: 5) assumes the following structural restriction on lexical categories X: each of the four lexical categories X "has a 'maximal projection XP' which obligatorily contains ('dominates') its structural head X as well as any modifiers and complements which may modify X."

Functional categories, which are limited in number, mainly function to "modify and help extend the projections of the lexical categories." They are well represented by I and D. The former forms an extended projection IP of V and the latter an extended projection DP of N. In addition, functional categories include the elements modifying (at least) the four lexical categories X. Emonds (2000) uses the term specifier SPEC(XP) for them. SPEC(AP), for example, contains degree words like *very* and *so* (Emonds (2000: 6)).

We now obtain the following property of Universal Grammar (UG) concerning syntactic categories:

(1) UG provides a restricted set of morpheme categories {B}: lexical heads X, specifier SPEC(XP), I, D and perhaps a few others. (Emonds (2000: 6))

Lexical and functional categories are distinguished from each other by the feature contents in their lexical entries. Emonds (2000) assumes two types of features: purely semantic features *f* and cognitive syntactic features F. They are defined as follows:

(2) a. Purely semantic features *f*, which are present *only* on the head categories X = N, V, A and P. They are not used in syntax and are not present on closed subclasses of grammatical X.

b. Cognitive syntactic features F in canonical positions, which can occur with all syntactic categories. They play a central role in both syntax and at Logical Form.

(Emonds (2000: 12))

As defined in (2a), purely semantic features *f* are present only on the lexical head categories N, V, A, and P. They contribute to finer distinctions of meaning outside of syntax; namely, they play no role in syntax. In contrast, cognitive syntactic features can occur with all syntactic categories and play a central role in syntax.[2] Thus, the purely semantic features *f* distinguish lexical categories from functional categories, as formalized in (3).

(3) Outside the lexical categories N, V, A and P, the only features allowed are the cognitive syntactic features F (and the small sets of morphemes they generate).

(Emonds (2000: 9))

Importantly, not every N, V, A, and P *must* have purely semantic features *f*. Emonds (2000: 9) states that each of the categories "*has a subset of say up to twenty or so elements fully*

[2] The term "canonical positions" in (2b) will be explained in Section 2.5.1.

characterized by cognitive syntactic features F and entirely lacking purely semantic features f" (italics original) (see also Emonds (1985)). These subsets are called *grammatical* N, V, A, and P in Emonds (2000). In addition to this term, Emonds (2001) uses the label *semi-lexical* for the subsets:

(4) Semi-lexical Categories

Semi-lexical heads (= grammatical heads) are those N, V, A, and P which have no purely semantic features *f*. (Emonds (2001: 29))

Semi-lexical categories can be roughly characterized as being "comprised of the most frequently used and least semantically specific members of each lexical category" (Emonds (1985: 162)). Emonds (2000: 9) gives the following examples of semi-lexical N and V:

(5) a. Semi-lexical N

one, self, thing, stuff, people, other(s), place, time, way, reason, etc.

b. Semi-lexical V

be, have, do, get, go, come, let, make, say, etc.

(Emonds (2000: 9))

Note that semi-lexical N, V, A, and P can be grouped together with functional categories in that both of them lack purely semantic features *f*. Functional (or grammatical) categories can thus be defined as follows:

(6) A closed grammatical class X (including N, V, A, P) is one whose members have no purely semantic features *f*, but only cognitive syntactic features F.

(Emonds (2000: 9))

Importantly, the definition in (6) does not involve the distinction between free and bound morphemes; namely, the boundness of a given lexical item does not indicate its functional status. In this regard, Emonds (2000: 97, 107, 110) points out that stems used in neoclassical compounds (e.g., *mega-*, *multi-*, *-holic*, *-hood*, *-phile*) have specific semantic content (see also Yoshioka (2011)). This means that although they are bound forms, they can be characterized by their own purely semantic features *f*. Accordingly, the definition in (6) classifies the combining forms not as grammatical but as lexical categories (see also Nagano (2013a: Section 4)).

Based on these two types of features, the lexical entries of lexical and functional categories can be formally expressed as in (7), where @ represents a selecting head, and +__F a subcategorization frame, and subscripts are indices (see Emonds (2000: 43)).

(7) a. Lexical Categories:

@, X, F_i, f_j, +__F_k

b. Functional Categories (including Grammatical N, V, A, P):

@, X, F_l, +__F_m

For example, the psych verb *amuse* and the agentive suffix *-er* have the following lexical entries:

(8) a. amuse, V, *f*, +__ANIMATE (Emonds (2000: 47), with a modification)

b. er, N, ANIMATE, +<[V, ACTIVITY]__>

(Emonds (2000: 157, with a modification))

The lexical entry in (8a) means that the head *amuse* has the categorial feature V and a purely semantic feature *f* (thus, *amuse* is a lexical category), and takes a complement if it intrinsically has the cognitive syntactic feature [ANIMATE]. Likewise, the lexical entry in (8b) indicates that *-er* has the features N and [ANIMATE] and attaches to the verbs with the feature [ACTIVITY].

As indicated in the lexical entries in (8), the combinatorial relationship between a head and its complement is encoded only by the frame +__F. Emonds (2000: 42) assumes that this frame does not mention phrases (i.e., not +__DP but +__D, for example), conflating word-internal and phrasal subcategorization.

While the co-occurrence properties of the categories and features are partially regulated by lexically specified co-occurrence frames, they are also governed by a universal theory of phrase structure that is introduced in the next section.

2.3. A Theory of Phrase Structure

As a general theory of the way lexical items are combined, Emonds (2000) adopts X-bar theory, which hypothesizes that lexical categories X are projected up to form non-maximal and maximal projections, which are represented by the notations X' and XP, respectively. XP structurally contains SPEC(XP), which is the position for the modifier of the head X and the subject DP of VP. This can be formalized as follows:

(9) Lexical category heads X together with their complements and adjunct phrases constitute units of syntax, called *maximal projections* XP of these X.

(Emonds (2000: 13))

In addition to lexical categories, the functional categories D and I are also projected up

and yield DP and IP, respectively. They are "dependent" categories in the sense that they cannot occur freely; D is associated with NP and I with VP. The category D functions to determine the referential properties of NP when paired with NP. The category I gives finiteness to VP by combining with it. These structural relationships can be defined as in (10).

(10) Functional Projections

FP = (DP) - F- XP; when F is I, then X is V and when F is D, then X is N.

(Emonds (2000: 21))

Emonds (2000: 17) defines DPs and IPs as "'extended projections' of N and V respectively."

Phrase structures constructed in the way as described above are then subject to lexical insertion. Emonds (2000) hypothesizes that lexical categories and functional categories undergo insertion in different ways. This hypothesis is based on the proposal that the Lexicon consists of two subcomponents. Section 2.4 introduces this proposal and Section 2.5 provides important assumptions of lexical insertion in Emonds' (2000) framework.

2.4. The Bifurcated Lexical Model

A distinctive feature of Emonds' (2000) model lies in the hypothesis concerning the Lexicon, an inventory of lexical items. He proposes the Bifurcated Lexical Model, where the Lexicon is decomposed into the two subcomponents: *Dictionary* and *Syntacticon*. The Dictionary is the inventory of the lexical items with purely semantic features *f*, that is, lexical categories N, V, A, and P. It also stores the bound lexical items with purely semantic features *f*. The Syntacticon is the inventory of the lexical items without *f* features; it thus contains functional categories and the semi-lexical categories as they are defined in (4).

The two subcomponents of the Lexicon also differ from each other in their relationship

with other mental faculties. While the Syntacticon is a purely syntactic component, the Dictionary is an interface between syntax and a mental faculty, as Phonological Form (PF) and Logical Form (LF) are the interfaces of syntax with mental faculties, namely, a perception / articulation system and an interpretation / use system, which are also known under the names of the articulatory-perceptual (or sensorimotor) system and the conceptual-intentional system (Chomsky (1995)). What the Dictionary interfaces with is "the mental faculty of culture and human memory" (Emonds (2000: 24)). This property allows the Dictionary to match with lexical items purely semantic features *f*, which play a role only out of syntax.

The next section introduces the second important hypothesis concerning lexical insertion, which is based on the bifurcation of the Lexicon.

2.5. Multi-level Lexical Insertion

2.5.1. Canonical Realization and Lexical Insertion

Let us first introduce the relationship between cognitive syntactic features F and syntactic categories. UG matches cognitive syntactic features F with appropriate syntactic categories. Canonically, the features are realized or inserted in their appropriate syntactic positions, which are called "canonical position." Emonds (2000) assumes that the features F can be interpreted at LF only when they are in such canonical positions. This pattern of realization is called "canonical realization":

(11) Canonical Realization

> Universal Grammar associates a few cognitive syntactic features F with each syntactic category B. These features F contribute to semantic interpretation (Logical Form) only in these "canonical positions" on B, and appear elsewhere only via language-particular lexical stipulation. (Emonds (2000: 8))

For example, tense features like [PAST] are matched with the category I, and thus I is the canonical position for [PAST]. The feature contributes to semantic interpretation only in that canonical position in syntactic structures. Some examples of the association between syntactic features and categories B are given in (12).

(12) Examples of *Probable* UG Matches:

	syntactic features F	*categories B*
a.	tense and modal features	I
b.	quantifier features	D or NUM
c.	space-time co-ordinates	P
d.	ACTIVITY	V
e.	PERFECTIVE (aspect)	V
f.	ANIMATE, COUNT	N
g.	comparative features	SPEC(XP)

(Emonds (2000: 8))

Typically, syntactic features are phonologically realized on their canonical positions via lexical insertion. Emonds (2000) assumes two ways of this type of lexicalization. In addition, he also assumes that syntactic features can be realized in non-canonical positions under strictly limited environments. In total, three types of lexical insertion are hypothesized in Emonds (2000). This hypothesis is called “Multi-level Lexical Insertion.” Although three types of lexical insertion are hypothesized, they are not equally available to the two lexical subcomponents, as shown in the overview in the next subsection.

2.5.2. Multi-level Lexical Insertion

Multi-level Lexical Insertion is an important hypothesis derived from the division of the Lexicon in that the Dictionary and the Syntacticon have different options for insertion. Emonds (2000) hypothesizes that the two subcomponents of the Lexicon differ in accessibility during syntactic derivation. The difference is summarized in Emonds (2005) as follows:

(13) Lexical Accessibility

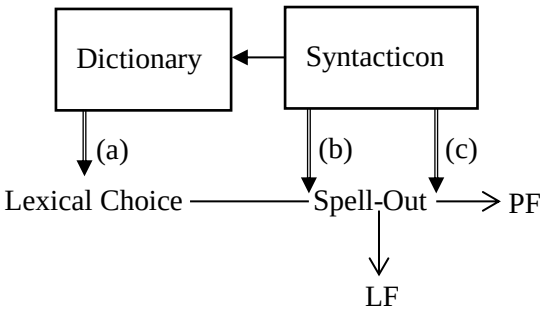
> The Dictionary can be accessed on a domain Δ only before syntactic processing. The Syntacticon […] *can be accessed at all derivational levels*.
>
> (Emonds (2005: 237))

That is, the items in the Dictionary are inserted only before syntactic derivation. In contrast, because the Syntacticon can be accessed at all derivational levels, the items stored in it can be inserted at several stages of a derivation. More precisely, the insertion of Syntacticon items can take place before, during, and after syntactic processing. This hypothesis can be summarized as in (14) and schematized in (15).

(14) Multi-level Lexical Insertion

> Lexical Items from the Syntacticon, in accord with their feature content, can be inserted at different stages of a derivation, via the Dictionary ("deep structure"), during a syntactic derivation, and during a phonological derivation.
>
> (Emonds (2000: 179))

(15)



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

a. Deep Insertion

b. Syntactic Insertion

c. PF Insertion

The downward arrows (a), (b), and (c) represent three options for the insertion of lexical items, which Emonds (2000, 2002) calls Deep Insertion, Syntactic Insertion, and PF Insertion, respectively. Among the three types of insertion, Deep Insertion and Syntactic Insertion realize syntactic features on their canonical positions; contrastingly, PF Insertion can realize them on non-canonical positions as well as their canonical positions.

As briefly mentioned at the end of the previous subsection, the three types of insertion are not equally available to the Dictionary and the Syntacticon. As arrow (i) represents, Dictionary items exclusively undergo Deep Insertion. Contrastingly, Syntacticon items can undergo all three types of insertion. First, they can undergo Deep Insertion via the Dictionary. Since the Dictionary is a list of the items with *f*, those items transferred from the Syntacticon to the Dictionary are somehow associated with *f*, and thereby they have idiosyncratic meanings. In addition, Syntacticon items can undergo the two other types of insertion according to whether they are interpreted at LF or not. Those contributing to LF interpretations, like derivational suffixes, are inserted prior to Spell-Out, as represented by arrow (ii). In contrast, those that are not interpreted at LF, like inflectional suffixes, are inserted after Spell-Out, as indicated by

arrow (iii). The three types of lexical insertion can be summarized as in (16)-(18), respectively.

(16) Deep Insertion

If a lexical entry for an item contains a purely semantic feature *f*, the item is inserted at the outset of transformational operations on the smallest domain of which it is the head.

(17) Syntactic Insertion

If an item contains no purely semantic feature *f* but its cognitive syntactic features F_i still contribute to Logical Form, it is inserted at the end of the transformational cycle on the largest domain of which it is the head.

(18) PF Insertion

If an item has no feature which contributes to Logical Form, it is inserted in PF and is absent during the derivation from underlying structure to LF.

(Emonds (2002: 260))

The Bifurcated Lexical Model, which hypothesizes Multi-level Lexical Insertion, can account for various syntactic and morphological phenomena. In so doing, the classification of the items from the Syntacticon is helpful for capturing a wide range of phenomena. Emonds (2000) gives the table in (19), which shows that there are six types of insertion from the Syntacticon according to "whether an item is bound or not and according to the level(s) of its being inserted into a derivation" (Emonds (2000: 120)).

(19) Types of Insertion from the Syntacticon

INSERTION LEVEL	FREE MORPHEMES	BOUND MORPHEMES
Prior to syntactic computation ("deep structure")	closed class X with specialized meanings, and parts of idioms	non-productive derivational morphology with specialized meanings
During syntactic computation, prior to Spell Out	closed class grammatical words with LF syntactic features	productive derivational morphology
During PF computation, after Spell Out	closed class grammatical words which are "place-holders"	inflectional morphology

(Emonds (2000: 121), with modifications)

The following two subsections (2.5.3, 2.5.4) briefly illustrate the three levels of insertion from the Syntacticon and introduce some important relevant assumptions.

2.5.3. Lexical Insertion before Spell-Out: Deep Insertion and Syntactic Insertion

First, let us illustrate the two types of insertion that occur before Spell-Out, namely, Deep Insertion and Syntactic Insertion. Both of these insert the items that are interpreted at LF and realize them on their canonical positions.

The differences between Deep Insertion and Syntactic Insertion are best illustrated by two types of deverbal nominals, result nominals and complex event nominals, which are closely studied by Grimshaw (1990) (see Emonds (2000: Section 4.7.2; 2002: Section 8)). They are different in the inheritance of properties of their verbal bases; while result nominals behave in the same way as ordinary nouns, complex event nominals inherit properties of verbal bases, so that they behave like the base verbs in some respects.[3] An example of each is given in (20a) and (20b), respectively.

[3] We will more closely observe differences between result nominals and complex event nominals in Section 5.2.

(20) a. We protest the city's three { high-rise / treeless } developments with no schools. (Emonds (2000: 152))

b. We protest any rapid development of new roads into the hills to attract industry. (Emonds (2002: 255))

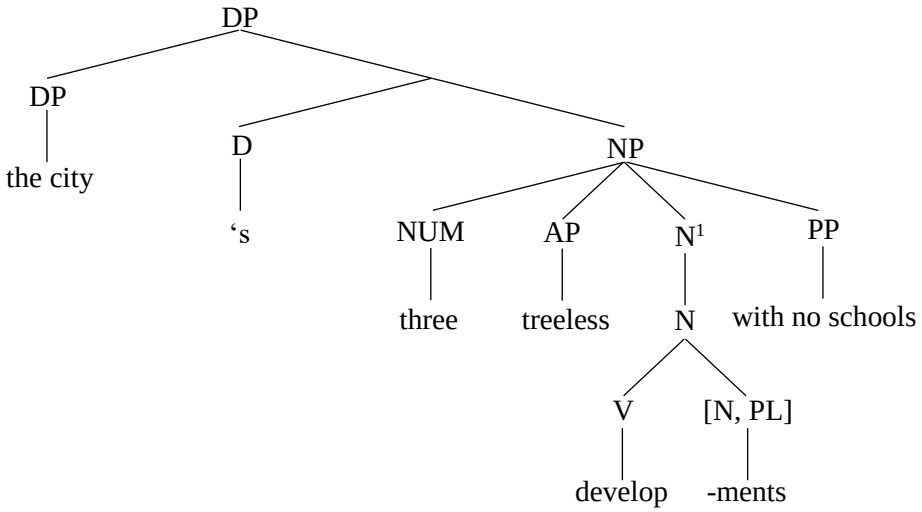
The deverbal noun *development(s)* shows different properties in (20a) and (20b). The result nominal *developments* in (20a) refers to concrete objects. As a result, it can be pluralized and modified by adjectives referring to physical objects (i.e., *high-rise* and *treeless*). By contrast, the complex event nominal *development* in (20b) holds eventual meanings of the base verb *develop*. Accordingly, it can be modified by the temporal adjective *rapid* and co-occur with *new roads*, which is the direct object of *develop*, and the directional PP *into the hills*. The following ungrammatical examples confirm that these characteristics of the two types of nominals are distinctive:

(21) a. We protest the city's three (*constant) developments (*into the hills). (Emonds (2000: 152))

b. We protest the (*three) constant development(*s) (*of no beauty) to attract industry. (Emonds (2002: 256), with slight modifications)

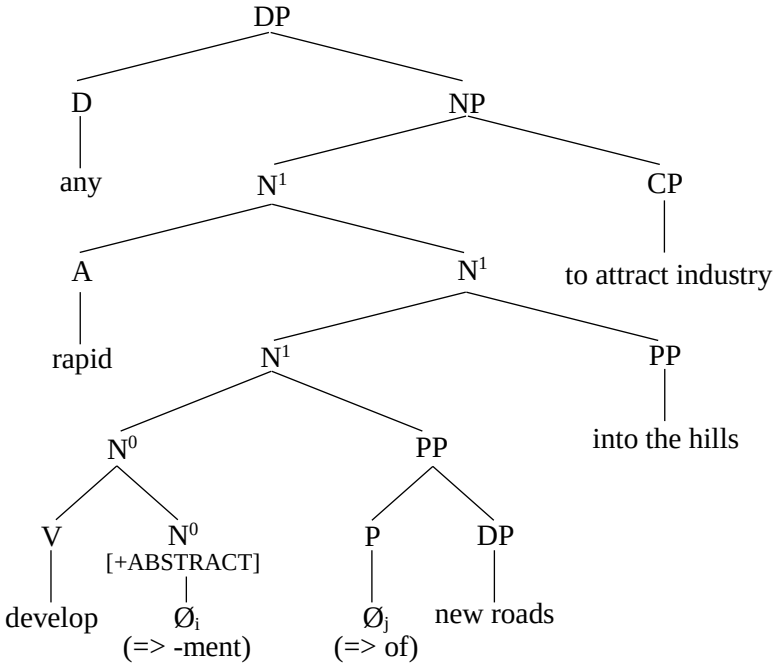
Emonds (2000, 2002) accounts for these differences by arguing that the nominal suffix *-ment* is inserted at different levels in the formation of result nominals and complex event nominals. More precisely, *-ment* in result nominals undergoes Deep Insertion, and Syntactic Insertion in complex event nominals. Thus, the structures at the level of Deep Insertion of (20a) and (20b) can be represented as in (22) and (23), respectively.

(22) Result Nominals; *-ment* present at deep structure:



(Emonds (2000: 153), with slight modifications)

(23) Complex Event Nominals; *-ment* replaces $Ø_i$ during the syntax:



(Emonds (2002: 256), with modifications)

In (22), the nominal suffix *-ment* is present from the beginning of the derivation, but in (23), the position for the suffix remains empty until the level of Syntactic Insertion. In other words,

the structural head of the NP in (23) is inert during syntactic computation. Under the hypothesis of Multi-level Lexical Insertion, such a situation can occur as a natural consequence when the head item of a given structure comes from the Syntacticon. This situation requires a careful definition of head in the Bifurcated Lexical Model.

Emonds (2000) thus distinguishes heads that have undergone lexical insertion from heads that have not. The former type is called a *lexical head*. The latter type is actually a structural head, but such a head "is entirely inert prior to the derivational moment which associates it with a lexical item" (Emonds (2000: 155)). Accordingly, when the structural head is not lexicalized, the lexical head instead functions as the head of the structure. Emonds (2000: 128) formalizes the definition of lexical heads as follows:

(24) Lexical Head/Projection

Let Y^0 be the highest lexically filled head in Z^j. Then Y^0 is the lexical head of Z^j, and Z^j is a lexical projection of Y^0. (Emonds (2000: 128); *j* = small integer)

Given the notion of lexical head, we can account for different properties observed in complex event nominals and result nominals. Complex event nominals behave like their base verbs because the base verb indeed serves as the lexical head until the insertion of the structural head *-ment*. Turning back to the structure in (23), we can identify the verb *develop* as the lexical head in NP. Since it functions as the head while *-ment* remains empty, it holds event meanings and the ability of argument-taking. As a result, the temporal modifier *rapid* and the directional PP *into the hill* are licensed. In addition, *develop*, as the lexical head, takes its direct object *new roads*. Meanwhile, result nominals contain the nominal suffix *-ment* at the beginning of the derivation, as indicated in (22). In this case, the suffix functions as a lexical head throughout the derivation. As a result, the word *development* shows nominal properties.

Deep Insertion and Syntactic Insertion have the same effect on interpretation in that the lexical items inserted via either of them are visible to LF. That is, the items contribute to LF interpretation. In result nominals, the suffixes are associated with verbs via semantic features *f*, resulting in specialized meanings. In complex event nominals, the suffixes have some cognitive syntactic features F like [+ABSTRACT]. By contrast, the third type of lexical insertion hypothesized in the Bifurcated Lexical Model, PF Insertion, phonologically realizes the items that do not contribute to LF interpretation. In addition, in some cases of PF Insertion, lexical items (or, more generally, syntactic features) are realized in non-canonical positions. These properties of lexical insertion at PF are outlined in the next subsection.

2.5.4. Lexical Insertion after Spell-Out

2.5.4.1. PF Insertion

As shown in the table in (19), PF Insertion from the Syntacticon is responsible for inserting place holders; that is, "they fill unidentified syntactic positions which may not be zero, but they do not themselves contribute to determining LF" (Emonds (2000: 124)).

Among such place holders are expletives. *There*-insertion is a good example of PF Insertion. Another example is *of*-insertion, which occurs to realize DP complements of deverbal nouns. This can be seen in (20b), which is repeated as (25).

(25) We protest any rapid development of new roads into the hills to attract industry.

(= (20b))

In this example, *of* is a semantically empty and purely syntactic preposition in that it assigns abstract case to the object DP *new roads*. Given that it does not play any role at LF, it can be assumed to undergo PF Insertion, as indicated by $Ø_j$ in the structure in (23).

Recall from the table in (19) that PF Insertion also implements the realization of inflectional suffixes. However, they are realized in a different way, as shown in the next subsection.

2.5.4.2. Inflectional Morphology as Alternative Realization

To introduce Emonds' (2000) view of grammatical inflection, let us first recall the canonical form of realization, which is outlined in Section 2.5.1. It states that syntactic features are associated with each syntactic category B and interpretable only in their canonical positions on B. In addition to this canonical pattern, Emonds (2000) hypothesizes that syntactic features in category B can be phonologically realized in "alternative" syntactic positions. In this case, since the morpheme realizing the syntactic features is not in a canonical position and is just a phonological realization, it does not contribute to LF; accordingly, it is inserted at PF. This realization pattern is called "Alternative Realization," which is defined as follows:

(26) Alternative Realization

A syntactic feature F canonically associated in UG with category B can be alternatively realized in a closed class grammatical morpheme under X^0, provided X^0 is the lexical head of a sister of B^j.

(Emonds (2000: 125), cf. Emonds (1987); see also Emonds (2016))

Importantly, alternative realization subsumes inflectional morphology. To see how inflectional morphology works in the Bifurcated Lexical Model, let us take inflected comparatives and verbal inflections as examples.

In his analysis of inflected comparatives, Emonds (2000) first observes as follows that

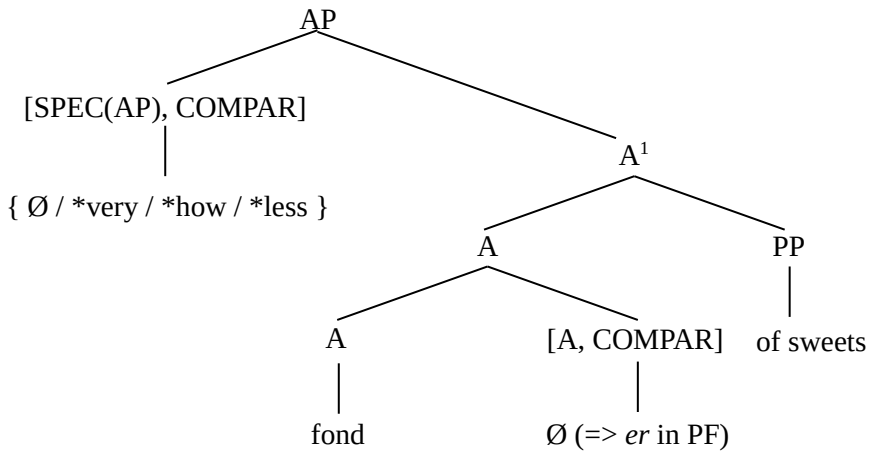
they do not co-occur with degree words:

(27) *very fonder of sweets, *how fonder of sweets, *less fondest of sweets, etc.

(Emonds (2000: 126))

This co-occurrence restriction suggests that comparatives and degree words are in the same syntactic position. Since degree words, modifiers of A, are in SPEC(AP), comparative features (i.e., [COMPARE]) also occur in this position. That is, comparatives are interpreted not on A but on SPEC(AP) (cf. Bresnan (1973)). Phonologically, the features in SPEC(AP) are realized as the morpheme *-er* under A at PF, as shown in (28).

(28)



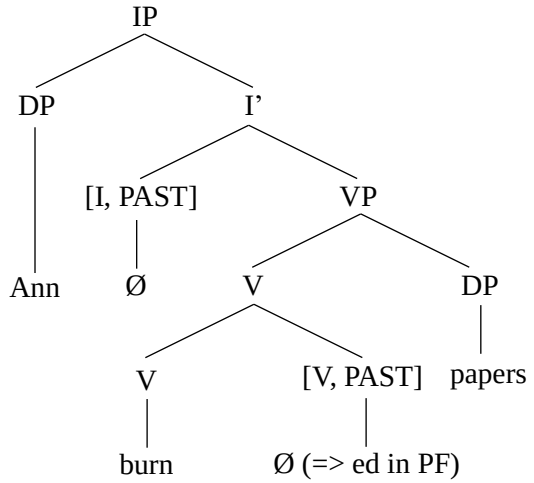
(Emonds (2000: 126))

In this example, while comparative features are canonically associated with SPEC(AP) and thus interpreted on this position, they are alternatively realized by *-er* under A; since *-er* is inserted in PF, the morpheme itself does not contribute to interpretation. In Emonds' (2000: 127) words, it seems "preferable to identify the SPEC(AP) position as the uniform canonical locus

of LF interpretation for the degree of an AP, and to consider the comparative/superlative inflections in English as a kind of 'PF agreement' with this position." In this way, Emonds (2000) assimilates comparatives to a form of PF Insertion, alternative realization, even though they are "meaningful."

In addition to comparatives, verbal inflections can also be analyzed as alternative realization. For example, the tense feature [PAST] is canonically matched with I. The feature is indeed interpreted in this position at LF, but it is not phonologically realized there; alternatively, it is realized under V at PF, as shown in (29).[4]

(29) Context for PF Insertion of *-ed*:



(Emonds (2000: 128))

Note here that although the word *burned* is headed by the suffix *-ed*, the suffix does not interfere with the argument-taking of the verb. This is because *-ed* remains empty during the syntactic computation and failed to function as the lexical head, which is defined in (24), repeated as (30).

[4] This AR analysis of verbal inflection "subsume[s] classic English affix movement" and eliminates "any need for either a lowering transformation or for abstract 'LF raising' of verbs to I" (Emonds (2000: 127)).

(30) Lexical Head/Projection

Let Y^0 be the highest lexically filled head in Z^j. Then Y^0 is the lexical head of Z^j, and Z^j is a lexical projection of Y^0. (= (24))

In Emonds' (2000: 129) words, "only at the PF level is [$_V$ *-ed*] the lexical head of the VP *burned the papers* [in (29)]. But this is exactly as desired, since the PF head *-ed* has no effect on complement selection or case assignment." Rather, the open class V and its object DP can be regarded as "sisters" at all levels other than PF.[5]

2.6. Morphology in the Bifurcated Lexical Model

So far, we have outlined the Bifurcated Lexical Model, which hypothesizes three levels of insertion, namely, Deep Insertion, Syntactic Insertion, and PF Insertion. Under this model, this thesis deals with various morphological phenomena. To better understand this model in the context of the study of morphology, let us describe theoretical characteristics of the model, following Stewart's (2016) description of morphological theories.

Stewart (2016) clarifies the theoretical similarities and differences among fifteen

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[5] Due to the notion of lexical head, the Bifurcated Lexical Model obtains the same effect as the notion of a relativized head proposed by Di Sciullo and Williams (1987). They define a head as follows:

(i) Definition of "head$_F$" (read: head with respect to the feature F)
The head$_F$ of a word is the rightmost element of the word marked for the feature F.
(Di Sciullo and Williams (1987: 26))

For example, in the inflected verb *sees*, the verb *see* possesses argument structures but the inflectional suffix *-s* lacks them. Under the notion of relativized head, two heads can be assumed:

(ii) a. head$_{\text{argument structure}}$: *see*
b. head$_{\text{inflectional features}}$: *-s*

In this way, Di Sciullo and Williams (1987) explain the fact that the verb can select complements even though it is the left-hand constituent. Within the hypothesis of Multi-Level Lexical Insertion, however, we can reduce this "relativization" to the difference in the stages at which *see* and *-s* are inserted, as outlined here.

morphological frameworks based on their positions regarding the following five issues:

(31) a. morpheme-based vs. word/lexeme-based

b. formalist vs. functionalist

c. in-grammar vs. in-lexicon

d. phonological formalism vs. syntactic formalism

e. incremental vs. realizational

First, the distinction in (31a) "concerns the basic units around which morphological activity is assumed to be organized" (Stewart (2016: 5)); morpheme-based theories consider a morpheme as the atomic meaningful unit, whereas word/lexeme-based theories regard a word or lexeme as the smallest unit. Second, "formalist approaches focus primarily on rules, constraints, and units which are particular to language structure" and their goal is to capture "'all and only' those generalizations relevant to the characterisation of linguistic competence" (Stewart (2016: 6)). Meanwhile, "[f]unctionalist approaches are interested more in contextualising language as cognitively and socially grounded behaviours" (Stewart (2016: 6)). The third contrast in (31c) is related to whether morphology is placed in the grammar or the lexicon. In "in-grammar" approaches, morphology is put in the grammar "as its own autonomous component or sometimes as distributed among independently motivated components, typically syntax and/or phonology" (Stewart (2016: 6)), and the lexicon is regarded as a repository of idiosyncrasy. In "in-lexicon" approaches, morphology is placed in the lexicon, which is "a repository for most if not all lexical knowledge, predictable or not," and "the complex lexical entries interact with grammatical structures in as many distinct ways as grammatical structure requires" (Stewart (2016: 6)). The fourth difference between phonological formalism and syntactic formalism (31d) is associated with the third contrast; in-grammar approaches "tend to formalise

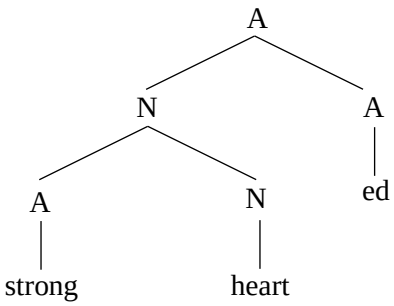
morphological rules to be as similar as possible to the rules assumed for an adjacent component of grammar" (Stewart (2016: 7)). An approach arguing for phonological formalism "formalises lexical and post-lexical phonological rules in similar ways, distinguishing them by domain of application, rather than by making a formal distinction in rule construction" (Stewart (2016: 7)). The fifth distinction in (31e), incremental vs. realizational, which is adopted from Stump (2001: 2-9), "focuses on the input/output conditions of the morphological component" (Stewart (2016: 7)). Incremental approaches assume that "the meaning and other attributes of morphologically complex expressions are built up gradually as a more or less additive process" (Stewart (2016: 7)). For example, the inflected word "*likes* acquires the properties '3sg subject agreement,' 'present tense,' and 'indicative mood' only through the addition of *-s*" (Stump (2001: 2)). By contrast, realizational approaches assume that "a lexical base (whether root, lexeme, or lexical stem) and some set of morphosyntactic properties (appropriate both to that base and to the context in which the complex expression finds itself) jointly determine the morphophonological 'spell-out' of the fully inflected word in that context" (Stewart (2016: 7)). According to this view, "the association of the root *like* with the properties '3sg subject agreement,' 'present tense,' and 'indicative mood' licenses the attachment of the suffix *-s*" (Stump (2001: 2)).

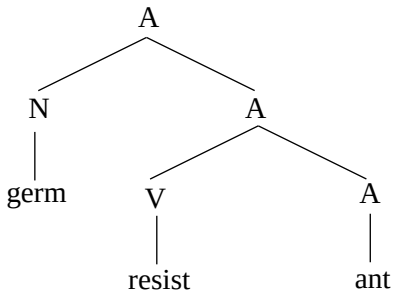
Turning to Emonds' (2000) model, we can describe it as follows. First, it takes morphemes as atomic items; for example, the complex word *development* is formed by the concatenation of the verb *develop* and the suffix *-ment*. Thus, it is a *morpheme-based* approach. Second, this model has, along with other generative theories, an interest in formally specifying "all and only the grammatically well-formed strings of a language" (Emonds (2000: 1)). Emonds (2000) begins with the following citation from Chomsky (1957: 13): "The fundamental aim in the linguistic analysis of a language L is to separate the *grammatical* sequences which are the sentences of L from the *ungrammatical* sequences which are not

sentences of L and to study the structure of the grammatical sequences." This declares that the model is a *formalist* approach. Third, the model "takes as established that syntactic theory must account for the regular and often fully productive grammatical patterns of morphology and compounding which operate both within and across X^0 domain boundaries" (Emonds (2000: 76)). In addition, this model regards the lexicon as "the totality of grammatical items and sequences of items stored in memory" (Emonds (2000: 76)). Thus, the model is an *in-grammar* approach. This is also related to the fourth characteristic; that is, the model formalizes the morphological rules and the syntactic rules in the same way. For example, Emonds (2000: 88) argues that "word-internal and phrasal categorization are cut from the same formal cloth." Accordingly, the model adopts a *syntactic formalism*. Lastly, the model can be characterized as both *incremental* and *realizational*. This model is *incremental* in the formation of compounds by Deep Insertion; compounds are formed by adding one lexical item from the Dictionary to another. At the same time, this model is *realizational* in the realization of lexical items from the Syntacticon by Syntactic Insertion or PF Insertion (including Alternative Insertion). In this type of insertion, feature sets determine which phonological forms are used to realize them. This indicates the characteristic of realizational approaches.

In the following chapters, we will analyze various morphological phenomena within this framework with the characteristics described just above. Before proceeding, it is important to reinterpret the three major morphological processes, namely, compounding, derivation, and inflection, in light of this model, because the model provides a new perspective on these processes. First, let us consider compounding and derivation. As an in-grammar and syntactic formalist approach, Emonds' (2000) model assumes that the two morphological processes traditionally called compounding and derivation are the same in that they combine zero-level categories, as in (32).

(32) a. strong hearted b. germ resistant

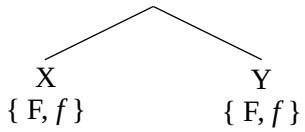




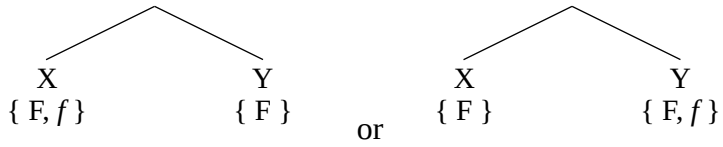
(Emonds (2000: 83))

The two processes are, however, different in the status of the morphemes combined; compounding combines two morphemes that have purely semantic features *f*, whereas derivation attaches a morpheme without purely semantic features *f* to a lexical category. In (32a), for example, the two lexical categories, *strong* and *heart*, are combined, and this process is compounding. The resultant structure is combined with the adjectival suffix *-ed*, which lacks purely semantic features *f*; this process is derivation. In (32b), derivation occurs first, and then compounding takes place. Given this distinction, we can reinterpret compounds and derivatives. For explanatory purpose, let us suppose a complex word X-Y. If X and Y are lexical categories, which have purely semantic features *f*, the word is a compound. If X or Y is a functional item, which lacks purely semantic features *f*, and the rest is a lexical category, then the word is a derivative. Thus, compounds and derivatives can be schematically represented as in (33), where feature compositions are indicated in curly brackets.

(33) a. Compounds:



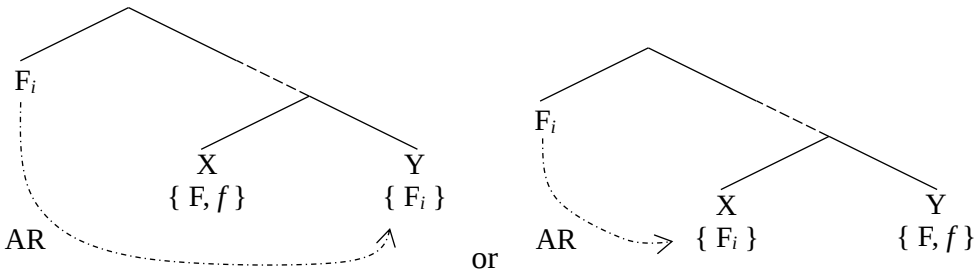
b. Derivatives:



Compounding and derivation can be also characterized based on which insertion is involved. Compounds contain lexical categories and they are listed in the Dictionary. Thus, compounds are formed by Deep Insertion of lexical categories. In contrast, derivatives contain a functional item, and thus they are formed by its Syntactic Insertion.

The processes are even more crucial in distinguishing between derivation and inflection. This is because derivatives and inflected words are the same in that they consist of a lexical category and a functional category. They differ in the processes by which the relevant functional items are inserted. As outlined in Section 2.5.4.2, inflectional items are phonologically realized by Alternative Realization (AR), which occurs at PF. Thus, inflected words can be represented as in (34), where the subscript *i* indicates co-indexation.

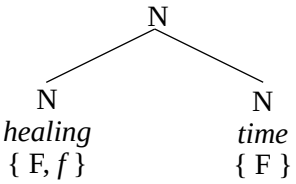
(34) Inflected Words:



In this thesis, I adopt (33a), (33b), and (34) as structural definitions of compounds, derivatives, and inflected words. Combining these definitions with the semi-lexical categories that can be assumed in Emonds' framework, we can deal with long-standing issues in distinguishing among compounding, derivation, and inflection. For example, let us consider

the word *healing time*, which will be closely examined in Chapter 4. This word is generally considered a compound (e.g., Boase-Beier (1987)). Note, however, that *time* is defined as a semi-lexical noun (see (5a)). Since semi-lexical nouns lack purely semantic features *f*, *healing time* has the structure of (33b), as represented in (35) (putting aside the suffix *-ing* here).

(35)



This means that *healing time* is not a compound but a derivative. Under this view, we can successfully capture the behaviors of this kind of word, as will be discussed in Chapter 4. Thus, it is important to clarify what semi-lexical categories can be assumed in the framework outlined in this chapter and how they interact with the three types of insertion. The next subsection elaborates "semi-lexicality" in the Bifurcated Lexical Model and proposes a new type of semi-lexical category that is not presented in Emonds (2000).

2.7. Elaborating Semi-lexical Categories in the Bifurcated Lexical Model

As illustrated in Section 2.2, Emonds (2001) defines semi-lexical categories as follows:

(36) Semi-lexical Categories

Semi-lexical heads (= grammatical heads) are those N, V, A, and P which have no purely semantic features *f*. (= (4))

Given that these categories lack purely semantic features *f*, they are listed in the Syntacticon.

They are, however, not canonical items of the Syntacticon. This is because the Syntacticon contains genuine functional items as its primary members, such as derivational and inflectional affixes and D and I. In this sense, semi-lexical N, V, A, and P are secondary items of the Syntacticon. Since ordinary N, V, A, and P are stored in the Dictionary, we can assume that semi-lexical N, V, A, and P are arguably borrowed from the Dictionary to implement some grammatical functions. More precisely, the Syntacticon borrows the (phonological) forms of lexical categories in the Dictionary and assigns them grammatical functions, yielding grammatical N, V, A, and P. If so, the Syntacticon consists of two strata, as shown in (37).

(37) Syntacticon: an inventory of lexical items without purely semantic features *f*

a. Primary Items: derivational affixes, inflectional affixes, D, I, etc.

b. Secondary Items: **grammatical N, V, A, P (= semi-lexical categories)**

Importantly, it is secondary items in the Syntacticon that Emonds (2000) labels as semi-lexical categories. Based on the distinction between primary and secondary items, we can redefine semi-lexical categories as follows:

(38) Definition of Semi-lexical Categories

Semi-lexical categories are secondary items in the lexical component that list them.

Therefore, departing from the original notion proposed in Emonds (2000), we can reduce semi-lexicality to secondary membership in the lexical component.

Note that the term “the lexical component” in the definition in (38) can refer not only to the Syntacticon but also to the Dictionary. Thus, this definition opens the possibility of assuming *semi-lexical categories in the Dictionary*, which is not examined in Emonds (2000).

That is, as opposed to the case of the Syntacticon, the Dictionary can contain *secondary items that originate from the Dictionary*. This is reasonable, given that Syntacticon items can undergo Deep Insertion via the Dictionary. In Chapter 5, I will clarify the insertion process by proposing the following:

(39) When Syntacticon items undergo Deep Insertion, they are assigned purely semantic features *f* in the Dictionary.

Given this proposal, Syntacticon items like derivational affixes can be secondary items of the Dictionary through the assignment of *f* features. Let us call such affixes from the Syntacticon "heavy affixes." These heavy affixes, though not canonical members of the Dictionary, have the same status as lexical categories. The Dictionary, then, as well as the Syntacticon, has two types of lexical item, as shown in (40).

(40) Dictionary: an inventory of lexical items with purely semantic features *f*

a. Primary Items: lexical N, V, A, P

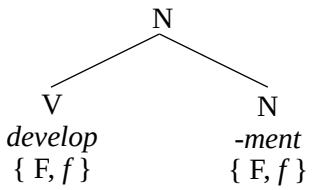
b. Secondary Items: **"heavy" affixes (originating in the Syntacticon)**

Given the definition of semi-lexical categories in (38), heavy affixes in the Dictionary can also be regarded as semi-lexical categories.

Given the definition in (38), we now have two types of semi-lexical item in the Bifurcated Lexical Model: grammatical N, V, A, and P in the Syntacticon and heavy affixes in the Dictionary. In what follows, I will use the term "semi-lexical categories" as a cover term for the secondary items in the Dictionary and Syntacticon. The proposed definition of semi-lexicality provides a systematic way to identify semi-lexical categories and explore their

behaviors especially in word-formation. In addition, as mentioned in the last subsection, we can shed light on boundary issues in morphology concerning the distinction among compounding, derivation, and inflection. Combined with the definitions of compounds, derivatives, and inflected words, the two types of semi-lexical category lead us to reconsider the morphological status of complex words. In the last subsection, we briefly consider the case of *healing time*, which can be analyzed, not as a compound but a derivative. Another example comes from result nominals like *development(s)*. As outlined in Section 2.5.3, Emonds (2000) argues that result nominals are formed by Deep Insertion of nominal suffixes like *-ment*. Whereas Emonds (2000) does not seem to assume qualitative differences between nominal suffixes in result nominals and those of complex event nominals, we can differentiate "heavy" suffixes from ordinary suffixes based on the proposal in (39) and the definition in (38). Specifically, the suffix *-ment* in the result nominal *development(s)*, for example, has an *f* feature, which means that the suffix is a secondary item in the Dictionary. If so, the result nominal has the following structure:

(41)



This is the structure of compounds; that is, the result nominal *development(s)* is not a derivative but a compound. This analysis is preferable so as to account for certain empirical facts (see Chapter 5 for a detailed discussion). Together with result nominals, the complex words we will examine in Chapters 5 and 6, namely, converted deverbal nouns in English and Japanese

and compounds containing mimetics in Japanese (e.g., *kabe-don* ‘wall-Mim’), support the existence of the semi-lexical categories in the Dictionary.

2.8. Summary and Overview

This chapter introduced the theoretical framework adopted in this thesis and elaborated the notion of semi-lexicality. The framework contains two basic hypotheses, the bifurcation of the Lexicon and Multi-level Lexical Insertion. First, the Lexicon is decomposed into two subcomponents, the Dictionary and the Syntacticon. The former contains lexical categories (nouns, verbs, adjectives, and prepositions) and the latter stores functional categories. Second, Multi-level Lexical Insertion hypothesizes that Syntacticon items can undergo three types of insertion: Deep Insertion, Syntactic Insertion, and PF Insertion. The three types of lexical insertion yield compounds, derivatives, and inflected words, respectively.

Importantly, the Syntacticon includes not only traditionally recognized functional items such as D and I, but also grammatical nouns, verbs, adjectives, and prepositions, which lack purely semantic features *f*. These categories are called semi-lexical categories. They are, however, not primary items in the Syntacticon; they can be regarded as secondary items in that they originate in the Dictionary. Interpreting semi-lexicality as secondary membership in the lexical component, we can also assume *semi-lexical items in the Dictionary*, which come from the Syntacticon. Based on this view of semi-lexicality and the hypothesis of Multi-level Lexical Insertion in the Bifurcated Lexical Model, we will shed a new light on semi-lexical categories and long-standing issues in morphological studies.

We are now in position to (partially) answer the questions by Corver and van Riemsdijk (2001a) mentioned in Chapter 1, which are repeated in (42).

(42) a. What types of semi-lexical nouns, verbs, adjectives and prepositions can be

distinguished?

b. What distinguishes them from truly grammatical functors?

c. Is this distinction expressed in terms of their lexical feature-composition, and if so, what features are involved?

d. How do they combine in syntactic structure and how do they project syntactically?

(Corver and van Riemsdijk (2001a: 10))

Note that the questions in (42a, b) are only about semi-lexical items in the Syntacticon. As already mentioned, we can assume semi-lexical items in the Dictionary. To capture semi-lexical items as a whole, they should be paraphrased, as in (43).

(43) a. What types of semi-lexical items can be distinguished?

b. What distinguishes them from truly lexical or functional categories?

We can answer the questions in (43a, b) and (42c, d), as follows:

(44) a. Semi-lexical Items in the Syntacticon (= Grammatical N, V, A, and P)

(43a): They are "the most frequently used and least semantically specific members of each lexical category" (Emonds (1985: 162)).

(43b): They fall under the category N, V, A, or P and are secondary items in the Syntacticon.

(42c): They lack purely semantic features *f*, which distinguishes them from other regular lexical categories.

(42d): They are stored in the Syntacticon. Accordingly, they can be

associated in principle with syntactic structure by three types of lexical insertion (i.e., Deep Insertion, Syntactic Insertion, and PF Insertion).

b. Semi-lexical Items in the Dictionary

(43a): They are affixes that undergo Deep Insertion.

(43b): They originate from the Syntacticon and are secondary items in the Dictionary.

(42c): They have purely semantic features *f*, which distinguishes them from other regular functional categories.

(42d): They are inserted into computation from the Dictionary along with ordinary lexical categories.

With this background, the rest of this thesis seeks answers to the questions in (45), which are repeated from Section 1.2.

(45) a. What lexical items can be classified as semi-lexical categories?

b. What roles do they play in grammar, especially in morphology?

c. What status do they have in a grammar system?

Given the theoretical framework introduced in this chapter, the question in (45c) can be elaborated. The grammar system introduced in this chapter contains two lexical components with different systems of lexical insertion. Accordingly, (45c) can be replaced with the following question:

(46) In which lexical component is a lexical item stored, the Dictionary or the

Syntacticon? If it is a member of the Syntacticon, which lexical insertion does it undergo?

Answering the questions in (45) and (46), Chapters 3-6 will demonstrate that the existence of semi-lexical elements and the relevant morphological phenomena can be explained as a natural consequence of the two main hypotheses in the theoretical framework. More precisely, Chapters 3 and 4 will first examine semi-lexical categories in the Syntacticon, as Emonds (2000) originally assumes. We will identify several types of semi-lexical prepositions in Chapter 3 and semi-lexical nouns and verbs in Chapter 4 and study their behaviors in word-formation. These chapters provide further evidence for semi-lexical items in the Syntacticon. Chapters 5 and 6 will then explore semi-lexical items in the Dictionary, which are not considered in Emonds (2000). Chapter 5 will investigate deverbal nouns in English and argue that result nominals are formed by combining semi-lexical suffixes (or heavy suffixes) in the Dictionary with verbs. In addition, Chapter 5 argues that the Dictionary contains silent elements, which come from the Syntacticon. This means that they are secondary items in the Dictionary and thus are semi-lexical items. The existence of these silent semi-lexical elements in the Dictionary will be further supported in Chapter 6, where compounds containing mimetics in Japanese (e.g., *kabe-<u>don</u>* 'wall-Mim') will be analyzed. Analyzing English and Japanese nominalization and Japanese compounds, Chapters 5 and 6 will demonstrate that in addition to semi-lexical items in the Syntacticon, those in the Dictionary are also an essential part of UG.

Chapter 3

Retrieving Prefixation from Derivational Morphology in English

3.1. Introduction[1]

The last chapter introduced the notion of semi-lexicality. Emonds' (2000) original proposal is that semi-lexical categories are grammatical nouns, verbs, adjectives, and prepositions in the Syntacticon. This chapter focuses on grammatical prepositions and explores what prepositions can be regarded as grammatical.

According to Emonds (2007: Chapter 4), grammatical prepositions include post-verbal particles like *off* in *to sell off appliances* (see also Naya (2015)). Interestingly, Emonds (2005) argues that they also subsume prefixes like *re-* and *mis-*. Specifically, the prefixes attached to verbs are prepositions appearing inside verbs, which alternatively realize syntactic features in a certain post-verbal position. This approach is theoretically significant because it shows that semi-lexical categories can be explored by studying prefixes. In addition, it provides a new way to explore the nature of prefixes and prefixation; unlike the general assumption that prefixation is grouped together with suffixation as a derivational process, Emonds' (2005) study regards prefixation as the same process as inflection because they are implemented by alternative realization (AR).

Given Emonds' (2005) study, we may think that every prefix is a grammatical preposition. However, not all prefixes can be characterized as grammatical; on the contrary, Nagano (2011a, 2013a, 2013b) points out that many prefixes in English have properties characteristic of lexical categories (or lexemes) and argues that they are, in fact, lexical categories.

[1] This chapter is a revised and extended version of Isono, Wakamatsu, and Naya (2016, 2017a, 2017b).

Combining the insights of Emonds' (2005) and Nagano's (2011a, 2013a, 2013b) studies, this chapter argues that prefixes can be classified into lexical and functional prefixes and proposes that Emonds' (2005) analysis is applicable only to functional prefixes. As for lexical prefixes, since they are lexical categories in the Dictionary, they undergo Deep Insertion; that is, their attachment is a form of compounding. Therefore, prefixation can be resolved into the two processes of AR and compounding. Let us call this analysis the Resolving Analysis of prefixation.

If this analysis is correct, all of the prefixes participate in either compounding or AR, and those prefixes undergoing AR are grammatical prepositions. It is important here to examine processes involving the prefixes that are formally identical to prepositions, which can be called prepositional prefixes (e.g., *out-*, *over-*, *under-*, *up-*, etc.), as they are not explicitly studied in Emonds (2005) and Nagano (2011a, 2013a, 2013b). We can identify the prepositional prefixes realized by AR as new grammatical prepositions. This chapter demonstrates that *out-* with the meaning of 'surpass' is a grammatical preposition.

This analysis has an important consequence for the division of labor in morphology. If the attachment of prefixes is either compounding or AR, a post-Spell-Out process, then prefixation can be retrieved from derivational morphology. This consequence is preferable in that the role of derivation is then limited to changing categories.

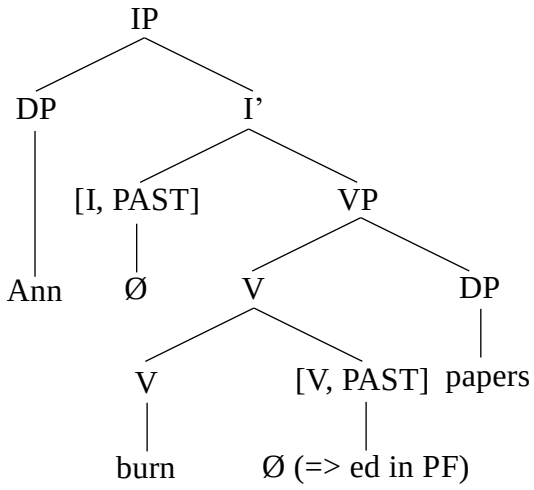
This chapter is organized as follows. Section 3.2 presents Emonds' (2005) analysis of prefixation, where prefixes are assumed to be the AR of the syntactic features in certain post-verbal position. Introducing Nagano's (2013a) study, Section 3.3 shows that prefixes can be classified into lexical and functional categories. Combining Emonds' (2005) and Nagano's (2013a) studies, Section 3.4 proposes the Resolving Analysis of prefixation, which assumes that the attachment of lexical prefixes is compounding and that of functional prefixes is AR. Sections 3.5-3.7 examine whether the Resolving Analysis can be applied to

prepositional prefixes, thereby distinguishing functional prepositional prefixes from lexical ones. Section 3.5 first points out that although prepositional prefixes arguably have the category P, Emonds' analysis cannot be extended to them straightforwardly. Then, based on a diagnostic adopted in Nagano (2013a), Section 3.6 demonstrates that prepositional prefixes can also be classified into the two types. Section 3.7 shows how lexical and functional prepositional prefixes are realized and provides evidence for this analysis. Section 3.8 discusses consequences of the proposed analysis. Specifically, if all types of prefixation can be regarded as compounding or AR, then prefixation has no role in derivational morphology. As a result, prefixes do not have category-changing functions, which is generally considered as residing in derivation. The section shows that this view is supported empirically. Finally, Section 3.9 offers concluding remarks.

3.2. Emonds (2005): Prefixation as a Post-Syntactic Operation

Within the Bifurcated Lexical Model, Emonds (2005) briefly argues that prefixes are inserted at the level of PF Insertion. More precisely, prefixes alternatively realize certain cognitive syntactic features in some syntactic position. Recall from Section 2.5.4.2 that alternative realization (AR) is well exemplified by inflectional suffixes like *-ed* in (1).

(1) Ann burned papers.



(Emonds (2000: 128))

In this example, the suffix *-ed* is just a phonological realization of the syntactic feature [PAST], which is canonically associated with I. Likewise, Emonds (2005) assumes that prefixes alternatively realize certain cognitive syntactic features in their canonical positions, where they are interpreted in LF. That is, prefixation is the same process as the realization of inflectional elements. In this sense, prefixation can be grouped together with inflectional morphology. Let us examine his analysis — which can be called "AR Analysis" — in detail.

Emonds (2005) identifies the canonical position for the features related to prefixes by taking *re-* as an example. First, he assumes that *re-* is associated with the syntactic feature [AGAIN]. Then, he observes that *re-* and post-verbal particles are in complementary distribution, as shown in (2)-(4) (see also Carlson and Roeper (1980), Keyser and Roeper (1992), and Ishikawa (2000) for related issues).

(2) a. John shipped (off) his prizes.

b. John reshipped (*off) his prizes.

(3) a. Let's build (up) our defenses.

b. Let's rebuild (*up) our defenses.

(4) a. She wrote (down) the response.

b. She rewrote (*down) the response.

(Emonds (2005: 259))

Based on this fact, he assigns *re-* the same grammatical status as post-verbal particles, which are widely assumed to be (intransitive) P. This means that *re-* and post-verbal particles are interpreted in the same position, post-verbal complement, and thus they compete with each other for the syntactic position. As a result, they cannot co-occur, as observed in the (b)-examples in (2)-(4). If the prefix is interpreted in the post-verbal position, *re-* itself does not contribute to LF-interpretation; rather, it is just a phonological realization of the feature [AGAIN]. Such purely phonological elements are assumed to be inserted at PF. Accordingly, *re-* can be analyzed as being inserted at PF and alternatively realizing [AGAIN].

Emonds (2005) argues that other prefixes can be analyzed in the same way. For example, he provides an analysis of the prefix *mis-*. If *mis-* is also an alternative realization, it should be characterized only by syntactic features. To identify its feature content, Emonds (2005) observes the examples in (5) and points out that *mis-* can be replaced with the adverb *badly*. Given this fact, Emonds (2005) assumes that *mis-* shares the features with the manner adverb *badly*.

(5) a. The children misbehaved.

b. Someone misinvested our funds.

c. He mistreated his employees.

d. Be careful not to misword our reply.

e. He misattributed songs.

f. They have misread our message.

(Emonds (2005: 260))

According to Emonds (2005: 260), *badly* can be fully characterized by the following syntactic features: [MANNER], [NEG(ATIVE)], and a basic evaluative feature [EVAL(UATIVE)]. These features are assumed to be canonically matched with a post-verbal position and to be alternatively realized by *mis-* in (5). Emonds (2005) states that other prefixes can be analyzed along these lines. For example, *co-* and *ex-* may have the same syntactic features as *together* and *former*, respectively.

In sum, Emonds (2005) regards prefixation as a process that phonologically realizes syntactic features at the post-syntactic level. Importantly, in this analysis, prefixation is not a part of word-formation; rather, it belongs to the same class as inflection. In this sense, we can see prefixation as "inflectional." Emonds' analysis is theoretically significant in that it enables us to analyze prefixation from a new perspective. However, it does not appear that his analysis can be straightforwardly extended to prefixes in general, because we face a paradoxical situation when we consider that all prefixes result from AR. This suggests that we need to carefully examine the coverage of Emonds' (2005) analysis. In what follows, we will distinguish functional prefixes, which undergo AR, from lexical prefixes, which undergo Deep Insertion (and as a result, form compounds), and confirm whether this classification can be applied to prepositional prefixes.

3.3. Nagano (2013a): The Morphological Status of Prefixes

The problem with Emonds' (2005) analysis concerns the morphological status of prefixes. In his analysis, prefixes are considered functional elements; otherwise, they cannot undergo PF Insertion. If some prefixes have the same characteristics as lexemes,

they call for purely semantic features *f* and undergo only Deep Insertion.[2] That is, such "lexical" prefixes are not compatible with Emonds' (2005) analysis. Thus, it is important to identify the morphological status of prefixes in order to delimit the scope of the application of Emonds' (2005) analysis.

In this regard, Nagano's (2013a, 2013b) study is helpful. Nagano (2013a) is a recent study of the morphological status of prefixes in English and demonstrates that many of them are lexemes. Distinguishing between lexemes and grammatical morphemes (or functional categories) in the study of indirect and direct modification, Nagano (2013b) also states that prefixes consist of two types, namely, lexical and functional prefixes, as in (6) (see also Plag (2003: Section 4.5), Lieber (2005: Section 5.1)).

(6) Lexical Prefixes

a. Evaluative Prefixes: *mal-*, *pseudo-*, *super-*, etc.

b. Spatio-temporal Prefixes: *circum-*, *inter-*, *pre-*, etc.

c. Quantitative Prefixes: *bi-*, *multi-*, *semi-*, etc.

Functional Prefixes

d. Negative Prefixes: *de-*, *non-*, *un-*, etc.

e. Aspectual Prefixes: *be-*, *en-*, *re-*, etc.

(Nagano (2013b: 121))

Combining Emonds' (2005) study with Nagano's (2013a, 2013b) study, we can define the

[2] Emonds (2005: 260) notes that prefixes may undergo Deep Insertion when they have idiosyncratic meanings. For example, *mis-* in the following examples is realized by Deep Insertion:

(i) a. mislay 'forget where one put'
b. misrepresent 'be untruthful about' (rather than 'represent in a bad way')
(Emonds (2005: 260))

coverage of AR analysis. If it is functional categories but not lexical categories that can be successfully treated in AR analysis, only functional prefixes (i.e., negative and aspectual ones in (6d, e)) can be included in the analysis. In other words, lexical prefixes need to be analyzed in a different way from functional prefixes. In Section 3.4, I will propose a new approach to the two types of prefixes. Before proceeding, let us see how lexical and functional prefixes can be distinguished from each other by briefly reviewing Nagano (2013a, 2013b).

One way to reveal the morphological status of prefixes is to examine whether a given complex word with a prefix is a compound or not; if the word is a compound, the prefix is a lexeme because a compound consists of two or more lexemes. Compoundhood can, in turn, be revealed by examining whether or not the complex word in question violates the Lexical Integrity Principle in a certain environment; Nagano (2013b) points out that violation of the Lexical Integrity Principle will occur in compounding but not in derivation or inflection, if it is possible.[3] Among violations of the principle is Coordination Reduction (CR). Let us first observe how compounds that consist of uncontroversial lexemes behave in CR:

(7) a. book-__ and newspaper-stands

b. gossip-__ and scandal-mongers

c. book-binders and __-sellers

(Kenesei (2007: 274))

In (7a), for example, *book-stands* and *newspaper-stands* are coordinated and the identical constituent *stands* in the first conjunct is deleted. The examples in (7) are all acceptable,

[3] Anderson (1992: 84) defines the Lexical Integrity Principle as follows:

(i) The syntax neither manipulates nor has access to the internal structure of words.

indicating that compounds can undergo CR. On the other hand, the tense marker, a typical example of functional morphemes, cannot be deleted even in the context of coordination, as shown in (8).

(8) John walk*(ed) and danced. (Nishiyama (2016: 84))

The contrast in grammaticality between (7) and (8) indicates that CR can be used as a test to find out whether a constituent of a complex word is a lexeme.

With recourse to CR, Nagano (2013a) examines the morphological status of prefixes and points out that many English prefixes behave like lexemes. For example, the complex words with *super-* and *anti-* in (9) can undergo CR.

(9) a. super-__ and supra-national

b. anti-federalist and __-nationalist (opinions)

(Kenesei (2007: 274))

She also points out that lexical prefixes can be coordinated with what are incontrovertibly lexemes, as shown in (10).

(10) a. para- and alternative medics

b. fore- and mainmasts

(Bauer (2003: 37))

In (10a), the prefix *para-* and the lexeme *alternative* are coordinated. The examples in (9)

and (10) show that prefixes like *super-*, *anti-*, *para-*, and *fore-* have a lexemic status.[4]

On the other hand, functional prefixes such as *dis-* and *un-* behave differently from lexical prefixes in CR. Nagano (2013b) shows this point based on the example in (11a). Similar examples can be found in the literature as in (11b).

(11) a. * Mary un- and re-tied her laces. (Sadler and Arnold (1994: 208))

b. * I do not know if he should be dis- or encouraged. (Scalise (1984: 75))

In (11b), *discouraged* and *encouraged* are coordinated and the identical part *couraged* is deleted from the former, yielding an ungrammatical expression.

In this way, prefixes can be classified into lexical and functional types. Given the two groups of prefixes, we can refine Emonds' (2005) AR Analysis of prefixation by limiting its application to functional prefixes. In addition, the combination of Nagano (2013a, 2013b) and Emonds (2005) opens the possibility of a new approach to prefixation and, further, to the division of labor in morphology, as discussed in detail in the next section.

3.4. Proposal: The Resolving Analysis

At the beginning of the last section, I pointed out that Emonds' (2005) AR analysis can be applied only to functional prefixes, which can be fully characterized by syntactic features. In addition, referring to Nagano (2013a, 2013b), I showed the classification of prefixes in (12), which indicates that not all prefixes are functional.

(12) Lexical Prefixes

a. Evaluative Prefixes: *mal-*, *pseudo-*, *super-*, etc.

[4] Note that boundness does not indicate functionality. See Section 2.2 for this issue.

b. Spatio-temporal Prefixes: *circum-*, *inter-*, *pre-*, etc.

c. Quantitative Prefixes: *bi-*, *multi-*, *semi-*, etc.

Functional Prefixes

d. Negative Prefixes: *de-*, *non-*, *un-*, etc.

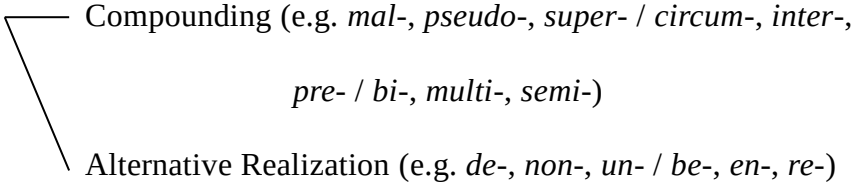
e. Aspectual Prefixes: *be-*, *en-*, *re-*, etc.

(= (6))

Given this classification, we can say that negative and aspectual prefixes can be analyzed as alternative realizations of certain syntactic features related to negation or aspect.[5] On the other hand, the rest of the prefixes in (12) require a different treatment; they should participate in a process other than AR. In order to identify the process, recall from the last section that the prefixes have the status of lexemes. This means that they have purely semantic features *f* and are inserted at the level of Deep Insertion. Thus, combining a lexical prefix with a lexeme is counted as compounding.

The above consideration leads to a new approach to prefixation. That is, prefixation in English is not a homogeneous process; rather, it should be resolved into the two processes of compounding and AR, as schematized in (13). Let us call this approach to prefixation the "Resolving Analysis."

(13) Resolving Analysis of Prefixation in English



[5] The prefix *mis-*, which is analyzed in Emonds (2005) but is not listed in (12), can safely be placed with the negative prefixes, as its feature composition [MANNER, NEG, EVAL] suggests. Plag (2003: 99) regards *mis-* as a close relative of negative prefixes.

This analysis has an important consequence. If prefixation is either compounding or AR, which also implements inflectional morphology, then no part of prefixation resides in derivational morphology, contrary to the general view of morphological processes. In other words, our proposal can retrieve prefixation from derivational morphology.[6] The proposed analysis is promising in that it provides a new way to explore the nature of prefixes and prefixation.

Note, however, that there still remains another set of controversial prefixes whose lexical status was not explicitly examined in Emonds (2005) or Nagano (2013a, 2013b). The set includes *on-*, *out-*, *over-*, *under-*, and *up-*, among others, which are formally identical to prepositions. If some of them participate in derivational processes, they will challenge the Resolving Analysis. Thus, we need to examine whether prepositional prefixes are also involved in either compounding or AR to complete the proposed analysis. With this background, we will extend the analysis to prepositional prefixes in subsequent sections.

3.5. Syntactic and Semantic Differences between Prepositional Prefixes and Post-Verbal Particles

Let us first examine whether Emonds' (2005) analysis can be applied to prepositional prefixes as a whole. Recall that Emonds (2005) equates prefixes with post-verbal particles and assigns them the category P (see Section 3.2). Given that prepositional prefixes are formally identical to prepositions, one may think that they clearly belong to the category P and are likely to be covered by the AR analysis as it stands. If so, the prepositional prefix of a P-V verb will be analyzed as an alternative realization of the post-verbal particle of the V-P counterpart. This analysis predicts that a V-P verb and its inverted counterpart P-V verb

[6] This has a further implication for the division of labor in morphology. I will discuss this point in Section 3.8.

are basically the same except for where the syntactic features in the post-verbal position are realized; in the V-P combination, they are realized as a post-verbal particle, and in the P-V verb, they are realized as a prefix. However, this is not (always) the case; the two expressions [P-V] and [V-P] are in fact different semantically and syntactically.

First, V-P verbs and their P-V counterparts are different in terms of semantics. Let us consider *sell up* and *upsell*. If the AR analysis can be straightforwardly applied to verbs with prepositional prefixes, *up* in *upsell* alternatively realizes the same syntactic features as those realized by the post-verbal particle *up* in *sell up*. This would mean that the two forms are characterized by the same syntactic features; in other words, the two forms would have the same meaning. However, the two forms do not share the same meaning. The V-P verb *sell up* in (14b) has the meaning of "to sell your home, possessions, business, etc., usually because you need the money, are mobbing to another place or are stopping work," but *upsell* does not share this meaning. Instead, *upsell* in (15b) has the meaning of "to persuade a customer to buy more products or a more expensive product than they originally intended." In this way, *sell up* and *up sell* are semantically different.

(14) *sell up*

a. 'to sell your home, possessions, business, etc., usually because you need the money, are moving to another place or are stopping work'

b. We decided to sell up everything and buy a farm.

(*OPhVD*, s.v. *sell up*)

(15) *upsell*

a. 'to persuade a customer to buy more products or a more expensive product than they originally intended'

b. You can usually upsell to about half the customers.

(*OALD*[9], s.v. *upsell*)

The semantic differences can be observed in the combinations of *set up* and *upset*, *come over* and *overcome*, and *do over* and *overdo*, as in (16)-(21).[7]

(16) *set up*

a. 'to provide sb with the money that they need in order to do sth'

b. A bank loan helped to set him up in business.

(*OALD*[9], s.v. *set*)

(17) *upset*

a. 'to make sb / yourself feel unhappy, anxious or annoyed'

b. This decision is likely to upset a lot of people.

(*OALD*[9], s.v. *upset*)

(18) *come over*

a. 'to visit sb for a short time, usually at their home'

b. Our new neighbours came over to our house last night.

(*OPhVD*, s.v. *come over*)

(19) *overcome*

a. 'to succeed in dealing with or controlling a problem that has been preventing you from achieving sth'

b. She overcame injury to win the Olympic gold medal.

[7] Note that the expression *do over* has the same meaning as *redo*; both expressions mean 'to do something again' (*OALD*[9]) (Akiko Nagano (personal communication)). This means that the feature [AGAIN] can be alternatively realized not by *over-* but by *re-* in pre-verbal position (*redo*). That is, *over* in *overdo* is not related to the post-verbal particle *over*, which realizes the feature [AGAIN].

(*OALD*[9], s.v. *overcome*)

(20) *do over*

a. ‘to do sth again’

b. I’m glad the campaign was successful, but I wouldn’t want to do it over.

(*OPhVD*, s.v. *do over*)

(21) *overdo*

a. ‘to do sth too much; to exaggerate sth’

b. She really overdid the sympathy.

(*OALD*[9], s.v. *overdo*)

In addition, V-P verbs and their P-V counterparts are syntactically different. If P is a Syntacticon item and inserted by Syntactic Insertion or PF Insertion, the verb to which P attaches functions as the head of the structure at the level of Deep Insertion. This means that P does not affect the argument structure of the verb. Thus, we can predict that V-P verbs and their P-V counterparts have the same argument structure. Contrary to this prediction, *come over* and *overcome*, for example, have different argument structures, as in (22).

(22) a. Our new neighbours came over to our house last night. (= (18b))

b. She overcame injury to win the Olympic gold medal. (= (19b))

The example in (22a) indicates that *over* does not have an effect on the argument structure of the verb *come*; as with the simple verb *come*, *come over* functions as an intransitive verb. Unlike *come over*, *overcome* in (22b) functions as a transitive verb; the verb takes *injury* as

its object. The difference in argument structure indicates that *over* in *overcome* is inserted at the beginning of the derivation (see also Naya (2015)). Therefore, we cannot analyze *over* in *overcome* as alternatively realizing the features that are realized by *over* in *come over*.

The examples we have observed in this subsection challenge the assumption that the prepositional prefix in a P-V verb alternatively realizes ceratin syntactic features in the post-verbal position that are realized by P in a V-P combination. Accordingly, it is reasonable to consider alternative approaches to P-V verbs. A promising approach is to analyze prepositional prefixes in P-V verbs as lexemes, as in the analysis of lexical prefixes. That is, P-V verbs are formed by compounding. To explore this approach, let us first examine whether prepositional prefixes also have the characteristics of lexemes. The next section shows that many of them behave like lexemes but (at least) one prepositional prefix, *out-*, has a peculiar property.

3.6. The Classification of Prepositional Prefixes

3.6.1. Lexical Prepositional Prefixes

To examine whether prepositional prefixes are lexemes or functional categories, let us observe their behaviors in CR, as in Section 3.3. The observation shows that many of them have the characteristics of lexemes. For example, in (23a), *up-country* and *low-country* are coordinated and the common part of the conjuncts, *country*, is deleted from the first conjunct. In (23b), *up-* itself is the common part, and is deleted in the second conjunct.[8]

(23) *up-*

a. Geographically, the research focuses on two geographical areas, up- and

[8] Our informants point out that (23b) is not as good as (23a) but is still acceptable. This difference perhaps arises because unlike the case of *up-country* and *low-country*, *update* does not clearly contrast with *upload*.

low-country.

(Dulna Karunarathna (2014) Imaging the Role of Women in Changing Social-Cultural Contexts, p. i)

b. ? The 2016 results are being updated and loaded to the events page.

(http://firstrespondergames.com/)

Given that these examples are grammatical, we can say that the prepositional prefix *up-* has the status of lexeme. The same is true of the prepositional prefixes in (24)-(26).

(24) *over-*

a. … its importance has been both over- and underestimated, …

(Brian L. Silver (1998) *The Ascent of Science*, p. xiii)

b. Hotelrooms could be over- and doublebooked!

(https://www.tripadvisor.com.au/ShowUserReviews-g187870-d233932-r195134556-Hotel_Tre_Archi-Venice_Veneto.html)

c. I now know how much I overate and drank in my previous life!

(http://www.sterlingclinics.co.uk/ian-lost-6st-in-23-weeks/)

(25) *under-*

a. [Control] of capital allocation to prevent under- and over-commitments to physical plant. (*OED*, s.v. *over-*)

b. … the under and fore-part of the cheek (*OED*, s.v. *orbitar*)

(26) *on-*

Much of the latter capability is due to the fighter's .. ability to fuse information gathered by on and offboard sensors. (*OED*, s.v. *off-board*)

These examples indicate that many prepositional prefixes are lexemes. However, *out-* is a peculiar prefix in that it can behave either as a lexeme or a functional category, as shown in the next subsection.

3.6.2. Peculiarity of Prepositional Prefixes: Dual Properties of *out-*

This subsection shows that *out-* has a dual property in that it behaves as both a lexeme and a functional item. Let us first observe the examples in (27), where *out-* behaves as a lexeme. In (27a), *out-door* and *in-door* are coordinated and the shared part *door* is deleted in the left conjunct. Similarly, in (27b), *out-board* and *in-board* are coordinated and the common constituent *board* is deleted in the left conjunct. The resultant expressions in (27a, b) are grammatical, and thus we can treat *out-* as a lexical prefix.

(27) a. The appointment of a labour master to superintend the out and in-door labour of the poor of the union. (*OED*, s.v. *labour*, n)

b. Sometimes it [*sc*. rebuilding] is only taken to be the unmoulding of the frame and the stripping of the out and in-board work.(*OED*, s.v. *outboard*)

In addition, *out-* also behaves as a functional prefix as shown in (28). In (28a), the two *out*-verbs *outrun* and *outswim* are coordinated. Unlike the examples in (27), *out-* in the second conjunct resists CR, as shown in (28b). Thus, in this case, we can regard this prefix as a functional prefix.

(28) a. Mary outran and outswam Bill.

b. * Mary out-ran and -swam Bill.

(Sadler and Arnold (1994: 208), underlining mine)

The examples in (27) and (28) show that the prefix *out-* is peculiar in that it can serve both as a lexeme and as a functional prefix.

Note here that *out-* does not behave in a random way. On the contrary, its behavior is regular in corresponding to the semantics of *out-*. When *out-* behaves as a lexeme, it has a spatial meaning. For example, *out-* as used in *outdoor* in (27a) is related to 'out of doors.' Meanwhile, when it behaves as a functional item, it has the meaning related to comparison, which can be expressed as 'surpass.' More precisely, *outrun and outswim Bill* in (28a) means 'run and swim faster or farther than Bill.' Given this correspondence between behavior and semantics, we can obtain the following generalization:

(29) The prepositional prefix *out-* with spatial meanings serves as a lexeme. *Out-* with the sense of 'surpass' serves as a functional item.

This section showed that prepositional prefixes can be classified into lexical and functional ones as follows:

(30) a. Lexical Prepositional Prefixes

up-, *over-*, *under-*, *on-*, *out-* (with spatial meanings)

b. Functional Prepositional Prefix

out- (with 'surpass' meanings)

The next question to address is what morphological process they participate in. The next section extends the Resolving Analysis to prepositional prefixes, showing the validity of the analysis.

3.7. Prepositional Prefixes and Morphological Processes

3.7.1. Alternative Realization of *out-* 'surpass'

As we have seen in Section 3.6.2, *out-* with a spatial sense serves as a lexeme, as in (31). Accordingly, *out-* in this sense undergoes compounding. More precisely, *out-* undergoes Deep Insertion.

(31) Lexical *out-*

a. the out and in-door labour (see (27a))

b. the out and in-board work (see (27b))

In contrast, the prefix *out-* as used in the meaning of 'surpass,' which can be exemplified in (32), is introduced to syntactic computation by a different process.

(32) Functional *out-*

Mary outran and outswam Bill. (= (28a))

If the Resolving Analysis is correct, Emonds' (2005) AR Analysis applies to functional *out-*. Under the AR Analysis, functional *out-* should be a phonological realization of some syntactic features. This raises these question of the syntactic features that are realized by functional *out-*. To identify the syntactic features, let us observe the meanings of the verbs with *out-* more closely than we did in Section 3.6.2. The definitions of *out-*, *outrun*, and *outswim* are shown in (33), (34a), and (34b), respectively.

(33) *out-*: '(in verbs) greater, better, further, longer, etc.' (*OALD*[9], s.v. *out-*)

(34) a. *outrun* 'to run faster or farther than sb/sth' (*OALD*[9], s.v. *outrun*)

b. *outswim* 'To surpass or excel in swimming, swim faster or farther than.'

(*OED*, s.v. *outswim*)

They show that *out-* adds to the base verbs the meaning of surpassing or superiority. The verbs *outrun* and *outswim* are related to superiority in the speed or distance of running or swimming. Given these examples, it is safe to say that the meanings of functional *out-* can be reduced to "better." In fact, the expression *swim better than plankton* in (35a) can be paraphrased as *outswim plankton* without major semantic change, as in (35b).

(35) a. … animals that aren't fish but can still <u>swim better than</u> plankton

(Susan Milius (2007) 'What's going on down there?,' *Science News* 171.7, 107-109; underlining mine)

b. … animals that aren't fish but can still <u>outswim</u> plankton

Thus, we can say that the phrase *out*-V X corresponds to the phrase V *better than* X, as schematized in (36).

(36) *out*-V X ---- V *better than* X

This correspondence indicates that functional *out-* and *better* have the same feature complex. Interestingly, *better* is defined using the term *badly*, as follows:

(37) *better*

in a more excellent or pleasant way; not as badly (*OALD*[9], s.v. *better*, adv.)

Here, it is helpful to recall the syntactic features associated with the prefix *mis*-, because the prefix shares syntactic features with the manner adverb *badly* (see Section 3.2). The features are given in (38).

(38) *mis*-: [MANNER], [NEG], [EVAL]

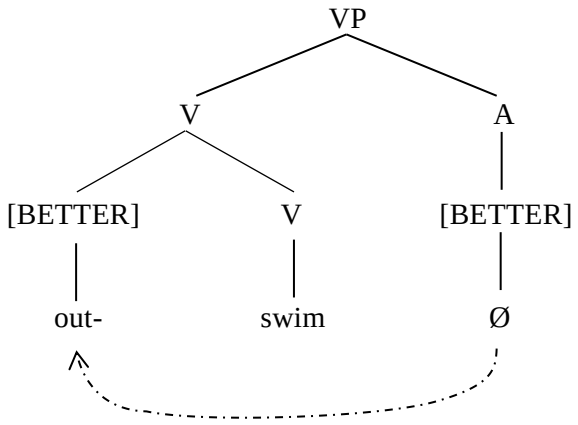
Given that *good* is the antonym of *bad*, the feature complex related to *good* contains not [NEG] but [POSITIVE]. Since *better* is the comparative form of *good*, *better* also contains the comparative feature [COMPAR] (see Section 2.5.4.2). Thus, it is reasonable to assume that the functional prefix *out*- 'surpass' alternatively realizes the following feature complex:

(39) Syntactic Features of *out*- 'surpass'

[MANNER, EVAL, COMPAR, POSITIVE, …]

For expository purposes, let us use "[BETTER]" to represent this feature complex in what follows. Given the discussion so far, the derivational process of *out*-V can be represented in (40).

(40) *outswim*



First, [BETTER] occurs in the post-verbal position. After Spell-Out, [BETTER] is alternatively realized in the pre-verbal position with the phonological form *out-*. The analysis proposed in this section is supported by the evidence provided in the following subsection.

3.7.2. Evidence

3.7.2.1. Zero-Nominalization

Given the proposed analysis, we can make an interesting prediction. If a prepositional prefix is inserted before Spell-Out, the whole of the relevant complex verb can undergo the processes that occur before Spell-Out; by contrast, if it is inserted after Spell-Out (i.e., it is inserted by AR), the relevant complex verb cannot undergo such processes. One of the pre-Spell-Out processes is zero-nominalization or V-to-N conversion. Given that zero-nominalization is generally regarded as a derivational process, which is assumed to occur prior to Spell-Out in Emonds' (2000) model, the process can be applied only to verbs with lexical prepositional prefixes.[9] Thus, the prediction can be restated as follows:

(41) Prediction

Verbs with lexical prepositional prefixes can undergo zero-nominalization but those with functional prefixes (i.e., *out-* 'surpass') cannot.

This prediction is correct. First, let us observe verbs with lexical prepositional prefixes. The verb *overdrink*, for example, has the meaning in (42a). This verb can be turned into a

[9] In Chapter 5, I will propose that zero-nominalization is the process where a verb is combined with a silent semi-lexical noun in the Dictionary. This means that the silent semi-lexical noun undergoes Deep Insertion. Accordingly, the idea that V-to-N conversion occurs prior to Spell-Out is still valid under my proposal. See Chapter 5 for a detailed discussion of V-to-N conversion.

noun, maintaining the meaning, as shown in (42b).

(42) a. *overdrink*$_{V}$

‘To drink more than one should (usually with reference to alcohol); to carry on drinking until one is drunk.’ (*OED*, s.v. *overdrink*, v.)

b. *overdrink*$_{N}$

‘Excessive drinking, drunkenness.’ (*OED*, s.v. *overdrink*, n.)

The same pattern can be observed in the verbs *update* and *on-flow*, as shown in (43) and (44), respectively.

(43) a. *update*$_{V}$

‘To supply (a person) with the most recent information; to bring (a person) up to date.’ (*OED*, s.v. *update*, v.)

b. *update*$_{N}$

‘The action or result of updating; the supplying of new information, data, etc.’ (*OED*, s.v. *update*, n.)

(44) a. *on-flow*$_{V}$

‘To flow or move onward.’ (*OED*, s.v. *on-flow*, v.)

b. *onflow*$_{N}$

‘The action or fact of flowing onward; an onward flow or course.’ (*OED*, s.v. *onflow*, n.)

In contrast to verbs with lexical prepositional prefixes, those with the functional prepositional prefix *out-* cannot undergo zero-nominalization. For example, the verbs

outrun and *outswim*, which have a 'surpass' interpretation, cannot undergo V-to-N conversion. As shown in (45), the verb *outrun* has the meaning of 'surpass.' However, the nominal counterpart can only have a spatial meaning, as shown in (46). The same is true of the verb *outswim*, as in (47) and (48).

(45) *outrun*$_V$

'To outdo or outstrip in running, to run faster or farther than; to leave behind by superior speed; hence, to escape or elude.' (*OED*, s.v. *outrun*, v.)

(46) *out-run*$_N$

a. 'The act or fact of running out; spec. the outward run of a sheepdog.' (*OED*, s.v. *out-run*, n.)

b. * 'an act of outrunning; an act of running better or faster than (someone)'

(47) *outswim*$_V$

'To surpass in swimming; to swim better, faster, or further than.'

(*OED*, s.v. *outswim*, v.)

(48) *outswim*$_N$

* 'an act of outswimming; an act of swimming better or faster than someone'

What is more, when a verbal form is ambiguous between 'surpass' and other readings, the nominal counterpart cannot have the 'surpass' sense. For example, the verb *outshoot* has both spatial and 'surpass' readings, as indicated in (49a). However, although its nominal counterpart has a spatial meaning, it lacks the meaning related to surpassing, as the definition in (49b) shows.

(49) a. *outsthoot*$_{V}$

(i) ‘To shoot outwards, project.’

(ii) ‘To surpass in shooting; to shoot further or better than.’

(*OED*, s.v. *outshoot*, v.)

b. *outshoot*$_{N}$

‘Something that shoots out or projects; a projection or extension.’ / ‘The action or an act of shooting or thrusting outwards.’

(*OED*, s.v. *outshoot*, n.)

Similar examples are given in (50)-(51).

(50) a. *out-throw*$_{V}$

(i) ‘To throw or thrust out or outwards; to cast out or expel.’

(ii) ‘To surpass in throwing; to throw further than.’

(*OED*, s.v. *out-throw*, v.)

b. *out-throw*$_{N}$

‘That which is thrown out; an ejection or emission; output or production.’

(*OED*, s.v. *out-throw*, n.)

(51) a. *outride*$_{V}$

(i) ‘To ride out’

(ii) ‘To outdo in riding, to ride better, faster or further than; to leave behind or outstrip by riding.’

(*OED*, s.v. *outride*, v.)

b. *outride*$_{N}$

‘The act of riding out, a ride out; an excursion.; …’(*OED*, s.v. *outride*, n.)

These examples support the claim that functional *out*- is inserted after Spell-Out.

3.7.2.2. Incompatibility with *better* / *faster*

Given that the prefix *out*- phonologically realizes the feature [BETTER], the feature does not need to be realized in its canonical position. If so, we can predict that *out*- verbs do not co-occur with *better* and *faster*. This prediction is borne out by the following example:

(52) * John always { outruns / outswims } Mary { better / faster }.

As predicted, this example shows that the verbs *outrun* and *outswim* are not compatible with *better* and *faster*. This incompatibility supports the proposed analysis of functional *out*-.

3.8. Consequence: The Function of Derivational Morphology

Combining Emonds' (2005) and Nagano's (2013a) studies, this chapter has proposed that prefixation in English can be resolved into compounding and AR. This proposal highlights the important consequence that prefixation has no role in derivation. That is, prefixes lack the category-changing function, which resides in derivational morphology. This view corresponds to Nagano's (2011b) analysis of so-called verbalizing prefixes, such as *be*-, *de*-, and *dis*-. Although these prefixes allegedly determine the category of the complex words that they form, she argues that the prefixes actually attach to denominal and deadjectival verbs, as indicated in (53) (see also Marchand (1969: 137) and Kastovsky (1986, 1996, 2006: 215), for the Right-Headed Analysis).

(53) a. [*be*-[[*fool*]$_{N}$]$_{V}$]$_{V}$

b. [*de*-[[*louse*]$_N$]$_V$]$_V$

c. [*dis*-[[*burden*]$_N$]$_V$]$_V$

d. [*en*-[[*cage*]$_N$]$_V$]$_V$

(Nagano (2011b: 62))

Under her analysis, the prefixes are not responsible for category determination. Consequently, Nagano's analysis supports the above proposal.

However, there are still other prefixes, which apparently have the category-changing function. Plag (2003: 99) points out that denominal and deverbal *anti-* words behave like adjectives, as in (54). In addition, the prefix *pro-* behaves in a similar way, as shown in (55).[10, 11]

(54) a. anti-war movement

b. an anti-freeze liquid

c. an anti-freeze liquid

(Plag (2003: 99))

(55) a. pro-popery Ministry

b. pro-transsubstantiation passage

c. pro-Slavery action

(Marchand (1969: 186))

Semantically, *anti-* and *pro-* are used to specify an attitude (Bauer et al. (2013: Section 18.3))

[10] I would like to express my gratitude to an anonymous reviewer of ELSJ 10th International Spring Forum 2017 for pointing out that some prefixes, including *anti-* and *pro-*, appear to change the categories of the words they attach to.

[11] The underlines in the examples in this section are all mine.

and can be regarded as antonyms (i.e., 'opposed to; against' vs. 'in favor of').[12] Thus, an *anti*- word and a *pro*- word can be coordinated, as in (56).

(56) a. pro-educational and anti-slavery parties (Marchand (1969: 186))

b. Are you pro-abortion or anti-abortion? (Plag (2003: 99))

Note that the example in (56b) shows that *pro*- and *anti*- words behave like predicative adjectives. If these prefixes do change the category of their bases, they will challenge the view that prefixation lacks the category-changing function.

This section examines whether or not the prefixes *anti*- and *pro*- actually have the category-changing function.[13] It will be shown that these "adjectivalizing" prefixes are not necessarily involved in category-changing in many cases. First, they can violate the Lexical Integrity Principle, which can be observed not in derivatives but in compounds (Section 3.8.1). Second, unlike genuine derivational affixes, the prefixes do not always form adjectives; they can form nouns as well (Section 3.8.2). Third, *anti*- and *pro*- "adjectives" are mainly used as prenominal modifiers (Section 3.8.3). Given that a noun can modify another noun without turning into an adjective, *anti-war*, for example, does not need to be an adjective to modify *movement*.

3.8.1. The Morphological Status of *anti*- and *pro*- Words

This subsection examines the morphological status of *anti*- and *pro*- words. If the

[12] Etymologically, both prefixes are non-native prefixes; *anti*- came from Greek and *pro*- from Latin. As current English prefixes, they can attach to both non-native words (e.g., *anti-hero*, *anti-communist*; *proform*, *pro-abortion*) and native words (e.g., *anti-clockwise*, *antibody*; *pro-war*, *pro-life*) (Lieber (2005: 388, 389)).

[13] Bauer (1983: 217) refers to the prefix *a*- as an example of category-changing prefixes. See Nagano (2016) for this prefix.

prefixes in question are derivational elements, the resultant words should be derivatives. In contrast to this prediction, *anti-* and *pro-* words behave like compounds. Unlike non-compounds including derivatives, compounds can go against the Lexical Integrity Principle (LIP) in certain environments. Recalll from Section 3.3 that genuine compounds can undergo CR, as in (57), but inflected words cannot undergo CR, as in (58).

(57) a. book-__ and newspaper-stands
b. gossip-__ and scandal-mongers
c. book-binders and __-sellers
(= (7))

(58) John walk*(ed) and danced. (= (8))

Applying CR to *anti-* and *pro-* words, we find that they behave in the same way as compounds, as observed in (59).

(59) a. anti-federalist and __-nationalist opinions (= (9))
b. pro-__ and anti-porn feminists (*OED*, s.v. *pro-sex*, with a modification)

In both examples, the *anti-* and *pro-* words modify the nouns (i.e., *opinions* and *feminists*, respectively) and so one may judge the *anti-* and *pro-* words as derived adjectives. However, the words behave like compounds under CR. These examples show that *anti-* and *pro-* words are compounds rather than derivatives. Therefore, the prefixes are not derivational elements.

Another example of the anti-LIP behaviors is that the *anti-* and *pro-* words allow word-internal anaphora, as in (60).

(60) a. Anti-Reagan$_i$ forces believe him$_i$ to be a threat.

b. Pro-Chomsky$_i$ linguists regard him$_i$ to be "the father of modern linguistics."

The pronoun *him* in (60a) can refer to *Regan*, a constituent of the *anti-* word. Likewise, *him* in (60b) can refer to *Chomsky* in the word *pro-Chomsky*. This fact indicates that the prefixes *anti-* and *pro-* form not derivatives but compounds. That is, *anti-* and *pro-* are involved not in derivation (i.e., category changing) but in compounding.

The examples observed in this section show that the words with *anti-* and *pro-* are not derivatives but compounds. This leads us to conclude that the prefixes are not adjectivalizing elements.

3.8.2. Input and Output Properties of *anti-* and *pro-* Prefixation[14]

This subsection shows that *anti-* and *pro-* lack the category-changing function by focusing on the categorial status of inputs and outputs of *anti-* and *pro-* prefixation. Before proceeding to the observation of *anti-* and *pro-* words, let us consider the cases of the category-changing and non-category-changing suffixes.

In the case of category-changing suffixation, the categorial status of the resulting words is generally determined by the suffix involved, as Williams (1981) illustrates. For example, the suffix *-er* exclusively forms nouns, as shown in (61).

(61) a. N > N: hat > hatter New York > New Yorker

b. V > N: speak > speaker cook > cooker

c. A > N: foreign > foreigner northern > northerner

[14] This section is a revised version of Naya (to appear).

These examples show that *-er* can attach to the three major lexical categories, namely, nouns, verbs, and adjectives, but the outputs of the suffixation are always nouns. In contrast, the diminutive suffix in Spanish maintains the categorial properties of its bases, as illustrated in (62).

(62) a. Adjective: *poco* *poquita*
'little'

b. Noun: *chica* *Chiquita*
'girl'

c. Adverb: *ahora* *ahorita*
'now'

(Di Sciullo and Williams (1987: 26))

As observed in these examples, the diminutive suffix "can attach to almost any part of speech [and] the resulting word belonging to the same category as the word to which the diminutive attaches" (Di Sciullo and Williams (1987: 26)).[15] This means that the suffix lacks the category-determining function.

Returning to *anti-* and *pro-*, they show the same pattern as the diminutive in (62) in many cases. The *OED* entries of *anti-* (prefix1) and *pro-* (prefix1) list 531 and 96 nonce words, respectively. Among them, the 470 instances of *anti-* words and the 93 instances of *pro-* words are classified according to the categorial properties of the inputs and outputs of the prefixation.[16] The results are shown in the table in (63).

[15] Di Sciullo and Williams (1987) attribute this observation to Jaeggli (1980).

[16] I excluded 58 instances of the *anti-* words and 3 instances of the *pro-* words, because the *OED* does not have entries for their base words, and we could not identify their categorial properties. I also excluded the three *anti-* words in (i) for the following reasons:

(63) Categorial Properties of Inputs and Outputs of *anti-* and *pro-* Prefixation

	category-maintaining		category-changing (?)
	Group (i): N > N	Group (ii): A > A	Group (iii): N > A
anti-	214 (Approx. 46%)	187 (Approx. 40%)	69 (Approx. 15%)
pro-	32 (Approx. 34%)	38 (Approx. 41%)	23 (Approx. 25%)
Total	246 (Approx. 44%)	225 (Approx. 40%)	92 (Approx. 16%)

The table shows that in 471 instances (approximately 84%) in total, *anti-* and *pro-* attach to nouns and adjectives without changing their categories. Group (i) includes the examples in (64) and (65).

(64) N > N

a. ... a crowd of anti-emperors in the provinces.

b. ... anti-globalization appears unfamiliarly hegemonic here ...

c. ... represent ... a desperate and embittered anti-science.

(*OED*, s.v. *anti-*)

(65) N > N

a. ... this sudden legislative campaign by the pro-abortionists.

b. This trumpet blare of Triumphant Democracy ... almost unnerves us into

(i)

a.	anticonstitutionally	Adv: 1885	constitutionally	Adv: 1745	
b.	anti-Bonapartist	N: 1814	Bonapartist	N: 1815	A: 1869
c.	anti-bacterial	N: 1897	bacterial	A: 1879	

In (ia), *anti-* is attached to an adverb. In (ib), the *anti-* form was attested earlier than the word *Bonapartist* was. In (ic), *anti-* seems to attach to an adjective, thereby yielding a noun. These examples are interesting, but I leave them for future research.

pro-capitalism.

c. ... by the ceasing of Mr. Ralph Skinner, Pro-Warden, ...

(*OED*, s.v. *pro-*)

In the examples in (64), *anti-* attaches to the nouns, namely, *emperors*, *globalization*, and *science*, yielding nouns. Likewise, *pro-* attaches to the nouns *abortionists*, *capitalism*, and *warden* in (65), which forms nouns. Group (ii) includes the following examples:

(66) A > A

a. ... the antijewish party ...

b. ... their anti-carnivorous principles.

c. This anti-ecclesiastical partisan.

(*OED*, s.v. *anti-*)

(67) A > A

a. ... the pro-educational, and anti-slavery parties ...

b. This procompetitive government agency ...

c. ... the Norwegians so pro-allied in their sentiments ...

(*OED*, s.v. *pro-*)

Anti- and *pro-* in these instances attach to adjectives and the resultant words are also adjectives. Note that the bases of the examples in (66) and (67) are derived adjectives. Given that they are headed by adjectival suffixes (i.e., *-ish*, *-ous*, *-al*, *-ive*, and *-ed*), it is natural that the *anti-* and *pro-* words in (66) and (67) are adjectives.

Group (ii) also includes the instances in (68) and (69), where the base words lack adjectival suffixes; therefore, the prefixes appear to function as adjectivalizers.

(68) a. The anti-humanist symposium.

b. The ‘Nike B’ is designed as an antimissile missile ...

c. These anti-patriot flings of Lessing.

(*OED*, s.v. *anti-*)

(69) a. He was neither anti-Italian nor pro-Arab.

b. The telegraph says nothing of any pro-German demonstration or declaration.

c. I tell you I’m pro-slave.

(*OED*, s.v. *pro-*)

However, these examples do not provide evidence for the category-changing function of *anti-* and *pro-*. This is because they can be analyzed in a way similar to the analysis of so-called verbalizing prefixes by Nagano (2011b), which is briefly mentioned in the beginning of this section (see (53)). That is, the *anti-* words in (68) are formed by attaching the prefix to *denominal adjectives*. In fact, the *OED* shows that the base words in these instances can be used as not only nouns but also adjectives. Importantly, the adjectival usages were attested earlier than *anti-* words, as indicated in (70).

(70)	a.	anti-humanist	1904	humanist	N: 1589	A: 1790
	b.	anti-missile	1956	missile	N: 1606	A: 1610
	c.	anti-patriot	1870	patriot	N: 1577	A: 1649

For example, (70a) shows that the word *humanist* occurred as a noun in 1589. It came into use as an adjective in 1790, as in (71).

(71) Paul of Samosate was the first proposer of the humanist notion.

(*OED*, s.v. *humanist*)

On the other hand, *anti-humanist* occurred in 1904. That is, *humanist* had been used to modify nouns before the *anti-* form appeared. Thus, the prefix in *anti-humanist* can be analyzed as attaching to the adjective *humanist*. Given that *humanist* can be used as an adjective without *anti-*, we do not need to attribute the adjectivalizing function to the prefix.[17] The same is true with *pro-* words. The data in (72) indicate the dates of the first attested examples of *pro-* words and the nominal and adjectival counterparts of the base words. They show the same pattern as that found in (70).

(72)	a.	pro-Arab	1911	Arab	N: a1287	A: ?1520
	b.	pro-German	1864	German	N: a1387	A: 1536
	c.	pro-slave	1856	slave	N: c1290	A: a1567

Therefore, the examples in (68) and (69) are not problematic to the view that prefixes lack the category-changing function.

Group (iii) in Table 1, however, includes the examples where the prefix possibly changes the nouns into adjectives. For example:

(73) a. ... an anti-bank man.

b. ... the anti-business speeches of the President ...

(OED, s.v. amti-)

[17] The *OED* entry regards the word *humanist* as an adjective, but it is also controversial whether the word modifying a noun is an adjective; nouns can modify nouns, as will be discussed in Section 3.8.3.

(74) a. ... the pro-Annexation discussions, ...

b. The pro-business faction

c. ... Pro-gun lobbyists ...

(*OED*, s.v. *pro-*)

Unlike in the case of (68) and (69), the base words in (73) and (74) are, according to the *OED*, used only as nouns. For example, the *OED* entry of *bank* labels the word as just a noun. If *bank* lacks the adjectival usage, one may think that we have no choice but to ascribe the adjectival function to *anti-* in these examples. In this sense, the prefixes in the words in Group (iii) may not be compatible with the view that prefixation is not responsible for category changing. We will closely examine the examples in Group (iii) in Section .

This section has shown that *anti-* and *pro-* behave in the same way as diminutives in many instances. The prefixes can attach to nouns and adjectives without category changing. This indicates that the prefixes do not determine the categorial properties of the resultant words of prefixation. However, the examples in Group (iii) appear to be adjectives that are formed by attaching the prefixes to nouns. If the prefixes do change the categories in these examples, they are problematic for our view that prefixes do not have the category-determination function. The next subsection examines whether they are actually capable of changing nouns into adjectives.

3.8.3. The "Adjectival" Use of *anti-* and *pro-* Words

In the last subsection, we extracted the examples where *anti-* and *pro-* appear to change nouns into adjectives. This section argues that many of the examples do not counter the view that the prefixes do not determine the category of the complex words they form, by showing that the relevant words are not necessarily analyzed as adjectives.

Let us first classify the examples relevant to this section. Group (iii) in Table 1 includes 69 *anti-* "adjectives" and 23 *pro-* "adjectives." These examples can be further classified according to whether they are attributive or predicative "adjectives." The results of the classification are indicated in the table in (75).

(75) Classification of "Adjectival" *anti-* and *pro-* Words

	attributive	predicative
anti-	68 (Approx. 99%)	1 (Approx. 1%)
pro-	16 (Approx. 70%)	7 (Approx. 30%)
Total	84 (Approx. 91%)	8 (Approx. 9%)

This table shows that as many as 84 instances (approximately 91%) in total are used as attributive (i.e., pre-nominal) modifiers, as exemplified in (76)-(79).

(76) a. ... an anti-bank man.

b. ... the anti-business speeches of the President ...

(= (73))

(77) a. The genuine anti-art bias ...

b. ... any other anti-pollution measure ...

(*OED*, s.v. *amti-*)

(78) a. ... the pro-Annexation discussions, ...

b. The pro-business faction

c. ... Pro-gun lobbyists ...

(= (74))

(79) a. ... a pro-abortion Republican, ...

b. ... a stable, pro-business government ...

c. Contrasting antisex and prosex attitudes.

(*OED*, s.v. *pro-*)

The *OED* labels these pre-nominal words as adjectives. Note, however, that nouns can modify their subsequent nouns without turning into adjectives, as exemplified in (80) and (81).[18]

(80) a. an iron rod, life imprisonment, a Sussex Village

b. a metal sheet, clay soil, a top drawer, a garden fence, a morning train, a night sky, a board member

(Quirk et al. (1985: 1330, 1332))

(81) brain death, bullet train, domino theory, language laboratory

(Bauer (1983: 204))

Given these examples, the pre-nominal examples of *anti-* and *pro-* words in (76)-(79) are not necessarily adjectives. Thus, they do not provide strong evidence for the category-changing function of the prefixes.

One may argue that the pre-nominal *anti-* and *pro-* words are attributive adjectives derived from nouns. In fact, denominal adjectives called relational adjectives like those in (82) cannot be used as predicates, as in (83) (see also Levi (1975)).

[18] It is controversial whether the sequence N-N is a compound or a phrase. See Bauer (1998), Payne and Huddleston (2002), Bell (2011), Shimamura (2014: section 3.2; 2015), Nishimaki (2015: Appendix; 2017) for this issue.

(82) a. industrial output

b. cellular structure

c. senatorial leadership

d. budgetary item

(Beard (1995: 188))

(83) a. federal tax

b. * this tax is federal

(Beard (1995: 188))

If the *anti-* and *pro-* words in (76)-(79) are relational adjectives, *anti-* and *pro-* play the same role as the suffixes *-al*, *-ular*, and *-ary* in (82). In this case, *anti-* and *pro-* need to be analyzed as adjectivalizers. However, to be relational adjectives is not a necessary condition for the modification of nouns. Beard (1995: 188) highlights that the expressions in (82) can be paraphrased as those in (84).

(84) a. industry output

b. cell structure

c. senate leadership

d. budget item

(Beard (1995: 188))

Importantly, the left-hand nouns in (84) serve as modifiers in spite of the lack of adjectival suffixes.[19] As with the case of (80) and (81), the examples in (84) again show that pre-

[19] The literature has pointed out that relational adjectives have noun-like properties (e.g., Beard (1995)). Thus, they are also called pseudo-adjectives (Levi (1975)). In addition, extending Fábregas's (2007) analysis, Cetnarowska (2013) argues that relational adjectives are, in fact, nouns

nominal modifiers are not necessarily adjectives. Thus, we do not need to conclude that *anti-* and *pro-* function as adjectivalizing prefixes.

It should be noted, however, that the *OED* entry of *anti-* includes *anti-physician*, which is used as a predicate, as in (85).

(85) Those who are for a Spring Fast, are not only anti-christian, but anti-physician.

(*OED*, s.v. *anti-*)

This word may not be compatible with our idea that *anti-* lacks the derivational function. However, note that the sentence in (85) contains another *anti-* word, *anti-christian*. This *anti-* word is an established word and, the *OED* gives it an independent entry. Given that *anti-christian* is an established word, it is not strange that the word acquires the adjectival usage through zero-derivation or conversion, as indicated in (86).

(86) $[X]_N \rightarrow [anti\text{-}X]_N \rightarrow [anti\text{-}X]_A$

I assume here that the environment where the adjective *anti-christian* occurs coerces *anti-physician* into functioning as an adjective. That is, the adjective-like property of *anti-physician* in (85) does not come from the prefix *anti-* but from the environment where the word occurs. The same will be true of the predicative use of *pro-* words; the predicative *pro-* words are used with other *pro-* words and/or *anti-* words, as observed in (87), though the three examples in (88) are exceptional.

(see also Cetnarowska (2015)). If they are nouns as Cetnarowska (2013) argues, it is not strange to assume that the prenominal *anti-* and *pro-* words are nouns. However, Cetnarowska's (2013) approach raises the question as to what role the adjectival suffixes in relational adjectives play. I leave this issue for future research.

(87) a. To be anti prohibition was to be pro alcoholism

b. If it were indeed a necessity of the situation to be pro-Boer or pro-British ... then as Britons we should be for the British, we admit.

c. When democracy is hit by foes abroad and nibbled at by foes within, organized labor is pro-war, anti-German, pro-democracy, anti-Bolshevik.

d. It is not either anti-Russian or pro-Turk—it is humane.

e. A letter was also found ... asking for a list of the democratic papers in the state, and information as to which of these papers 'are pro-war, which anti-war, and which on the fence.'

(*OED*, s.v. *amti-*)

(88) a. ... regarded as pro-communist.

b. Parisian newsapers[sic] ... feature battle dispatches written by correspondents with the Jewish forces, and editorial comment is consistently pro-Israeli.

c. Amyl nitrate and nitrite ... according to Midgley are pro-knock.

(*OED*, s.v. *pro-*)

Accordingly, the predicative use of *anti-* and *pro-* words is not problematic to the idea we are promoting.

To sum up, the *anti-* and *pro-* words that the *OED* labels as adjectives are not necessarily analyzed as adjectives. Most "adjectival" examples are attributively used. Given that a noun can attributively modify its subsequent noun, we do not need to consider such attributive examples of *anti-* and *pro-* words as adjectives. The "adjectival" uses also include predicative examples. In such examples, *anti-* and *pro-* words co-occur with other *anti-* and *pro-* words that are established words and that seem to have acquired adjectival

usage. Assuming that the predicative examples of *anti-* and *pro-* words are forced to behave like adjectives in such environment, we can attribute the adjective-like properties to other than the prefixes. Therefore, even in the cases where *anti-* and *pro-* words are considered to be adjectives in the *OED*, the prefixes do not function as genuine category-changing prefixes.

3.8.4. Prefixation and the Category Changing Function

Based on the examples of *anti-* and *pro-* words mainly from the *OED*, this section presented the following three facts. First, *anti-* and *pro-* words behave like compounds in that they violate the LIP, which means that they are not formed by derivation but compounding. Second, *anti-* and *pro-* can form nouns as well as adjectives. This indicates that the prefixes are not responsible for category determination. Finally, most of the apparent adjectival examples are used as pre-nominal modifiers. Given that nouns can be attributively used without turning into adjectives, such pre-nominal examples are not strong evidence for the category-changing function of the prefixes. These facts lead us to conclude that *anti-* and *pro-* are not capable of category changing. In addition, this conclusion confirms the validity of the Resolving Analysis.

Additionally, the conclusion strongly suggests that prefixation can be retrieved from derivational morphology. This simplifies the division of labor in morphology; that is, the category-changing function is attributed only to suffixation.

3.9. Summary

This chapter has examined prefixes and prefixation in English. Emonds (2005) offers a new approach to prefixation, whereby prefixes are analyzed as prepositions occurring inside words. Importantly, they are syntactically the same elements as post-verbal particles, which

consist only of syntactic features. Under this analysis, prefixes are regarded as semi-lexical prepositions listed in the Syntacticon. However, not all prefixes can be fully characterized by syntactic features. Nagano (2011a, 2013a, 2013b) shows that although some English prefixes (e.g., *de-*, *non-*, *en-*, *re-*, etc.) are indeed functional, many of them are best analyzed as lexemes.

The combination of Emonds' (2005) and Nagano's (2011a, 2013a, 2013b) studies suggests that the class of prefixes is not homogeneous and neither is prefixation; to be precise, prefixation can be resolved in such a way that the attachment of functional prefixes is AR, an inflection-like process, and that of lexical categories is compounding.

This analysis can also capture the properties of prepositional prefixes, which are not explicitly studied in Emonds (2005) and Nagano (2011a, 2013a, 2013b). Prepositional prefixes basically behave as lexical categories when they have spatial meanings. In this case, prefixes are prepositions in the Dictionary and undergo Deep Insertion. As a result, they form compounds. In contrast, (at least) *out-* with the meaning of 'surpass' behaves differently from these prepositional prefixes in that complex words containing it do not tolerate CR. The functional prefix *out-* 'surpass' does not change the category of its base but adds certain meanings similar to *better*. Its meanings, however, can be fully characterized by a set of syntactic features, including [MANNER, EVAL, COMPARE, POSITIVE]. Accordingly, following Emonds' (2005) analysis, we can classify *out-* as a functional prefix stored in the Syntacticon that alternatively realizes the syntactic features by PF Insertion. This analysis of the functional prefix '*out-*' can be summarized as follows:

(89) a. *out-* 'surpass'

b. It alternatively realizes the feature complex [MANNER, EVAL, COMPAR, POSITIVE], which occurs in post-verbal position.

c. It is stored in the Syntacticon and undergoes PF Insertion.

The Resolving Analysis of prefixation, which has been proposed and whose applicability to prepositional prefixes has been examined in this chapter, has an important consequence for the division of labor in morphology. If prefixation is either compounding or AR, it does not play any role in derivational morphology. This means that prefixation lacks the category-changing function that is considered a primary role of derivation. Some prefixes are apparently responsible for the category determination observed in *be-fool* and *anti-war movement*, but careful observation indicates that there is no positive evidence for the category-changing functions of prefixes. Therefore, we can attribute these functions only to derivational morphology.

Chapter 4

Semi-lexical Categories and Headedness in Compounds

4.1. Introduction[1]

This chapter explores the consequences of the assumption that grammatical nouns have the same status as functional categories in that both of them are in the Syntacticon. The assumption leads to the prediction that in word-formation, grammatical nouns behave in the same way as nominal suffixes rather than regular lexical nouns. Based on Toman's (1986) and Boase-Beier's (1987) observations, this chapter demonstrates that this prediction is empirically supported.

A striking difference between regular lexical nouns and nominal suffixes is that when used as a head of a complex word, a nominal suffix allows the non-head to take complements, but a lexical noun does not (see Randall (1982, 1988), Roeper (1987), among others). The contrast can be observed in the following examples:

(1) a. a taxer of hidden assets

b. * a taxman of hidden assets

(Roeper (1987: 267), with a slight modification)

In these examples, the nominal suffix *-er* and the noun *man* are combined with the verb *tax*. In (1a), *-er* does not prevent the non-head from taking its argument *hidden assets*. This characteristic of nominal suffixes is also well known in the studies of complex event nominals (Grimshaw (1990)). Recall from Section 2.5.3 that in Emonds' (2000) analysis, a base verb functions as a head and can take its argument when a nominal suffix attached to the verb is

[1] This chapter is a revised and extended version of Naya (2016a, 2017a).

inserted by Syntactic Insertion. Since the nominal suffix *-er* is considered a member of the Syntacticon and can undergo Syntactic Insertion, it is natural that complex words with *-er* like *taxer* can co-occur with the arguments of the non-heads.

In contrast to *taxer*, *taxman* in (1b) does not co-occur with *hidden assets*, which means that the noun *man* blocks *tax* from taking its argument. Under Emonds' (2000) analysis, this is because *man* undergoes Deep Insertion and thus functions as the head from the beginning of the derivation; throughout the derivation, the complex word is a noun, which is generally not an argument-taking element.

The contrast between nominal suffixes and nouns can also be observed in the following examples:

(2) a. protection of children

b. * protection plan of children

(Roeper (1987: 282))

As with *-er*, the suffix *-tion* in (2a) allows the verb *protect* in the non-head *protect* to take its argument *children*. However, when the noun *plan* intervenes between *protection* and *children*, the argument cannot occur, as indicated in (2b).

If grammatical nouns have the same status as functional categories, they behave like *-er* in (1a) and *-tion* in (2a), rather than *man* in (1b) and *plan* in (2b). More specifically, the grammatical nouns in the head position of a complex word will allow the non-head to take arguments because they are Syntacticon items and can undergo Syntactic Insertion. Importantly, Toman (1986) and Boase-Beier (1987) point out that certain compounds can co-occur with the arguments of the non-heads. Let us observe the German and English compounds in (3).

(3) a. [German]

der *Beschleunigungsgrad* *der* *Partikeln*

acceleration-degree of particles (Toman (1986: 213)

b. [English]

Spring is the healing-time of all ills. (Boase-Beier (1987: 67))

In (3a), the compound *Beschleunigungsgrad* 'acceleration-degree' co-occurs with the noun *Partikeln* 'particles,' which corresponds to the argument of the verb *beschleunigen*, the non-head of the compound. Likewise, the compound *healing-time* in (3b) co-occurs with *all ills*, which can be interpreted as the argument of the verb *heal*. In these compounds, the nouns *degree* and *time* are in the head position but they allow the left-hand constituents *beschleunigen* and *heal* to introduce their arguments. Toman (1986) calls heads like those in the compounds in (3) "transparent heads," which can be defined as follows:

(4) Transparent Head

a head item that does not prevent arguments of an argument-taking item in the non-head position from being realized

(cf. Toman (1986: 212))

Toman (1986) and Boase-Beier (1987) do not associate transparent heads with grammatical nouns. However, Toman (1987) points out the parallelism between transparent nouns and nominal suffixes as follows:

(5) [T]rue, suffixes are generally transparent, but nouns, if sufficiently "abstract" (or, "empty"), can behave in the same way as transparent suffixes with respect to

> argument inheritance. The relevant property is thus not "to be a suffix" but "to be semantically light," whatever this may mean in formal terms.
>
> (Toman (1986: 214))

Note that the characteristics pointed out in (5) are similar to those of grammatical nouns; Emonds (1985: 162) describes grammatical nouns as the "least semantically specific members of N." In this chapter, I demonstrate that the nouns that can be transparent heads are limited to grammatical nouns, which reside in the Syntacticon, and explain why transparent heads allow non-heads to take their arguments. In addition, by showing the parallelism between grammatical nouns and nominal suffixes, I argue that grammatical nouns actually have the same status as functional categories.

This chapter is organized as follows. Section 4.2 observes compounds with transparent heads in German and English. Section 4.3 proposes that the nouns that can be transparent heads are grammatical nouns and accounts for why they allow the non-heads to take complements. Section 4.4 provides evidence for the proposed analysis. Section 4.5 discusses consequences of the proposal, which suggest that transparency can be regarded as a diagnostic of membership in the Syntacticon. Adopting this diagnostic, Section 4.6 examines apparent left-headedness in V-V compounds in Japanese, where non-heads take arguments. Section 4.7 makes some remarks on the lexical properties that Toman (1986) attributes to transparent heads. Section 4.8 summarizes this chapter. This chapter also contains an appendix, which considers apparent left-headedness observed in Japanese N-N compounds.

4.2. Compounds with Transparent Heads in German and English

4.2.1. Transparent Heads in German Compounds

Toman (1986) first observes the transparency of heads in German compounds. Let us examine the following examples:

(6) a. *der Beschleunigungsgrad der Partikeln*
acceleration-degree of particles (= (3a))

b. *die Vorbereitungszeit auf den Flug*
preparation-time on the flight
'preparation-period for the flight'

c. *die Wachstumsgeschwindigkeit der Pflanzen*
growth-speed of plants
'growth-rate of plants'

(Toman (1986: 213), with modifications)

In the example in (6a), which is repeated from (3a), the compound occurs with the argument that is generally selected by the non-head *beschleunigen* 'accelerate.' The same relationship between the non-head and the nominal elements can be observed in the examples in (6b, c). In (6b), the German noun *Zeit* 'time' does not block the occurrence of the argument of the verb *vorbereiten* 'prepare' in the non-head, and the noun *Flug* 'flight' occurs with the compound. Similarly, the head of the compound in (6c) *Geschwindigkeit* 'speed' allows the non-head *wachsen* 'grow' to take its argument *Pflanzen* 'plants.' Thus, in addition to *Grad* 'degree,' the nouns *Zeit* 'time' and *Geschwindigkeit* 'speed'are transparent heads.

As briefly mentioned in Section 4.1, not all nouns can be transparent. Toman (1986: 213) observes that the nouns that can be transparent have the characteristics in (7).

(7) on the whole, we are dealing with nouns which denote concepts that are very general and unspecific in nature, not with names of particular objects or concrete subspecies of general concepts (Toman (1986: 213))

We can observe this characteristic clearly in the examples in (8), where the head nouns in (6b, c) are replaced by words that have more specific meanings, namely *hall* and *study*.

(8) a. * *die* *Vordereitungshalle* *auf* *den* *Flug*
the preparation-hall for the flight (cf. (6b))
b. * *die* *Wachstumsstudie* *der* *Pflanzeng*
growth-study of plants (cf. (6c))
(Toman (1986: 213))

In contrast to the compounds in (6), the compounds headed by *Halle* 'hall' and *Studie* 'study' in (8) do not license the arguments of the non-heads. That is, *Halle* 'hall' and *Studie* 'study' cannot be transparent. This fact indicates that the nouns without the properties stated in (7) do not allow non-heads to take arguments.

4.2.2. Transparent Heads in English Compounds

Toman (1986) points out that in addition to German compounds, English compounds can contain transparent heads. Toman (1986) gives the following examples:

(9) a. a combination process of quicksilver and gold
b. * a combination procedure of quicksilver and gold
(Toman (1986: 213))

In (9a), the noun *process* is a transparent head because it does not block the verbal element *combine* from taking its argument, *quicksilver and gold*. However, if *process* is replaced with *procedure*, as in (9b), the argument cannot occur. Toman (1986) attributes the ungrammaticality in (9b) to the head noun *procedure*, which has rather concrete meanings. This is in line with what Toman (1986) observes in German compounds, which is summarized in (7).

Following Toman (1986), Boase-Beier (1987) gives additional examples of compounds with transparent heads. In addition to the compound *healing-time* in (3b), which is repeated as (10a), Boase-Beier (1987) points out that *waiting-period* (10b) and *amalgamating-process* in (10c) are also headed by transparent heads.

(10) a. Spring is the healing-time of all ills. (= (3b))

b. The waiting-period for news of the trapped miners was very trying for all concerned.

c. There were various questions about the amalgamating-process of mercury with gold.

(Boase-Beier (1987: 67-68))

For example, the noun *period* in (10b) behaves as a transparent head in that it allows the non-head *wait* to take the argument *news of the trapped miners*.

In line with Toman (1986), Boase-Beier (1987: 68) also notes the characteristics of transparent heads in English as in (11).

(11) Transparent heads are lexical elements of a very general, abstract semantic nature — like *time, period* and *process* — which apparently do not block θ-assignment

and which, typologically speaking, could be suffixes in other languages.

(Boase-Beier (1987: 68))

The non-heads in fact lose their argument-taking capacity when the head nouns in the compounds in (10) are replaced with other nouns like *plant*, *room*, and *dish* as in (12).

(12) a. * The dandelion is a healing-plant of many ills.

b. * There was a special waiting room for news of the miners.

c. * There were questions about the amalgamating dish of mercury with gold.

(Boase-Beier (1987: 68))

The examples in (12) show that the transparency of the nouns observed in *time*, *period*, and *process* is not a prototypical property of nouns in general. Rather, this property can be easily found in suffixes; Toman (1986) groups transparent nouns together with nominal suffixes, as stated in Section 4.1. Based on the parallelism between suffixes and transparent nouns, in the next section I will propose that transparent nouns have the same categorial status as suffixes.

4.3. Proposal

In the previous section, we observed compounds with transparent heads. Importantly, Toman (1986) and Boase-Beier (1987) point out that transparent nouns are similar to nominal suffixes in terms of the capability of being transparent and thus they can be grouped together. If so, it is desirable to treat transparent nouns in the same way as transparent nominal suffixes in order to account for the transparency of heads. In this section, I propose that they can be analyzed in such a desirable way within Emonds' (2000) framework introduced in Chapter 2.

Section 4.3.1 first recapitulates the assumptions in Emonds' (2000) framework relevant to head transparency in compounds and shows his analysis of "transparent" nominal suffixes.

4.3.1. Multi-level Lexical Insertion and Headedness

Let us first recapitulate the assumption about headedness in Emonds' (2000) framework. He carefully defines what counts as the head of a given structure. This is because the hypothesis of Multi-level Lexical Insertion allows the structural head to remain empty during syntactic derivation. To illustrate the point, let us suppose that the structural head is inserted by Syntactic Insertion or PF Insertion. In this case, the head is empty in the syntactic derivation before the relevant insertion. Emonds (2000) assumes that the empty structural head is "entirely inert prior to the derivational moment which associates it with a lexical item." In such a situation, the element functioning as the head is not the empty structural head but the highest lexically filled head in the relevant projection. In other words, the structural head can be different from the head during the syntactic derivation. Emonds (2000) calls the highest lexically filled head the "lexical head," whose definition is given in (13).

(13) Lexical Head/Projection

Let Y^0 be the highest lexically filled head in Z^j. Then Y^0 is the lexical head of Z^j, and Z^j is a lexical projection of Y^0. (Emonds (2000: 128))

Within this model, Emonds (2000: Section 4.7.2) accounts for the properties of complex event nominals like *examination* in (14). A striking characteristic of complex event nominals is that they inherit argument-taking properties from base verbs. Emonds (2000) attributes this characteristic to the late insertion of nominal suffixes. For example,

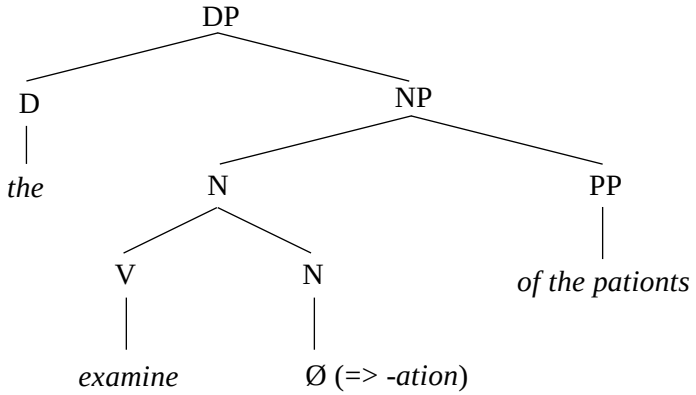
the verb *examine* in (14) takes its argument *the patients* across the nominal suffix *-ation*.

(14) The examination of the patients took a long time.

(Grimshaw (1990: 49), with modifications)

Emonds (2000) argues that the suffix *-ation* undergoes Syntactic Insertion. This means that the structural head of NP remains empty until the insertion, as represented in (15). As a result, the empty structural head is inert and the verb *examine* serves as a lexical head in the structure. Therefore, the verb can take the argument.

(15) Complex event nominals; *-ing*, *-ment*, etc. replace Ø during the syntax:



(cf. Emonds (2000: 153))

In the next subsection, I will extend this analysis to compounds with transparent heads.

4.3.2. Syntactic Insertion of Transparent Heads

Let us now consider the argument-taking property of compounds with transparent heads. The relevant examples are repeated in (16) for convenience.

(16) a. Spring is the healing-time of all ills. (= (4b))

b. The waiting-period for news of the trapped miners was very trying for all concerned. (= (10b))

c. There were various questions about the amalgamating-process of mercury with gold. (= (10c))

Given Emonds' (2000) analysis of the argument-taking property of complex event nominals, we can easily account for why *healing-time* can take the argument by assuming that *time* is inserted at the stage of Syntactic Insertion. A potential problem is concerned with the grammatical status of *time* because only functional categories can undergo Syntactic Insertion. However, this is not problematic. Recall that in Emonds' (2000) model, nouns can have the same grammatical status as functional categories, and such nouns are called "semi-lexical nouns." That is, *time* in this compound is a semi-lexical noun.

This is not strange, given the similarity between transparent heads and semi-lexical nouns. Their characteristics are given in (17) and (18) for comparison.

(17) Transparent Heads

a. on the whole, we are dealing with nouns which denote concepts that are very general and unspecific in nature, not with names of particular objects or concrete subspecies of general concepts (= (7))

b. Transparent heads are lexical elements of a very general, abstract semantic nature. (= (11))

(18) Semi-lexical Nouns

Semi-lexical N is comprised of the most frequently used and least semantically specific members of N. (Emonds (1985: 162))

As shown in (17), transparent heads denote concepts that are very general and unspecific in nature, and they are lexical elements of a very general, abstract semantic nature. Similarly, semi-lexical nouns are the least semantically specific members of N.

Importantly, Emonds (2000: 9) identifies *time* as a semi-lexical noun as in (19).[2]

(19) Semi-lexical N:

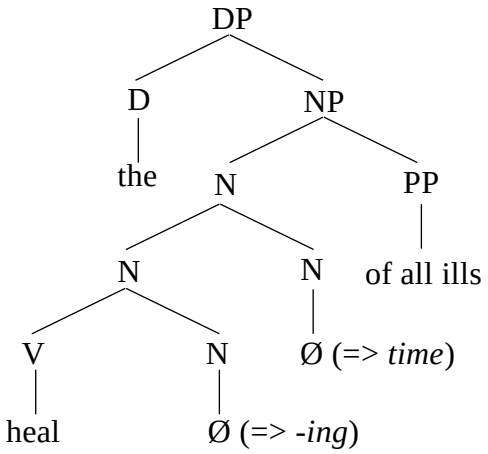
one, self, thing, stuff, people, other(s), place, time, way, reason, etc.

Based on this parallelism, I propose that the nouns that can be transparent are semi-lexical nouns. Since they are Syntacticon items, they can undergo Syntactic Insertion, allowing non-heads to take arguments.

This proposal can be illustrated as in (20). The structure in (20) contains two elements that are inserted at the level of Syntactic Insertion, that is, *-ing* and *time*. Although they are structural heads, they remain empty before the insertion. As a result, the verb *heal* functions as a lexical head and thus takes the argument, ignoring the two empty heads. In this way, we can clarify the nature of transparent heads and account for why they are ignored with respect to argument-taking.

[2] See also Kishimoto (2000) for the semi-lexicality of *time*.

(20) the healing-time of all ills (cf. (16))



If the proposed analysis is correct, *period* and *process* should also be semi-lexical nouns. These nouns are not identified as semi-lexical nouns in Emonds (2000). In addition, the proposed analysis predicts that other semi-lexical nouns can be transparent. The next subsection will show that these two predictions are correct.

4.4. Evidence

4.4.1. The Semi-lexicality of *period* and *process*

This subsection shows that *period* and *prices* are grammatical nouns. First, let us consider the semi-lexical properties of *period*. Importantly, *period* is related to the notion of time. Based on this relation, I assume that abstract elements like *TIME* can have several overt forms, and suggest the possibility that *period* is one of the overt forms of *TIME*. The assumption and possibility are not so strange given the case of the semi-lexical adjectives in (21).

(21) She seemed {real / pretty / awful / damned} {upset / happy}.

(Emonds (2001: 36))

In (21), all of the adjectives (i.e., *real*, *pretty*, *awful*, and *damned*) lack their original meanings, just expressing an extreme degree by modifying the adjectives *upset* and *happy*. In this sense, the adjectives are grammatical items. This example shows that the features related to "extreme degree" can be expressed in several ways. The one-to-many relationship observed between a set of features and its several phonological forms is a typical characteristic of functional categories (cf. comparative features and their two realization forms *more* and *-er*). Thus, *period* can be considered to express some features related to time, as well as *time*.

Next, let us examine whether *process* has any properties of semi-lexical nouns. According to Cover (2008), certain semi-lexical nouns can be silent. Thus, the semi-lexicality of *process* can be confirmed by examining whether it is capable of being silent or not.

One of environments where silent semi-lexical nouns are assumed to be used is verb-to-noun conversion. Shimada (2013) argues that silent semi-lexical nouns play an important role in verb-to-noun conversion in Japanese. For example, *hasir-i* in (22a), which is a noun converted from the verb *hasir-u* 'run,' has a silent semi-lexical noun *KATA* 'way' as a head, as shown in (22b).

(22) a. *hasir-i*
running-Inf
'the way of running'

b. *hasir-i KATA*
running-Inf-WAY
'the way of running'

(Shimada (2013: 84-85), with modifications)

Based on Shimada's analysis, Chapter 5 will argue that converted nouns in English have the same structure. That is, they are headed by silent semi-lexical nouns.

If the noun *process* is semi-lexical, it can be silent and combined with verbs to form converted nouns, in which case, we can predict there to be converted nouns with the meaning of *process*. Such converted nouns can be easily found in English and Japanese, as shown in (23).[3]

(23) a. attack, attempt, fall, hit, laugh, promise, search (Namiki (1985: 64))

b. *oyogi* 'swimming,' *sirabe* 'investigation,' *kasidasi* 'lending out'

(Martin (1988: 886))

For example, *attack* means the action or process of attacking. Martin (1988) refers to the converted nouns in (23b) as nouns naming the process itself. Thus, the converted nouns in (23) indicate that *process* can be silent. Accordingly, we can count it as a semi-lexical noun.

4.4.2. Semi-lexical Categories and Transparency

Given the proposal that the nouns that can be transparent are semi-lexical nouns, it is reasonable to predict that semi-lexical nouns other than the nouns analyzed in Boase-Beier (1987) can be transparent. Let us take the noun *place* as an example. Its semi-lexicality is certified by many studies such as Kishimoto (2000) and Collins (2007) as well as Emonds (2000). This prediction is borne out by the examples in (24).

[3] We can also observe converted nouns with the meanings of time or period in Japanese:

(i) a. *kure* dusking 'dusk'
b. *ake* dawning 'dawn'

These examples show the grammatical nature of *time* and *period*.

(24) a. This entire dwelling place is known as Hades, but the bottom section, knowns as Tartarus, is the waiting place for judgment.
(Charles Walter Doughty, *The Revelation Rainbow*, p.215; underlining mine)

b. That's where most counselors live out their professional lives—in a waiting place for another chance, another place in which their work can be valued again, an escape from a failed workplace not of their own making. (William L. Fibkins, *Wake Up Counselors!: Restoring Counseling Services for Troubled Teens*, p.38; underlining mine)

In these examples, *place* functions as a transparent head. In the expression *the waiting place for judgment* in (24a), *wait* takes the complement *judgment* across the noun *place*. The same is true of the example in (24b). In this example, *wait* takes the argument *another chance*. That is, the head noun *place* is ignored with respect to argument-taking. These examples show that the semi-lexical noun *place* can be transparent. This supports the proposal that the nouns that can be transparent are semi-lexical nouns.

One might take a dubious view of the proposed analysis because of the existence of the examples in (1), which are repeated as (25).

(25) a. a taxer of hidden assets

b. * a taxman of hidden assets

(= (1))

The noun *man* in (25b) may be counted as a semi-lexical noun because it also has "a very

general, abstract semantic nature," in that it can be used to refer to a human being or a person. This semantic nature leads us to predict that *man* is a semi-lexical noun and can be transparent in compounds.[4] However, this prediction is not correct; unlike the example with *-er* in (25a), the example in (25b) is ungrammatical in spite of the semantic similarity. This example does not seem to be compatible with the proposal.

I argue that the example in (25b) does not run counter to the proposal, because the ungrammaticality observed in the example in (25b) can be attributed to a principle working independently of that of semi-lexicality assumed in Emonds (2000). This principle is related to the economy of derivation operating at PF, at Emonds (2000) defines it as follows:

(26) Economy of Derivation at PF

arrive at PF by inserting the fewest possible maximal PF units, or "*insert as few words as possible*"

(Emonds (2000: 350), see also Emonds (2000: 135))

He notes that the italicized part in (26) is equivalent to the following:

(27) Insert as few free morphemes as possible in the course of a derivation.

(Emonds (2000: 350, fn. 26))

[4] The semi-lexicality of the word *man* can be supported by a restriction on it. Emonds (2000: 108) points out that a free Syntacticon item cannot be combined with another one as follows:

(i) *time-place, *self-people, * stuff-thing, *reason-self

This restriction on free Syntacticon items is in parallel with that on other functional items (e.g. **in-ic*, **de-ous* (Scalise (1984: 75)). According to Emonds (2000: 108), *man* also cannot be combined with other free Syntacticon items:

(ii) *way-man

Given the ungrammaticality in (ii), it seems plausible to count *man* as a semi-lexical noun.

That is, of the equivalent deep structures, the derivation with the fewest insertions of free morphemes is preferred (Emonds (2000: 135)).[5] The comparison of (25a) and (25b) shows that the former contains fewer free morphemes; *man* in (25b) has a semi-lexical status but it is still a free morpheme. Accordingly, the example in (25a) is preferable in light of the economy of derivation, and as a result the example in (25b) is ruled out. Importantly, the ungrammaticality of (25b) comes not from the lack of semi-lexicality of *man* but from economy in derivation. Therefore, the example in (25b) is not problematic to the proposed analysis.

Interestingly, English is equipped with suffixes for expressing persons (i.e., *-er*), but it does not have means to express the notions of time and place in the form of suffixes (Bauer (2013)).[6] It is plausible to assume that the lack of such suffixes leads to the use of the grammatical nouns *time* and *place*. This suggests that nominal suffixes and the grammatical nouns like *time* and *place* are in a complementary relationship, constituting a full-fledged set of functional items in English.

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[5] We can observe the effects of this principle in the following examples:

(i) a. * Ann did burn(ed) the papers.
b. * Jim seems more tall(er) than he was.
(Emonds (2000: 136), with modifications)

In (ia), the overt realization of *did* is blocked. This is because the features related to I (e.g., [PAST]) are realized by the bound form *-ed*, which suffices to express the features. As a result, the I head is zeroed, minimizing the occurrence of free forms. This realization pattern satisfies the principle of economy of derivation in (27). The same is true of the example in (ib). The comparative features are phonologically realized by *-er*, which is a sufficient and economical way to indicate the comparative meanings.

[6] I would like to thank Akiko Nagano (personal communication) for drawing my attention to this point.

4.5. Consequence: Transparency and the Membership of the Syntacticon

So far, we have proposed that the nouns that can be transparent are grammatical nouns. Although we need to carefully examine whether all of the semi-lexical nouns can be transparent, it is safe to say the following:

(28) If an element in the head position of a given complex word is transparent, it is a member of the Syntacticon.

This means that the capability of being transparent is a sufficient condition for being semi-lexical items. If so, (28) can be seen as a diagnosis for the membership of the Syntacticon. Note that (28) does not mention specific categories. Thus, it is predicted that in addition to nouns, other categories like verbs can be transparent, and thus the transparency helps us identify grammatical items. In this light, the next section examines apparent left-headedness in Japanese V-V compounds.

4.6. Apparent Left-Headedness in Japanese V-V Compounds

Corresponding to the Right-Hand Head Rule, the argument structure of a V-V compound in Japanese is generally determined by the verb in the right-hand position. The general pattern of argument realization in V-V compounds can be exemplified by *arai-nagasu* [wash-let.flow] 'wash away' in (29).

(29) *Watasi wa kuruma no* ***yogore*** *o* [*arai-**nagasi**-ta*].
I Top car Gen dirt Acc wash-let.flow-Past
'I washed away the dirt on the car.'

(Namiki and Kageyama (2016: 221))

The object of the whole compound verb in this example is the noun *yogore* 'dirt,' which is followed by the accusative case marker *-o*. This noun is related to *nagasu* 'let flow,' the right-hand constituent in the compound.

In contrast to this general pattern, some V-V compounds show (apparent) left-headedness with respect to the selection of arguments. Namiki and Kageyama (2016) give the following examples:

(30) a. *Watasitati wa onazi* ***densya ni***/**o* [*nori-awase-ta*].
we Top same train Dat/*Acc get.on-happen-Past
'We happened to get on the same train.'

b. *Kanozyo wa* ***koibito o*** [*mati-kuras-ita*].
she Top boyfriend Acc await-live-Past
'She waited for her boyfriend for a whole day/many days.'

c. *Titioya wa* ***musuko o*** [*sikari-tuke-ta*].
father Top son Acc scold-do.violently-Past
'Father scolded his son thoroughly.'

(Namiki and Kageyama (2016: 221), see also Yumoto (2005: 138, 139))

Namiki and Kageyama (2016: 222) note that in (30a), the dative marker attached to the noun *densya* 'train' "originates from the V1 [the verb in the left-hand] *nori-* 'get on' of the compound verb *nori-awaseru* 'happen to ride,' whereas the V2 [the verb in the right-hand] *awaseru* lit. 'put together' has lost its original meaning in this compound and means that the multiple actions denoted by the verb in V1 took place coincidentally." The same can be observed in the examples in (30b, c); the accusative objects are selected by the verbs in the

non-head position.

The verbs in the head position in the compounds in (30) can thus be regarded as transparent. In light of (28), this further indicates that they are semi-lexical verbs. Their semi-lexical nature is also indicated by their semantic properties. The verbs in the head position in (30) lack their original meanings. To be precise, the head verb *awaseru* in (30a) literally means 'put together' but here adds the meaning of coincidence of the action, as stated above. Likewise, Namiki and Kageyama (2016: 222) point out that *kurasu* in (30b) literally means 'live, pass a day' but it "means here only that the waiting activity continued for a long sketch of time;" and *tukeru* in (30c) originally means 'add' but here it emphasizes "the severity of the scolding action." Namiki and Kageyama (2016: 222) summarize the characteristics of the V-V compounds in (30) as follows (see also Kageyama (2013)):

(31) … the verbs in the right-hand position of the [(30)-type] V-V compounds are devoid of argument structures and case and instead supply the verbs on the left with a variety of aspectual meaning. In such "aspectual compounds," the subcategorization features of a whole compound verbs are regulated by the verbs in the non-head position.

Kageyama (2016: 297) lists representative examples of "aspectual compounds" as in (32) and shows that their characteristic meanings "are classified into temporal, spatial, and social aspect" (see also Kageyama (2013: 17, 18)).[7]

[7] Kageyama (2016) calls the verbs with aspectual meanings "L(exical)-aspectual verbs." These verbs fall under the class of semi-lexical verbs.

(32) **I. Temporal**

a.	completive	*kaki-ageru* (vt.) 'write up,' *kesi-saru* (vt.) 'wipe out'
b.	incompletive	*ii-sasu* (vt.) 'stop speaking halfway'
c.	intensive result	*ne-komu* (vi.) 'fall sound asleep,'
		komari-hateru (vi.) 'be completely at a loss'
d.	inception	*saki-someru* (vi) 'begin to bloom'
e.	continuative	*huri-sikiru* (vi) 'rain on and on,' *naki-kurasu* (vi.) 'cry all day'
f.	iterative	*hozikuri-kaesu* (vt.) 'dig again,'
		tukai-komu (vt.) 'use repeatedly'
g.	intensive action	*sawagi-tateru* (vi.) 'fuss about,'
		izikuri-mawasu (vt.) 'fumble about'
h.	ineffective	*nobi-nayamu* (vi.) 'do not make expected progress'
i.	reciprocal	*i-awaseru* (vi.) 'happen to be at the same place'

II. Spatial aspect *donari-tukeru* (vi.) 'yell at,'

hare-wataru (vt.) 'be clear all over the sky'

III. Social (interpersonal) aspect

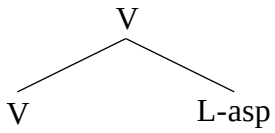
moosi-ageru (vt.) 'say to respectable person,'

mi-kudasu (vt.) 'look down upon'

(partially adopted from Kageyama (2016: 297) with modifications)

Kageyama (2013, 2016) calls the (30)- and (32)-type V-V compounds "lexical aspectual compound verbs" and assumes them to have the structure in (33).

(33)



(L-asp = Lexical-aspect; Kageyama (2013: 26))

Under the framework of this study, I argue that the semi-lexical verbs related to aspectual meanings are inserted in the L-asp position at the level of the Syntactic Insertion.

This provides a coherent analysis of the elements adding lexical aspectual meanings in Japanese and English. Note that in the list in (32), some Japanese lexical aspectual compound verbs are translated as verb-particle combinations in English. The relevant examples are repeated in (34).

(34)

		Jpanese	English
a.	completive	*kaki-ageru*	write up
		kesi-saru	wipe out
b.	continuative	*huri-sikiru*	rain on and on
c.	intensive action	*sawagi-tateru*	fuss about

As indicated in these examples, English post-verbal particles can add aspectual meanings. Typical examples are shown in (35).

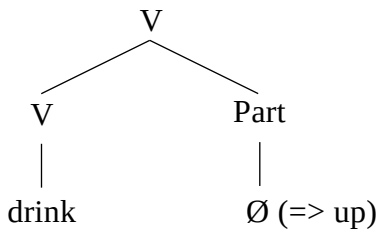
(35) a. John drank up the beer. (McIntyre (2004: 546))

b. Greg cleaned up the car. (Dehé (2002: 6))

In these examples, the particle *up* has the meaning of completion. In Naya (2015), I analyze

verb-particle combinations as exemplified in (34) and (35) and argues that the particles with aspectual meanings are semi-lexical prepositions that undergo Syntactic Insertion. The derivation of *drink up*, for example, is represented as follows:

(36) *drink up*



(Naya (2015: 94), with slight modifications)

Comparison of (36) with (33) shows that aspectual verb-particle combinations in English are similar to lexical aspectual compound verbs in Japanese in that semi-lexical elements provide aspectual meanings of the verbs with which they are combined. In this way, the proposed analysis treats Japanese and English complex words where the right-hand constituents supply the left-hand constituents with aspectual meanings in the same way.

Looking at the list in (32), one might think that there are too many semi-lexical verbs in Japanese, because preferably the number of semi-lexical categories should be small, as (genuine) functional categories are. However, this is not so strange, given that Japanese is a morphology-preferring language (see Nishimaki (2015); cf. Ackema and Neeleman (2004)). Morphology-preferring languages are known for the richness of their expressions involving verbal complexes. Japanese has a variety of verbal complexes, including V-N compounds (e.g. *sen-sya(-suru)* 'to wash cars'), N-V compounds (e.g., *ude-gumi(-suru)* 'to fold one's arms'), and V-V compounds (e.g., *tabe-hajimeru* 'to begin to eat') (Nishimaki (2015: Section 2.3.2), see also Ackema and Neeleman (2004: 85-88)). Thus, it is reasonable to assume that

morphology-preferring languages like Japanese have many morphological ways to realize lexical aspects in the form of compounding.

This section provided additional examples of semi-lexical categories based on the fact of transparency: semi-lexical verbs in Japanese add aspectual meanings to the verbs in non-head position. These verbs can be assumed to be stored in the Syntacticon and undergo Syntactic Insertion.

4.7. Some Remarks on the Lexical Properties Derived from Transparent Heads

Finally, I remark on Toman's (1986) characterization of transparent heads. According to Toman (1986), transparency of the head in complex words involves not only argument inheritance but also the entire range of lexical properties. As an example, Toman (1986: 214) observes that an N-N compound with a transparent head can be modified by "an adjective in such a manner that the adjective relates to the noun in the non-head position of the compound, i.e., not to the head of its projection." To understand this point, let us first illustrate a general pattern of the modification of compounds. Generally, adjectives cannot modify the element in non-head position, as shown in (37).

(37) * *dreiköpfiger Familienvater* [German]
three-headed family-father
intended reading: 'a father of a three-head family'

(Toman (1986: 214))

In this example, *dreiköpfiger* 'three-headed' relates to the noun in the non-head position *Familie* 'family,' but it cannot modify the constituents inside the compound. This property is known as the Lexical Integrity Principle. Toman (1986) points out that contrary to the

general pattern, the adjectives in (38) and (39) can modify the non-heads of compounds.

(38) *psychologische beratungsstelle* [German]
psychological counselling-board
'board for psychological counselling'
(Bergmann (1980), cited from Toman (1986: 214))

(39) *deutsche Literaturwissenschaft* [German]
German literature-science
intended reading: 'the study of German literature'
(Toman (1986: 214))

In (38), *psychologische* 'psychological' is intended to modify *Beratung* 'counselling,' not the head noun *Stelle* 'location.' As a whole, the expression means 'board for psychological counselling.' Although it modifies a component inside the compound, this example is acceptable. Toman (1986) argues that this type of modification is possible when a compound has a transparent head.

If this is true, we can predict that the same phenomenon should be observed in English compounds, and indeed we can find similar examples, as shown in (40) and (41).

(40) A rapid chemical <u>combination process</u> of fuel with air that releases the chemical energy of the fuel.
(*Encyclopedia of Dairy Sciences*, s.v. Combustion)

(41) The basic chemical <u>combination process</u> of fuel oil is similar to that of pulverized coal[.]
(Anthony J. Pansini, *Guide to Electric Power Generation [Second edition]*, p.33)

As noted in the previous sections, the underlined part *combination process* is a compound with a transparent head. In both examples, the compound follows the adjective *chemical*. This adjective can be interpreted as a modifier of *combination*, which is in the non-head position. These examples seem to suggest that English transparent heads, or semi-lexical nouns, have the same property as German ones in terms of the modification of non-heads.

However, things are more complicated. In the analysis of German compounds, Toman (1986) seems to assume the structure in (42a), where the adjective is outside the compound. This structure is available in English as well, but there is another possible structure, as indicated in (42b). Here, the adjective is in the non-head position of the compound together with a noun.

(42) a. A [N N]$_N$

b. [[A N] N]$_N$

If the expression *chemical combination process* has the structure in (42b), the adjective is inside the compound, and thus it is not strange that it modifies the noun in the non-head position.

Importantly, compounds with this structure can be easily found in English, as shown in (43).

(43) a. [fresh fish] market, [fresh water] supply, [hot night] wind, [small car] accidents

b. [early morning] sun, [late night] meeting

(partially adopted from Shimamura (2014: 35))

According to Shimamura (2014), these compounds contain an A+N expression in non-head position. Shimamura (2014) also notes that A+N can freely occur in the non-head position as long as it has a type-specifying function. For example, in [*fresh fish*] *market* in (43a), the A+N expression *fresh fish* specifies the type of *market*.

Since the compounds with the structure in (42b) are not rare, we need to first examine whether the adjective *chemical* in (40) and (41) is outside or inside the compound. This means that the modification of the non-head by an adjective cannot be straightforwardly attributed to a transparent head in English. I leave the question of this structure for future research.

In closing, I would like to touch on some other properties that may come from transparent heads or semi-lexical elements. Recall that there are some similarities between complex event nominals and compounds with transparent heads. These similarities leads us to predict that both of them behave alike in many other respects. Let us show two prospective parallel properties. Firstly, complex event nominals can be modified by adjectives like *frequent* and *constant*, as in (44).

(44) a. The frequent **expression** of one's feelings is desirable.

b. The constant **assignment** of unsolvable problems is to be avoided.

(Grimshaw (1990: 50), with slight modifications)

Thus, we can predict that a compound with a transparent head can also be modified by these adjectives. The second property is related to the examples in (45). As in (45a), the noun *process* does not itself license aspectual modifiers like *in five hours* and *for five hours*. In contrast, complex event nominals can co-occur with such modifiers, as shown in (45b, c).

(45) a. * the **process** { in five hours / for five hours }

b. The total **destruction** of the city in only two days appalled everyone.

c. Only **observation** of the patient for several weeks can determine the most likely …

(Grimshaw (1990: 58-59), with slight modifications)

Given this contrast, a compound with a transparent head like *combination process* can co-occur with such aspectual modifiers. I would like to examine whether these predictions are correct in future research.

4.8. Summary

This chapter has shown that grammatical nouns have the same grammatical status as nominal suffixes based on Toman's (1986) and Boase-Beier's (1987) observations on compounds with transparent heads. Given their characterization of transparent heads, we can argue that such heads are grammatical nouns. Since both of them are the members of the Syntacticon, they can undergo Syntactic Insertion. When they undergo Syntactic Insertion, they are inert before insertion. As a result, transparent heads allow non-heads to take their arguments. This derivational process is exactly the same as that of nominal suffixes like *-tion* in *protection of children*. The semi-lexical items found in the discussion and their properties can be summarized as follows:

(46) a. time, process, period

b. They function as the head of a complex word whose non-head selects arguments.

c. They are stored in the Syntacticon and undergo Syntactic Insertion.

Given the proposed analysis, we can obtain the following prospective diagnostic of Syntacticon items:

(47) If an element in the head position of a given complex word is transparent, it is a member of the Syntacticon.

I showed that this diagnostic works well by pointing out that this corresponds to what Namiki and Kageyama (2016) observe in Japanese lexical aspectual compound verbs. The studies of this type of compounds, along with the diagnosis in (47), help us detect additional grammatical verbs in the Bifurcated Lexical Model. The examples of Japanese lexical aspectual compound verbs and their properties are shown in (48).

(48) a. *-ageru, -sasu, -komu, -sikiru* (see (32) for other examples)

b. They function as the head of V-V complex verbs, adding lexical aspectual meanings to the non-head verbs.

c. They are stored in the Syntacticon and undergo Syntactic Insertion.

Appendix to Chapter 4

Apparent Left-Headedness in Japanese N-N Compounds

Section 4.6 mainly dealt with apparent left-headedness in Japanese V-V compounds. As we observed, they are different from other V-V compounds in that the head is transparent with respect to argument selection. This appendix shows another type of apparent left-headedness in Japanese N-N compounds and examines whether or not their "abnormality" arises for the same reason as do the compounds with transparent heads examined in Chapter 4.

The N-N compounds in Japanese on which we focus in this appendix are shown in (49).

(49) a. *maturi-Tsukuba*
festival-Tsukuba
[the name of a festival held in Tsukuba-city]

b. *hoteru-Kansai*
hotel-Kansai
[the name of a hotel in the Kansai area of Japan]

c. *takkyuubin-konpakuto*
delivery-compact
[the name of a delivery service of small-sized parcels]

(Ikarashi and Naya (2016), see also Naya, Ikarashi, and Nishimaki (2015))

Ikarashi and Naya (2016) point out that these attested examples seem to be left-headed compounds in terms of semantics in that they function as names for what are expressed by left-hand constituents. For example, *maturi-Tsukuba* 'festival-Tsukuba' in (49a) is not a

kind of Tsukuba but a festival. Likewise, *hoteru-Kansai* 'hotel-Kansai' in (49b) is the name of a hotel and *takkyuubin-konpakuto* 'delivery-compact' in (49c) is the name of a delivery service. In this way, the compounds in (49) seem to be semantically incompatible with the Right-Hand Head Rule.

Similar examples can be easily found, especially in trade names. The examples in (50) are the names of *taiyaki*, Japanese fish-shaped cakes.[8]

(50) a. *kurowassan-taiyaki* *syokora*
croissant-taiyaki chocolate
[the name of chocolate-taste *taiyaki* with the croissant-like texture]

b. *kurowassan-taiyaki* *kasutaado*
coissant-taiyaki custard
[the name of *taiyaki* with the croissant-like texture filled with custard]

Note that the examples in (50a, b) do not express a kind of *syokora* 'chocolate' or *kasutaado* 'custard' but rather a kind of *taiyaki*, even though this is in the left-hand constituent. In this sense, the right-hand constituents *syokora* and *kasutaado* are ignored.

This observation might lead us to judge the right-hand nouns in (49) and (50) to be transparent heads in terms of semantics. If so, the nouns would be counted as semi-lexical nouns. However, this approach to the compounds in (49) and (50) is not promising. Unlike the case of the compounds examined in Chapter 4, the nouns in the head position of the compounds in (49) maintain their original meanings; *Tsukuba* in (49a), for example, means Tsukuba City, expressing the venue of the festival. Thus, I reject the idea that the (overt) right-hand constituents in the compounds in (49) are transparent, that is, semi-lexical

[8] The (49)- and (50)-type compounds function as proper names, rather than as common nouns.

nouns. Rather, following Shimada's (2017) analysis, I argue that another type of semi-lexical elements is involved in the compounds.

Shimada (2017) proposes that the (49)-type compounds are headed by silent semi-lexical categories, as shown in (51), where the semi-lexical element is represented by *Ø*.

(51) *maturi-TsukubaØ* (Shimada (2017: 50-51), with modification)

The semi-lexical element assumed in the (49)-type compounds is a relational noun that can form nominal predicates by combining with nouns. The resulting predicates denote classificatory properties (Nagano and Shimada (2015)). According to Shimada's (2017) intuition, *TsukubaØ* in (51), for example, expresses the style or type of the festival named by the compound at issue. That is, the compound *maturi-Tsukuba* has the following meaning:

(52) *maturi* *no* *Tuskuba-fuu*
festival Gen Tsukuba-type
'Tsukuba-type festival'
(Shimada (2017: 51), with modification)

Note that (52) contains *-fuu* '-type,' a semi-lexical relational noun (Nagano and Shimada (2015)). This supports the existence of the semi-lexical element *Ø* in (51). Shimada (2017) argues that the compound in (51) is derived from a phrase consisting of the subject *maturi* 'festival' and the predicate *Tsukuba-Ø*. Compounds derived from phrases are argued for by Shibatani and Kageyama (1988) and Kageyama and Shibatani (1989), where such compounds are called "post-syntactic compounds." The (49)-type compounds in fact share properties with post-syntactic compounds. For example, Shibatani and Kageyama (1988:

459) point out that post-syntactic compounds are pronounced "with a light pause put after the first member." Along with post-syntactic compounds, *maturi-Tsukuba* can involve a slight pause immediately after *Tsukuba*. This phonological property supports the analysis where the (49)-type compounds are derived from phrases involving semi-lexical nouns.

Given Shimada's (2017) analysis, since the compounds in (49) are headed by silent semi-lexical elements, we can say that they do not violate the Right-Hand Head Rule without assuming *Tsukuba* in (49a), for example, as a semi-lexical noun.

The semi-lexical nouns that can be used in the (49)-type compounds are not limited to *-fuu* 'type' in (52) (and its silent counterpart in (51)). Shimada (2017) provides additional examples of such semi-lexical relational nouns as in (53).

(53) a. *-see* '-made.by, -made.in,' *-gata*/*kata* '-shape, -size'

b. *-taipu* '-type,' *-sutairu* '-style'

The nouns in (53a) are Sino-Japanese words and those in (53b) are foreign words (especially originating in European languages). Nagano and Shimada (2015: 128) also provide the list in (54), which semantically classifies semi-lexical relational nouns.

(54) a. **Material**: *see* 'made by,' *iri* 'added'

b. **Origin**: *see* 'made in,' *kee* 'descended from,' *syussin* 'coming from,' *umare* 'born in'

c. **Shape/Size**: *kee* 'shape,' *kata/gata* 'shape, size'

d. **Taste**: *azi*/ *mi* 'taste,' *huumi* 'taste'

e. **Type**: *see* 'type, nature,' *gata* 'type,' *kee* 'type'

f. **State**: *zyoo* 'state,' *zyootai* 'state,' *sugata* 'wearing'

g. **Belonging**: *kumi* 'group,' *ha* 'group, school,' *syugi* 'ism,' *syozoku* 'belonging to'

h. **Similarity**: *huu* 'like,' *ryuu* 'like, in the style of'

i. **Possession/Ingredient**: *tuki* 'with,' *moti* 'with,' *iri* 'added'

j. **Purpose/Target**: *yoo* 'for,' *muke* 'meant for,' *sen'yoo* 'exclusively for'

k. **Location**: *mae* / *zen* 'front,' *sita / ka* 'under,' *naka* 'in, inside,' *ue / zyoo* 'on, above,' *tyuu* 'inside,' *kan* 'between,' *iki* 'bound for,' *hatu* 'departing from,' *muki* 'toward, faced to,' *kake* 'hanged on'

l. **Time**: *mae* 'before,' *go* 'after,' *tyuu* 'during'

m. **Status/Profession**: *zin* 'nationality,' *si* 'specialist,' *hu* 'female,' *kan* 'official,' *ko* 'worker,' *zyo* 'female,' *toshite* 'as'

n. **Level**: *kyuu* 'level,' *reberu* 'level,' *do* 'degree,' *i* 'level'

(Nagano and Shimada (2015: 128), with slight modifications)

Given the variety of semi-lexical relational nouns, we can assume that the compounds in (49) and (50) also involve semi-lexical relational nouns. For example, *konpakuto* 'compact' in *takkyuubin-konapkuto* 'delivery-compact' specifies the type or size of parcels that the delivery service handles; *syokora* and *kasutaado* in the compounds in (50) specify the tastes of *taiyaki*. Accordingly, we can assume that the compounds involve the silent counterparts of *-taipu* '-type' or *-saizu* '-size' and *-azi* '-taste' as follows:[9]

[9] As with the case of the compounds in (56), I assume a silent semi-lexical element in *hoteru-kansai* as follows:

(i) *hoteru*-[*kansai-Ø*]

This silent element means abstract location. Although this element does not seem to have an overt counterpart, this is not problematic. See Section 6.5.2 for this issue.

(55) a. *takkyuubin*-[*konpakuto*-{ TAIPU / SAIZU }]

delivery-[compact-{ TYPE / SIZE }] (cf. (49c)

b. *kurowassan*-[*taiyaki* { *syokora* / kasutaado }-AZI]

croissant-[taiyaki { chocolate / custard }-TASTE] (cf. (50))

These examples also support Shimada's (2017) analysis. Thus, we can eliminate apparent left-headedness without recourse to the implausible assumption that the overt right-hand nouns (e.g. *konpakuto* 'compact', *syokora* 'chocolate,' *kasutaado* 'custard') are semi-lexical items.

To conclude, this appendix has considered the N-N compounds in (49) and (50), which apparently violate the Right-Hand Head Rule in terms of semantics. Extending the proposed analysis to the apparent left-headed compounds we examined in Chapter 4, one may consider the heads of the compounds in (49) and (50) also to be semantically transparent heads, in other words, semi-lexical nouns. In this appendix, however, I reject this approach. Rather, following Shimada's (2017) analysis, I argue that the compounds involve silent semi-lexical relational nouns as their heads. As a result, the compounds in (49) and (50) are no longer examples of deviations from the Right-Hand Head Rule. This analysis provides additional examples of semi-lexical items for the Bifurcated Lexical Model. That is, we can regard the semi-lexical nouns in (53) and (54) as members of the Syntacticon. They are employed to yield complex relational nominals.[10] The semi-lexical items identified in this appendix and their roles and grammatical status can be summarized as follows:

(56) a. *-see* '-made.by, -made.in,' *-gata*/*kata* '-shape, -size,' *-taipu* '-type,' -

[10] I will argue that silent semi-lexical items require a different treatment from overt ones in Chapter 5.

sutairu '-style,' etc. (see (54) for other examples)

b. They are combined with nouns, forming complex relational nouns with some classificatory functions.

c. They are stored in the Syntacticon and undergo Syntactic Insertion.

Chapter 5

Deverbal Noun-Forming Processes in English:

The One-Step Nominalization Approach to Deverbal Nouns

5.1. Introduction[1]

In the previous two chapters, we mainly examined grammatical nouns, verbs, and prepositions, which are semi-lexical categories in Emonds' (2000) sense. We explored their functions in word-formation, supporting the hypotheses of the Bifurcated Lexical Model. These items are assumed to be listed in the Syntacticon with secondary membership in the component; they are not canonical items of the Syntacticon, in that they are borrowed from the Dictionary to implement certain grammatical functions. In Section 2.7, we refined the notion of semi-lexicality by focusing on this secondary membership. If the Syntacticon contains secondary members, it is natural to suppose that *the Dictionary* also involves lexical items with secondary membership, in that they originated in the Syntacticon. Unlike semi-lexical items in the Syntacticon, those in the Dictionary are employed to express certain lexical meanings. If such items are actually in the Dictionary, semi-lexical categories are symmetrically distributed between the Dictionary and the Syntacticon. This can be formalized as a hypothesis of the symmetric existence of semi-lexical categories:

(1) Symmetric Existence of Semi-lexical Categories

a. The Syntacticon contains N, V, A, and P that are devoid of purely semantic features *f*.

b. The Dictionary contains lexical items that originate in the Syntacicon and are assigned purely semantic features *f*.

[1] This chapter is an extended and revised version of Naya (2016b).

This view of semi-lexicality and semi-lexical categories departs from Emonds' (2000) original one, though it depends on his framework in assuming the two lexical subcomponents.

Hoping to elaborate the Bifurcated Lexical Model, Chapters 5 and 6 explore semi-lexical items in the Dictionary. In this chapter, we will introduce heavy suffixes and zero-nominal elements in the Dictionary that come from the Syntacticon. This chapter demonstrates that these semi-lexical items play an important role in deverbal noun-forming processes in English. Given such items, we can account for certain facts concerning several types of deverbal nominals that have been observed in the literature.

As already mentioned in several parts of this thesis, it has been observed in the literature that deverbal nominals can be classified into two types. They are complex event nominals (CENs) and result nominals (RNs) in Grimshaw's (1990) terminology. The former are represented in (1) and the latter in (2).

(1) a. The examination of the patients took a long time.

b. The constant assignment of unsolvable problems is to be avoided.

(2) a. The examination was on the table.

b. The assignment is to be avoided.

(Grimshaw (1990: 49, 50))

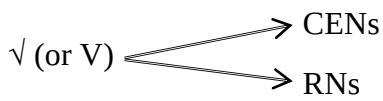
The two types of nominalizations differ in the inheritance of properties of their verbal bases. Only CENs inherit properties of verbal bases, so that they behave like the base verbs to a certain extent. For example, the CEN *examination* in (1a) has an event reading and licenses an argument structure like the transitive verb *examine*, but the RN *examination* in (2a) has a referential reading like a noun and lacks an argument structure. The primary concern of the previous studies on nominalization has been to identify and explain their differences in

behavior.

According to Shimamura (2009), there are two approaches to explaining the relationship between CENs and RNs. In the first approach, CENs and RNs are independently derived from a basic element such as a verb or a category-neutral root (√) (Grimshaw (1990), Ito and Sugioka (2002) and Borer (2003)). For example, adopting a syntactic approach to word-formation, Borer (2003) assumes that RNs are formed via attaching a nominalizer directly to a root, while CENs are derived by nominalizing certain verbal functional projections. In this approach, though the two types of nominals have different structures, their derivations start from the same root. In the second approach, deverbal nominals are derived as CENs first, and then RNs are derived via certain processes (Grimshaw (2004), Alexiadou and Grimshaw (2008), Harley (2009), and Shimamura (2009, 2011)). Alexiadou and Grimshaw (2008) call this approach the two-step nominalization approach. Adopting their terminology, let us call the former approach the one-step nominalization approach.

The relationship between CENs and RNs in the one-step nominalization approach and in the two-step nominalization approach can be represented as in (3) and (4), respectively.

(3) One-Step Nominalization Approach



(4) Two-Step Nominalization Approach

√ (or V) => CENs => RNs

These two approaches make different predictions. More precisely, unlike the one-step nominalization approach, the two-step nominalization approach makes the following two

predictions:

(5) a. If a deverbal noun can serve as both a CEN and an RN, it should start out with an event reading and later acquire a result reading.

b. Although deverbal nouns that serve only as CENs exist, those that serve only as RNs do not.

In other words, since RNs are assumed to be derived from CENs under the two-step nominalization approach, deverbal nominals should be used as CENs before being used as RNs, as stated in (5a), and RNs never emerge independently of CENs, as stated in (5b). The one-step nominalization approach, on the other hand, does not assume that RNs are derived from CENs. That is, the two types of nominals can exist independently. Therefore, the approach does not make the predictions in (5).

In this chapter, I will first show that CENs and RNs are independently derived based on data from the *Oxford English Dictionary* (2nd edition, on CD-ROM; *OED* henceforth), arguing for the one-step nominalization approach. Second, I will argue that the nature of CENs and RNs and the relationship between them are nicely captured by the hypothesis of symmetric existence of semi-lexical catgories. More precisely, the Dictionary can turn items from the Syntacticon into lexical categories by assigning purely semantic features *f* and contain silent lexical elements; such items exist as secondary members of the Dictionary.

This chapter is organized as follows. Section 5.2 introduces some distinctions between CENs and RNs observed in the literature. These distinctions function as criteria to classify relevant nouns into CENs or RNs. Section 5.3 examines the predictions in (5) empirically by conducting a diachronic survey of the meanings of deverbal nominals with the suffix *-ment* and by observing the behaviors of converted nouns, which are another type

of deverbal noun. It will be found that the relevant data indicate that the predictions of the two-step nominalization approach are incorrect. To capture the relationship between CENs and RNs, Section 5.4 will introduce Emonds' (2000) original analysis of CENs and RNs. The section also shows that the analysis favors the one-step nominalization approach but still needs a modification to capture certain facts concerning converted RNs. To do this, Section 5.5 will clarify the morphological status of CENs and RNs and elaborate how they are formed. More precisely, while Emonds analyzes both CENs and RNs as derivatives, this section will pursue the possibility of analyzing CENs as derivatives and RNs as compounds. Moreover, Section 5.6 will show that converted nouns, uniquely RN nominalizations, can also be treated in a similar manner by hypothesizing silent nominals in the Dictionary. Section 5.7 will examine the implications of the proposed analysis of RNs for competition in word-formation. Section 5.8 will extend the proposed analysis of converted nouns in Japanese to converted verbal nouns and adjectival nouns. Section 5.9 will summarize this chapter. The section is followed by an appendix containing lists of the converted nouns and *-ment* nouns relevant to the discussion.

5.2. Some Distinctions between Complex Event Nominals and Result Nominals

First, let us introduce some differences between CENs and RNs, which are used as diagnostics in this chapter. We have already observed two differences between CENs and RNs: (i) only CENs have argument structures and (ii) only CENs require event readings. In the rest of this section, let us observe their other differences.

Firstly, only CENs can be modified by temporal modifiers such as *constant* and *frequent*, as shown in (6) and (7).

(6) a. The constant assignment of unsolvable problems is to be avoided.(= (1b))

b. * The constant assignment is to be avoided.

(7) a. The frequent expression of one's feelings is desirable.

b. * The frequent expression is desirable.

(Grimshaw (1990: 50))

Secondly, the possessive NP cannot be interpreted as the subject of the nominal in the case of RNs. Let us observe the sentences in (8).

(8) a. (*) The instructor's examination took a long time.

b. The instructor's examination of the papers took a long time.

(Grimshaw (1990: 51))

If *instructor* is interpreted as the subject or the agent of *examination*, it forces the nominal *examination* to be a CEN and an internal argument is obligatorily required. Therefore, (8a) is excluded if *the instructor's* is interpreted as a subject, and (8b) is acceptable with a CEN reading. (8a) is only acceptable with *the instructor's* interpreted as a modifier, inducing an RN reading.

The third difference is that agent-oriented adjectives such as *intentional* and *deliberate* cannot co-occur with RNs, as in (9a), but are compatible with CENs, as in (9b).

(9) a. * The instructor's {intentional / deliberate} examination took a long time.

b. The instructor's {intentional / deliberate} examination of the papers took a long time.

(Grimshaw (1990: 51, 52))

The fourth difference is that CENs cannot be pluralized, while RNs can, as the contrast between (10a) and (10b) shows.

(10) a. * The assignments of the problems took a long time.

b. The assignments were long.

(Grimshaw (1990: 54))

Finally, CENs and RNs differ in the selection of determiners. Let us observe the sentences in (11).

(11) a. They observed {the / *an / *one / *that} assignment of the problem.

b. Assignment of difficult problems always causes problems.

c. They studied {the / an / one / that} assignment.

(Grimshaw (1990: 54))

The sentences in (11a, c) show that though the definite determiner *the* is compatible with both of CENs and RNs, the indefinite determiner, numerals like *one*, and demonstratives like *that* can co-occur only with RNs. (11b) indicates that CENs can be used without any determiners. In this sense, CENs behave like uncountable nouns.

Importantly, Grimshaw (1990: 58) points out that "[t]here are many nominals that seem to denote events but do not behave like the complex event nominal." For example, the noun *examination* in (12) denotes the event of examining like a CEN. Simultaneously, it can occur without arguments like an RN.

(12) The examination took a long time. (Grimshaw (1990: 51))

Grimshaw (1990) calls this type of nominal a simple event nominal (SEN), grouping it together with RNs. The event denoted by SENs is a kind of entity. In what follows, I employ the term "RN(s)" as a cover term for RNs and SENs.

The differences between RNs and CENs mentioned above are summarized in (13), which is partially adopted from Borer (2013: 52-53). Based on these differences, I will classify the data from the *OED* in Section 5.3.

(13) Some differences between RNs and CENs

	RNs	CENs
a.	no obligatory arguments	obligatory arguments
b.	no necessary event reading	event reading
c.	modifiers like *frequent*, *constant* only with plural[2]	modifiers like *frequent*, *constant* may occur without plural
d.	possessives are modifier	possessives are arguments
e.	no agent-oriented modifiers	agent-oriented modifiers
f.	may be plural	must be singular
g.	indefinite articles, numerals, demonstrative	zero article, definite article

5.3. Empirical Arguments against the Two-Step Nominalization Approach

In spite of the behavioral differences between CENs and RNs, the two-step

[2] Grimshaw (1990) considers nouns like *event*, *race*, *trip*, and *exam* to be SENs because they denote events, as shown in (i).

(i) The {event / race / trip / exam} took a long time.

Since these nouns denote events, they are compatible with the modifier *frequent* as long as they are pluralized, as shown in (ii).

(ii) a. * The frequent {trip / event} was a nuisance.
b. The frequent {trips / events} were a nuisance.

(Grimshaw (1990: 59))

In this chapter, SENs are regarded as RNs. Therefore, based on the sentences in (ii) we can say that modifiers like *frequent* occur only with plural forms of RNs, as the table in (13) summarizes.

nominalization approach implies that they are related to each other. In this section, I provide counterarguments to the two-step nominalization approach, based on the data on deverbal nominalization involving the derivational suffix *-ment* and conversion. Specifically, I show that the two predictions made by the two-step nominalization approach noted in Section 5.1 fail. Sections 5.3.1 and 5.3.2 are concerned with the first and second prediction, respectively.

5.3.1. The Emergence of Complex Event Nominals and Result Nominals in the History of English

The first prediction of the two-step nominalization approach in (5a) is represented here as (14).

(14) If a deverbal noun can serve as both a CEN and an RN, it should start out with an event reading and later acquire a result reading. (= (5a))

(14) implies that if a given deverbal nominal is or was used both as a CEN and as an RN in the history of English, its CEN use emerged earlier than its RN use.

In order to examine whether this prediction is correct or not, I focus on the deverbal nominalization with the suffix *-ment*, using data from 1450 to 1600. The reason lies in the productivity and exclusive function of *-ment* as a derivational suffix in this period. According to Marchand (1969: 331) and Lindsay and Aronoff (2013), it is safe to say that *-ment* was a productive nominal suffix in English from 1450 to 1600 (see also Anshen and Aronoff (1999)). More importantly, its new use in derivation leads us to eliminate or reduce unwanted noise from the data. Thus, I will focus on the *-ment* nouns and attested data from the *OED*.

Using the *OED*'s Advanced Search function, I retrieved the *-ment* nouns that (i) are recorded over the period 1450-1600, (ii) have verbal bases, and (iii) are not marked as obsolete. In total, I collected 165 *-ment* nouns, and 106 examples of them have both event readings and result readings. The two-step nominalization approach predicts that the 106 examples were all first used as CENs, following by RN usages. However, the prediction is clearly not born out. Let us see the data in detail.[3]

First, observe the 28 nouns in (15). The numbers in the table are the years each word was first used as a CEN or RN.[4]

(15)

	CEN	RN		CEN	RN
abolishment	1542	1812	diminishment	1546	1561
abridgment	1494	1523	distinguishment	1586	1611
achievement	1475	1548	ejectment	1567	1602
accouplement	1483	1576	enablement	1495	1503
affamishment	1590	1615	endowment	c1460	1494
annulment	1491	1664	enforcement	1475	1547
assiegement	1587	1839	enfranchisement	1595	1601
assuagement	1561	1599	engrossment	1526	1597
assythment	1535	1753	enjoyment	1553	1665
avengement	1494	1535	entreatment	1557	1560
changement	1584	1677	obtainment	1571	1802
contentment	1474	1579	prolongment	1593	a1814
controlment	1494	1525	revengement	1494	1540
defrayment	1547	1579	relinquishment	1594	1613

[3] It should be noted here that a diachronic survey based on dictionaries inevitably has limitations. For example, dictionaries do not list all existing words. In addition, although some dictionaries, including the *OED*, show the dates of the first citations of words, it is not clear whether the date indicates when the word was first coined or when it was established in a community. Recognizing these limitations, I assume that "the word-list of some large reference work (or set of reference works) is equivalent to the set of existing words" (Bauer (2001: 35)), and I regard the date of first citation in the *OED* as "an approximate indicator of when a word came into use" (Aronoff and Lindsay (2014: 76)).

[4] The letters "a" and "c" before a date stand for "ante" and "circa," respectively.

These derived nominals first appeared as CENs and were later used as RNs. For example, consider the case of *abolishment*:

(16) a. 1542 Remember that he offered himself … for the abolishment of all your sins. (Becon, Thomas *Potation for Lent Works*, underlining mine)

b. 1812 By abolishing that system in the countries which he has subjected, and by necessitating its abolishment in others.

(Southey, Robert *The Quarterly Review VIII*, underlining mine)

The deverbal noun *abolishment* was first recorded in 1542, as shown in (16a). It is attested as a CEN. Firstly, *abolishment* co-occurs with the DP *all your sins*, which can be an argument of the verb *abolish* (cf. *to abolish all your sins*) (cf. (13a)). Secondly, the relevant phrase *the abolishment of all your sins* has the event reading, that is, "abolishing all your sins." According to the definition in the *OED*, the noun means "the process of abolishing, putting an end to, or doing away with" (cf. (13b)). As shown in Section 2, these characteristics are typical of CENs. On the other hand, the noun in (16b), which is found in 1812, shows the formal and semantic characteristics of an RN. Firstly, though the derived nominal *abolishment* in (16b) names the process of abolishing, it occurs without arguments (cf. (13a)). Secondly, the noun in (16b) co-occurs with *its* but it cannot be interpreted as an agent (cf. (13d)). These facts indicate that the noun in (16b) is an RN. The deverbal nominal *abolishment* was first used as a CEN, and it subsequently came into use as an RN.

The order of emergence of the CEN use and RN use of the deverbal nouns in (15) is what the two-step nominalization predicts. However, in the other 77 examples, RN use is attested earlier than CEN use, as shown in the table in (17).[5] That is, they denote the results

[5] The tables in (15) and (17) do not contain the deverbal noun *enablement*, whose CEN use

of the events expressed by the verbs, the events themselves, or even a certain participant in the events (such as an instrument).

(17)

	RN	CEN		RN	CEN
abasement	1561	1857	entrapment	1597	1875
abatement	1513	1528	establishment	1481	1706
accomplishment	c1460	1561	exilement	1548	1738
acknowledgement	1594	1611	extinguishment	1503	1535
admeasurement	1598	1767	famishment	c1470	1667
adornment	1480	1641	furnishment	1558	1563
agistment	1527	1611	garnishment	1550	1581
allotment	1574	1751	government	1483	1587
allurement	1548	1601	incitement	1594	1647
arraignment	1548	1635	inducement	1594	1648
arrestment	1474	1645	infringement	1593	1878
assessment	c1540	1548	improvement	1453	1478
astonishment	1576	1616	instalment	1589	1594
banishment	1507	1607	investment	1597	1615
betrayment	1548	1863	lodgement	1598	1713
blemishment	1596	1884	management	1598	1657
cherishment	1526	1823	obligement	1584	1641
debasement	1593	1835	pesterment	1593	1652
defacement	1561	1622	preferment	1451	1454
deforcement	1581	1884	pronouncement	1593	1680
denouncement	1544	1641	publishment	1494	1887
department	c1450	a1677	ravishment	c1477	1529
disablement	1485	1503	rebatement	1542	1598
discernment	1586	1729	rebutment	1593	1824
disgorgement	c1477	1837	reconcilement	1549	?1567
disbursement	1596	1849	re-establishment	1586	1651
divorcement	1526	1593	renouncement	1494	1640
embarkment	1596	1813	releasement	1548	1568
embracement	1485	1611	renewment	1571	1637
employment	1593	1689	replenishment	1526	1802
empoisonment	1569	1600	representment	1594	1640
encampment	1598	1686	resignment	c1470	1606
encouragement	1568	1711	retirement	1596	1847
endamagement	1593	1863	retrenchment	c1600	1654

and RN use are both recorded in 1495.

endorsement	1547	1633	reversement	1575	1590
enhancement	1577	1710	seducement	1586	1602
enlargement	1540	1564	sustainment	c1450	1568
enrolment	1535	1640	treatment	c1560	1781
entertainment	1531	1603			

Thus, these are nouns that started out as RNs and were later used as CENs. A typical case is illustrated in (18).

(18) a. 1598 Admeasurement lies between commoners.

(Kitchin, John *Jurisdictions; or the Lawful Authoritie of Courts Leet, Courts Baron*, underlining mine)

b. 1767 When the terror is so great, no dependence can be placed upon the admeasurement of time in any person's mind.

(Hutchinson, Thomas *The History of the Province of Massachusetts Bay (1628-1750)*, underlining mine)

In the sentence in (18a), which is the first citation of the noun *admeasurement*, the noun occurs without the internal argument of the verb *admeasure*. This lack of the argument is a manifestation of the RN character of *admeasurement* in (18a) (cf. (13a)). After the result reading emerged, the event reading of *admeasurement* was attested in 1767, as the quotation in (18b) shows. *Admeasurement* co-occurs with the noun *time*, which is interpreted as the argument of the verb *admeasure* (cf. *to admeasure time*) (cf. (13a)). Its event reading is also confirmed by the definition in the *OED*, "the process of admeasuring; applying a measure in order to ascertain or compare dimensions" (cf. (13b)). The other nominals in (17) show the same pattern. RN use precedes CEN use. The facts in (17) are strong evidence against the two-step nominalization approach.

In sum, it is revealed that 28 deverbal nouns are first recorded as CENs, but in 77 deverbal nouns, RNs precede CENs. This indicates that CENs and RNs are independently derived, contrary to the prediction of the two-step nominalization approach in (14).

5.3.2. The Independent Existence of Result Nominals

Let us turn to the second prediction of the two-step nominalization approach given in (5b), which is repeated as (19).

(19) Although the deverbal nouns that serve only as CENs exist, those that serve only as RNs do not. (= (5b))

Certainly, there are deverbal nouns that only have CEN readings.[6] However, there are also deverbal nouns which only function as RNs, indicating that the two-step nominalization approach is not tenable. These deverbal nouns can be collected diachronically and synchronically. Deverbal nouns with the suffix *-ment* again provide us with diachronic data. Synchronic argument is possible with conversion data. First, let us see the historical data on the suffix *-ment*.

In this case again, we focus on *-ment* from 1450-1600 for the reason already mentioned.

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[6] For example, nouns derived via the suffix *-ing* are mainly CENs, as evidenced by the following examples, in which the arguments (i.e., *the trees* and *the city*) are obligatory:

(i) a. The felling *(of the trees) cf. They felled *(trees).
b. The destroying *(of the city) cf. They destroyed *(the city).
(Grimshaw (1990: 50))

We can find that there are deverbal nouns with other nominal suffixes, such as those underlined in (ii), that function only as CENs:

(ii) arriv<u>al</u>, expan<u>sion</u>, interrog<u>ation</u>, maintenan<u>ce</u>, move<u>ment</u>, thef<u>t</u>
(Emonds (2005: 253), underlining mine)

These nouns are not problematic for the two-step nominalization approach.

According to the *OED*, the total number of deverbal nouns with *-ment* during this period is 165. The number of nouns having only result readings is 59. The 59 nouns are listed in (20).[7]

(20)

Noun	Date	Noun	Date	Noun	Date
accoutrement	1549	defilement	1571	libament	1582
advertisement	c1460	department	c1450	lurement	1592
allegement	1516	detainment	1586	mazement	c1580
allowment	1579	disagreement	1495	medicament	1541
amazement	1595	discontentment	1579	merriment	1576
annoyment	c1460	disguisement	1580	monishment	1483
approachment	1544	embattlement	1538	mumblement	1595
assailment	1592	embezzlement	1548	needment(s)	1590
assentment	1490	encroachment	1523	perishment	1548
attainment	1549	enfeoffment	1460	prattlement	1579
attirement	1566	enfoldment	1593	preferment	1451
attornment	1531	enragement	1596	rejoicement	1561
besiegement	1564	entrenchment	1590	requirement	1530
betterment	1598	gazement	1596	revealment	1584
bickerment	1586	impalement	1598	revilement	1590
blandishment	1591	infeftment	1456	revivement	1598
brabblement	1556	inurement	1586	scarcement	1501
convictment	1593	languishment	a1541	traducement	1597
comportment	1599	incensement	1599	wonderment	1535
consignment	1563	inditement	1567		

To confirm that these nouns are RNs, let us take the noun *wonderment* in (20) as an example. The *OED* lists the following definitions for *wonderment*:

[7] An anonymous reviewer of *English Linguistics* (*EL*) points out that *merriment* in the table in (20) is not a deverbal but deadjectival noun. It is true that the verb *merry* is obsolete, and *merriment* seems to be derived from the adjective *merry*. However, the entry for *merriment* in the *OED* shows that the noun is etymologically derived from a verb, as shown in (i).

(i) [f. merry v. + -ment.] (f. = from)

Based on this description, I include the noun *merriment* in the category of deverbal nouns.

(21) The definitions of *wonderment* in the *OED*

a. The or a state of wonder. (1535)

b. An expression of wonder. (1553)

c. An object of or a matter for wonder; wonderful thing. (1542)

d. A wonderful example or instance (of something). (1606)

e. Wonderful quality. (1596)

The noun was first used in 1535 to refer to "the or a state of wonder." Following this meaning, the other four meanings emerged. These definitions show that the noun does not express the complex event of wondering but names the states or things involved in the event of wondering. The existence of the nouns in (20) indicates that the usage of RNs does not depend on that of CENs.

The *OED* search thus reveals that there were some deverbal nouns only used as RNs in the history of English. Turning to our eyes to Present-day English, we can also find nominalization only deriving RNs. This is what is called conversion. Conversion provides further evidence against the two-step nominalization approach.

Conversion is a category change without any change in form.[8] The following are examples of the pairs of a verb and a converted noun:

(22) a. to attempt an attempt

b. to murder a murder

c. to process a process

d. to promise a promise

[8] Note that the term *conversion* is used here in a theoretically neutral sense.

It has been observed in the literature that conversion derives RNs only. We will summarize the observations of Grimshaw (1990), Borer (2013) and Shimamura (2009).

Grimshaw (1990: 67) classifies converted nouns as SEN, a kind of RN. Converted nouns show characteristics of RNs, that is, the omission of arguments, pluralization and co-occurrence with demonstratives. For concreteness, let us observe the examples in (23)

(23) a. their attempt to climb the mountain

b. John's attempt (to convince people that he has initiated an investigation) was unsuccessful.

cf. * John attempted.

(Grimshaw (1990: 74), with slight modifications)

The converted noun *attempt* apparently has an event reading. However, the infinitival clause selected by it can be omitted, as in (23b). This optionality suggests that the converted noun *attempt* belongs to an RN. Moreover, the demonstrative *this* and the possessive *their* can modify it, and the plural marker *-s* can attach to it, as shown in (24).

(24) a. This particular attempt to convince people that the procedure was fair was doomed to failure.

b. Their attempts to convince people that the procedure was fair were doomed to failure.

(Grimshaw (1990: 75))

These phenomena suggest again that the converted noun *attempt* is an RN. The apparent event reading in (23a) is the result of the naming function of RNs; that is, the converted noun

attempt names the events or the action of attempting.

Borer (2013) also points out that converted nouns cannot occur in the context of CENs (A(rgument)S(tructure)-nominals, in her terminology), presenting the examples in (25).

(25) a. * the walk of the dog for three hours
b. * the dance of the fairy for a whole evening
c. * the (gradual) fall of the trees {for two hours / in two minutes}
d. * the salute of the officers by the subordinates
e. * the import of goods from China in order to bypass ecological regulations

(Borer (2013: 332), underlining mine)

In (25), even though the converted nouns have meanings similar to the corresponding verbs, the nouns cannot take complements.

Shimamura (2009) provides further evidence that converted nouns are not CENs but RNs (see also Shimamura (2011)). She points out that many of converted nouns unambiguously refer to concrete objects. Examples of such nouns are listed in (26).

(26) award, cook, drink, crumble, guide, haunt, lounge, meet, open, refill, reject, sink, smear, wrap (Shimamura (2009: 111-112))

For instance, the nouns *drink* and *reject* mean a (alcoholic) liquid for drinking and someone or something that is rejected, respectively. Since these nouns lack event readings, they do not take arguments that the corresponding verbs require, as shown in (27).

(27) a. * John's reject of her offer

b. * their drink of much wine

(Shimamura (2009: 112))

These examples demonstrate that conversion exclusively forms RNs.

These observations pose a serious problem to the two-step nominalization approach, in which RNs are necessarily formed based on CENs; that is, the approach cannot account for why conversion can derive RNs without deriving CENs.

In sum, the empirical data in this section reveal that RNs are formed independently of CENs, contrary to the prediction of the two-step nominalization approach.

5.3.3. Summary and Problems

We have shown that the two-step nominalization approach cannot be maintained and the one-step nominalization approach is favorable. However, we still have a problem with conversion even within the one-step nominalization framework. The fact to be explained is that there is no instance of converted nouns behaving as CENs. If conversion is zero-suffixation as Marchand (1969) and Kiparsky (1982) assume, there should be a case in which the zero-suffix derives CENs as the overt suffix *-ment* does. We can stipulate that the zero-suffix derives only RNs. Such stipulation is possible but it is still unclear why the zero-suffix does not derive CENs. Thus, among the models arguing for the one-step nominalization approach, a model that can answer the following questions is more desirable: (i) How are CENs and RNs formed? (ii) Why is it that converted nouns cannot function as CENs? In what follows, we show that these questions can be resolved within the framework of Emonds (2000, 2005). Section 5.4 shows how it deals with nominalization. Section 5.5 makes a proposal to clarify morphological differences between CENs and RNs, thereby answering question (ii).

5.4. Nominalizations in the Bifurcated Lexical Model

Under the Bifurcated Lexical Model, the independent existence of CENs and RNs is a natural consequence of Multi-level Lexical Insertion of derivational morphemes. Since nominalizing suffixes are members of the Syntacticon, they can undergo two different types of insertion. The two different types of insertion yield two types of deverbal nominals; Emonds (2000: Section 4.7.2) claims that Deep Insertion of the suffix forms RNs, and Syntactic Insertion of them, CENs (see also Emonds (2005: Section 4.1)). Crucially, there is no dependency between Deep Insertion and Syntactic Insertion. It thus follows that RNs and CENs are independently formed.

For concreteness, let us consider the formation of the deverbal noun *assignment*. Under Emonds' analysis, *assignment* can have the following contrasting structures at the beginning of the derivations:

(28) a. RN: $[_N\ [_V$ assign$]\ [_N$ ment$]]$

b. CEN: $[_N\ [_V$ assign$]\ [_N\ \ ]]$

The structure in (28a) is that of *assignment* as an RN, showing that the suffix is inserted via Deep Insertion and it is attached to the verb at the beginning of the derivations. The structure in (28b) is that of *assignment* as a CEN. In this case, the nominal structure is formed at the beginning of the derivations, but the suffix is not inserted at this level, unlike the case of the formation of the RN. Leaving the site of the nominal suffix empty, the derivation proceeds, in which the verb serves as a head of the structure (cf. Emonds (2000: 128; 2005: 231)). At the end of the syntactic processing and prior to Spell-Out, the suffix *-ment* is inserted via Syntactic Insertion. Then, the suffix serves as the head of the noun. The two insertion options are freely available to the derivational suffix and, consequently,

the formation of RNs and that of CENs take place independently of each other.

Given Emonds' analysis, we can explain the diachronic facts revealed in this chapter. As long as nominal suffixes are listed in the Syntacticon, they have two options for insertion. Which option is chosen earlier varies from case to case.[9] Thus, it is natural that some deverbal nouns first came into use as RNs and others as CENs.

The difference in the insertion level accounts for why CENs, but not RNs, retain verb-like properties. As stated above, in the structure of the CEN in (28b), it is the verb *assign* that serves as the head until the insertion of the nominalizing suffix. As a consequence, the verb can select its complement until it is nominalized via the insertion of the suffix *-ment*, so that CENs inherit argument structures from verbs. On the other hand, since the suffix of RNs is inserted at the beginning of the derivation as represented in (28a), the verb cannot serve as the head throughout the derivation. Therefore, the verb does not select arguments, so that RNs lack argument structure.

In this section, I have shown how the Bifurcated Lexical Model accounts for the differences between the two types of nominals. Emonds (2000, 2005) argues that the Deep Insertion of a nominalizing suffix yields an RN while its Syntactic Insertion produces a CEN. However, Emonds (2000, 2005) does not refer to converted nouns and it is not explained why converted nouns are always RNs. If, following Marchand (1969) and Kiparsky (1982), we assume converted nouns are derived by a zero-suffix, we are compelled to stipulate that the zero-suffix undergoes only Deep Insertion even within the framework of Emonds (2000,

[9] An anonymous *EL* reviewer points out that the present analysis seems to predict that *assignment* as an RN and *assignment* as a CEN, for example, should have appeared at around the same time that the suffix *-ment* came to be a member of the Syntacticon. It is true that the two types of nominals become *possible words* at the same time. However, this does not mean that they necessarily occured as *actual words* simultaneously. Whether the possible words indeed occur and join the set of actual words depends on several factors. For example, a possible word may not occur for socio-cultural reasons or due to the existence of another form (Aronoff (1976)). Given that some of these factors have been considered extra-systemic (Bauer (2001: 42)), it seems impossible to predict whether and when a given possible word will become an actual word.

2005) as it stands. In what follows, I will show that the facts concerning converted nouns (and the relationship between CENs and RNs) can be explained without this stipulation. More precisely, assuming that CENs and RNs are different in morphological status of the head, I argue that whereas CENs are derivatives, RNs are compounds.

5.5. Overt Nominalization

5.5.1. Proposal: Result Nominals as Compound Nouns

In the analysis of nominalizations, Emonds (2000, 2005) just calls the two types of nominals "derived nominals" and seems to regard the suffix in CENs and RNs as the same element, a nominalizing suffix. However, he argues that suffixes of CENs and those of RNs differ from each other in the levels of insertion. Focusing on this difference, I make the proposal in (29).

(29) When Syntacticon items undergo Deep Insertion, they are assigned purely semantic features *f* in the Dictionary.

In other words, the assignment of *f* features turns the Syntacticon elements undergoing Deep Insertion into "lexical" elements. This is not so strange given that the Dictionary is a list for items with *f* features. Moreover, since there are "grammatical" classes N, V, A and P, which lack *f* features, it is also natural to assume what can be called "lexical" functional categories. Such categories constitute the secondary strata of lexical items in the Dictionary, so that they are also classified as "semi-lexical" categories. If so, there is a symmetric relation between the semi-lexical categories in the Syntacticon and those in the Dictionary:

(30) Symmetric Existence of Semi-lexical Categories

a. The Syntacticon contains N, V, A, and P that are devoid of purely semantic features *f*.

b. The Dictionary contains lexical items that originate in the Syntacticon and that are assigned purely semantic features *f*.

The semi-lexical categories in Emonds' (2000, 2005) sense are those in (30a). I propose here that their symmetric counterparts exist, as stated in (30b). Such items are given a secure place in Emonds' Bifurcated Lexical Model. The morpheme *-ment* deriving RNs is a semi-lexical category of the (30b) type. It is originally a suffix stored in the Syntacticon. It can be assigned a purely semantic feature *f* in the Dictionary and utilized as a head of RNs. The lexical entry of *-ment* is, thus, changed from (31a) into (31b) via Deep Insertion.

(31) a. *-ment*, N, +ABSTRACT, +<V__>

b. *-ment*, N, + ABSTRACT, +<V__>, *f*

If the suffixes in RNs undergo Deep Insertion and those in CENs Syntactic Insertion, the former have *f* features but the latter do not, as represented in (32a) and (32b).

(32) a. assign + -ment (RN)

<*f*> <*f*>

b. assign + -ment (CEN)

<*f*>

What is important here is that both of the constituents of the RN have *f* features and one of

them is a bound form (i.e. *-ment*). Recall that the process of combining items from the Dictionary (i.e. items with *f* features) is called compounding. Given this definition, RNs like *assignment* in (32a) are compounds. In this sense, RNs have the same morphological status as words like *nationhood*, whose head is a bound form but contains an *f* feature, as shown in (33).[10]

(33) nation + -hood

<*f*> <*f*>

On the other hand, since the heads of CENs lack such features, CENs are derivatives.

Under this view, the suffix deriving CENs and that forming RNs play different roles in the process of nominalization. In CENs, the role of the suffix is purely syntactic in that it just changes the category of the verbal base. In RNs, on the other hand, the suffix has a lexical nature just as the second constituent in compounds such as *blackboard* has. In other words, the suffix in RNs serves as the head of compound formations, as with *-holic*, *-hood*, *-philia*, etc. The category of RNs is determined in accordance with the Right-Hand Head Rule (Williams (1981)).

In this section, I have proposed that the elements that undergo Deep Insertion are assigned *f* features. This proposal makes a clear distinction between the suffixes in CENs and those in RNs; the former are derivational suffixes, but the latter are "lexical" bound morphemes with *f* features and function as heads of compound formations. Based on such

[10] The status of *nationhood* as a compound is, for example, supported by a diachronic fact. According to Kondo and Fujiwara (1993: 96, 100), the Old English suffix *-hād* '-hood,' which shifted from a free form to a bound form in the Old English period, means "state, rank, order, condition, character." The lexical item *-hood* is now a bound form, but it still means "condition or state" (*OED*). Based on this fact, it is not unnatural to regard *nationhood* as a compound and *-hood* as a Dictionary item. Emonds (2000: 97) points out that some of the elements traditionally classified as suffixes, including *-hood*, may be analyzed as "heads of compound formations."

differences and the definition of compounds given by Emonds (2000), I conclude that CENs are derivatives but RNs are compounds. If this conclusion is correct, it is predicted that RNs will show compound-like properties. Section 5.5.2 will show that this prediction is borne out in terms of interpretations.

5.5.2. Evidence: Parallel Behaviors between Result Nominals and Compound Nouns

As proposed in Section 5.5.1, the RN *assignment*, for example, consists of the verb *assign* and the suffix *-ment* with an *f* feature. Since the suffix, which has the syntactic feature N, serves as the head in *assignment*, the word can be regarded as a kind of V+N compound. Thus, we can expect that RNs have similar interpretations to V+N compounds. In this subsection, we observe that RNs and compound nouns show parallel behaviors and support the compound analysis of RNs proposed in Section 5.5.1.

Before examining interpretations of RNs, we need to clarify the meanings or lexical contents of the suffix *-ment*. Let us assume that items in the Dictionary originated in the Syntacticon are assigned less specific meanings than items originated in the Dictionary and that such "lexical functional categories" have very general or abstract meanings. More specifically, the suffix *-ment* acquires the meaning "thing," "substance" or "entity" in the Dictionary. With this in mind, let us first consider semantic properties of uncontroversial V+N compounds to compare them to those of RNs.

Lieber (2009: 359) refers to V+N compounds as an example of subordinate compounds, which are compounds "that express some sort of argumental relation between their constituents." For example, the second constituent can bear object-, subject-, or adjunct-oriented relations to the first, as observed in (34).[11]

[11] Although I refer to the compounds in (33) as examples of V+N compounds, there is a controversy about the category of the first constituent. According to Lieber (2009: 361), the first constituent of this type of compounds can be analyzed as a noun derived from a verb by conversion.

(34) a. object-oriented: kick-ball, call girl

b. subject-oriented: attack dog, jump jet, call bird

c. adjunct-oriented: skate park

(Lieber (2009: 361))

In the compound *kick-ball* in (34a), *ball* can be interpreted as the object of the verb *kick*, and so the compound refers to a ball that is kicked. In the compound *attack dog* in (34b), because *dog* can be interpreted as the subject of *attack*, the compound means a dog that attacks someone or something. The compound *skate park* in (34c) shows an adjunct relation between the constituents. The noun *park* in the head position expresses a place where an event of skating takes place.

The view of RNs as compounds predicts that these relations can be observed between the first constituent (i.e., the verb) and the second one (i.e., the suffix). Given that the suffix *-ment* bears the meaning "thing" or "entity," the object-oriented argumental relation can be found in the noun *assignment*. That is, *assignment* can be interpreted as "thing that is assigned." The same relation can be observed in the RNs in Section 5.3, some of which are listed in (35a). In addition, subject- and adjunct-oriented relations can be found in other nouns in Section 5.3, as exemplified in (35b) and (35c).

(35) a. object-oriented: allotment, consignment, endowment, needments, obtainment, publishment, requirement

b. subject-oriented: allurement, astonishment, blandishment, garnishment,

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Under this analysis, compounds like *kick-ball* are N+N compounds. Lieber (2009: 361) also points out that analyzing the first constituents of the compounds *scrub woman* and *tow truck* as converted nouns seems less plausible. Based on the existence of these compounds, I favor the view that the first constituents of this type of compounds are verbs.

incitement, management, merriment, revilement, seducement

c. adjunct-oriented: installment, lodgement, retirement

For example, *allotment* in (35a) can be interpreted as "thing that is allotted." In *blandishment* and *revilement* in (35b), "thing" expressed by the suffix serves as the subjects of the verbs *blandish* and *revile*, and thus, the deverbal nouns roughly mean "thing that blandishes someone" and "thing that reviles someone," respectively, where "thing" refers to words or speeches. In the case of the noun *lodgement* in (35c), the "entity" expressed by the suffix bears the adjunct-oriented relation to the verb *lodge*, meaning "entity at which persons or things are lodged," where the "entity" refers to a place or building. The same relation can be found in *installment* when it means "a place or seat wherein some one is installed" (*OED*), although the *OED* notes that the use of the noun with this meaning is obsolete and/or rare.[12]

In addition to the interpretations just described, where the RN refers to the entity, most RNs, including those in (35), can be interpreted as names of actions or results of events as well. The nouns with such interpretations are exemplified in (36).

[12] Note that I do not argue that *-ment* with purely semantic features *f* in the head position of an RN function is a real (internal/external) argument or adjunct. I just argue that we can observe object-, subject-, or adjunct-oriented relations between the head and the non-head, just as in uncontroversial compounds. One might think that the mechanism for interpreting the RNs is too loose and unregulated. However, such looseness or ambiguity can be found in compounds in general. Scalise and Guevara (2006: 188) state that "it is often the case that the same sequence of constituents can correspond to more than one interpretation." For example, they point out that the sequence dog bed can have the following interpretations: (i) "bed of/for a dog," (ii) "bed with a dog-like shape," and (iii) "bed and dog" (not possible in English). Likewise, a *-ment* noun can have more than one interpretation. For example, *retirement* can mean "place to which someone retires" and "action of retiring," and so the noun is listed in (34c) and (35a).

In addition, the ambiguity can be regarded as a reflection of the nature of semi-lexical categories. As I have argued, the meanings of semi-lexical categories are vague in that they are highly abstract and general. As a consequence, the compounds containing such categories also have vague meanings. In sum, the ambiguity in the interpretation of RNs can be attributed to the natures of compounds and semi-lexical categories. Therefore, the ambiguity is not problematic for the present analysis.

(36) a. action: acknowledgement, annulment, arraignment, assailment, banishment, endorsement, inditement, releasement, representment, retirement, retrenchment, treatment

b. result: abasement, amazement, assessment, betterment, blemishment, controlment, detainment, incensement, languishment, obligement, prolongment, rebatement

In these RNs, we cannot observe a clear argumental relation between their constituents, and so they cannot be interpreted in parallel with subordinate compounds. Then, how does the suffix in the RNs in (36) contribute to the interpretation of each compound as a whole, and what type of compounds are the compounds in (36)?

I argue that the RNs in (36) can be interpreted in a similar way to the compounds called attributive compounds. In attributive compounds, a nominal head is modified by a non-head. They typically consist of an adjective and a noun, as exemplified by *blue cheese*, where the adjective *blue* modifies the noun *cheese*. In the RNs in (36), the nominal head, which is assumed to have very abstract meanings such as "action" or "result," is modified or specified by the verbal element in the non-head position. The nominal heads in the RNs are uninterpretable unless they are modified, because they have highly abstract meanings.[13] For example, *treatment* in (36a) and *abasement* in (36b) can express "action of treating" and "result of abasing," respectively, because the verbal elements modify or specify the nominal

[13] In this sense, RNs are similar to "dummy compounds." According to Štekauer (2002: 106), the heads of dummy compounds stand for a very general class of "objects," whose nature is specified by the first constituents in the compounds (see also Hohenhaus (1998)). As an example of a dummy compound, Lieber (2009: 365) lists *Enron thing*, which means "the trials involving accounting fraud in the Enron Corporation" in a certain context. RNs and dummy compounds are similar in that a head needs to be modified or specified by a non-head. Thus, RNs may be classified as dummy compounds. However, as Lieber (2009: 365) notes, dummy compounds are not a distinct type of compound; rather, they can be regarded as a kind of attributive compound. Therefore, I characterize RNs as attributive compounds in this chapter.

heads.

In sum, RNs can be interpreted in a way similar to compounds such as subordinate and attributive compounds. The parallelism between RNs and subordinate or attributive compounds strongly suggests that they share morphological properties and that the idea of their unified treatment is on the right track.

5.6. Covert Nominalization

5.6.1. Proposal: Converted Nouns as Compound Nouns

Remember that converted nouns pose a problem to both the two-step and the one-step nominalization approach. The proposed analysis is based on the Bifurcated Lexical Model and along the lines of the one-step nominalization approach. It is therefore necessary to consider how the proposed analysis overcomes the challenges of conversion.

Our idea is that RNs (with overt suffixes like *-ment*) are compounds. If converted nouns are RNs, they should also be compounds. If this is the case, then they should be formed by combining a verb with a nominal element stored in the Dictionary. However, they apparently lack such a nominal element. We would like to propose that converted nouns are made up with a null nominal head that is semi-lexical in nature. The existence of a covert semi-lexical category is argued for by Kayne (2005, 2007) and Corver (2008). Thus, the structure of converted nouns can be represented as follows:

(37) $[_N\ [_V$ drink$]\ [_N\ e]]$

In (37), the silent nominal element listed in the Dictionary is represented by *e*.

This analysis of converted nouns is an extension of Shimada (2013), where silent semi-lexical categories are assumed to be a constituent of compounds. Shimada (2013) argues

that the compounds in (38a), which are characterized as English dvandvas by Bauer (2008), have silent variants of semi-lexical nouns such as *nation* and *company*, as shown in (38b). The silent semi-lexical nouns are represented by the words in capital letters.

(38) a. Austro-Hungary, Aol-Time-Warner, Hewlett-Packard

b. [Austro-Hungary] [NATION]], [Aol-Time-Warner [COMPANY]], [Hewlett-Packard [COMPANY]]

(Shimada (2013: 85))

Shimada (2013) also argues that the nominalization of Japanese verbs involves covert counterparts of semi-lexical nouns. His argument is based on Chae's (2010) observation that the adverbial form (known as "*rennyookei*" in Japanese) *hasir-i* in (39a) means the way of running, not just the event of running. Chae (2010) concludes that a covert element meaning *way* occurs as a head, and it is modified by *hasir-i*, as in (39b).

(39) a. *hasir-i*
running-INF
'the way of running' (Shimada (2013: 84))

b. *hasir-i* [*e*] (Shimada (2013: 85))

Although Chae (2010) does not show what the covert element is, Shimada (2013) argues that it is the covert counterpart of the semi-lexical noun *kata* 'way.' Thus, the structure of the deverbal noun in (39a) is as in (40).[14]

[14] Note that the adverbial forms used as nouns can have various meanings other than the way of the process, as shown in the examples in (i) cited from Martin (1988: 886-887) and Ito and Sugioka (2002: 94).

(40) *hasir-i-KATA*

running-INF-WAY

'the way of running'

(Shimada (2013: 85), with modifications)

Based on Shimada's (2013) analysis of the nominalization of Japanese verbs, I argue that converted nouns in English have *silent nouns stored in the Dictionary* as heads. Canonically, phonologically null elements are stored in the Syntacticon (Emonds (2000)). I argue that such null elements can be turned into Dictionary items via the assignment of purely semantic featues *f* and settle down in the Dictionary; the nominal elements heading converted nouns are such items originated in the Syntacticon. They do not have grammatical roles such as chategory changing, but have referential properties and express concrete objects or entities, as with other normal nouns. They complement the lack of the means to refer to something in the phonologically null form. Importatnly, they have the secondary membership in the Dictionary in that they originated in the Syntacticon. Following the notion of semi-lexicality refined in Section 2.7, we can label them as semi-lexical items.[15]

(i) a. the content of the process: *kangae* 'thought,' *nayam-i* 'worry'
b. the product of the process: *tutum-i* 'bundle,' *hor-i* 'ditch'
c. the agent of the process: *sur-i* 'thief,' *minara-i* 'trainee'
d. the means of the process: *hakar-i* 'scales (for weighing),' *hatak-i* 'duster'
e. the place of the process: *toor-i* 'way, street'

I assume that the deverbal nouns in (i) also have silent variants of semi-lexical nouns. For example, the noun *nayam-i* has the covert counterpart of the semi-lexical noun *koto* 'thing,' as in (ii).

(ii) *nayam-i-KOTO*
worrying-inf-THING
'worry'

A detailed analysis of these nouns will be required to identify what silent semi-lexical nouns are employed.

[15] In Section 2.7, we defined semi-lexical categories as follows:

Note that they have different properites from heavy affixes like *-ment* that undergoes Deep Insertion. Whereas silent nominals in the Dictionary originated in the Syntacticon but settle down in the Dictionary, heavy affixes can be Dictionary Items only when they undergo Deep Insertion.

Semi-lexical nouns in the Dictionary play an important role in Verb-to-Noun Conversion: the silent nouns in the Dictionary are combined with verbs, forming V+N compounds, that is, verbs being converted into nouns. The process of Verb-to-Noun conversion can be summarized as in (41).

(41) Verb-to-Noun Conversion

Verb-to-Noun conversion is a process where a verb is combined with a silent semi-lexical noun in the Dictionary.

The nominalization by conversion thus does not need a zero-suffix functioning as a nominalizer.[16] Given the process stated in (41), the converted noun *drink*, for example, has the structure in (42) at the beginning of the derivation.

(42) $[_N\ [_V$ drink$]\ [_N$ ENTITY$]]$

The silent element *ENTITY* represents a semi-lexical noun that expresses a highly general

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(i) Semi-lexical categories are the secondary items in the lexical component that list them.

[16] Given this analysis, an anonymous *EL* reviewer wonders how a zero-suffix deriving verbs from nouns and adjectives would be handled in the Bifurcated Lexical Model. Emonds (2000: 100, note 28) states that converted verbs "can be best analyzed as resulting from empty right-hand heads." Following Emonds (2000), I assume that a zero-suffix functioning as a verbalizer exists in the Syntacticon and its attachment to nouns and adjectives yields converted verbs. A detailed analysis of this topic is beyond the scope of this chapter, and so I leave it for future research.

class of entities including things or objects and persons.

5.6.2. Evidence

5.6.2.1. Parallel Behaviors between Converted Nouns and Compound Nouns

If converted nouns are compounds, it is predicted that they can be interpreted in a similar way as with uncontroversial compounds. In *drink ENTITY*, for example, the silent element (i.e. the second constituent) has an object-oriented relation to the first constituent. That is, *ENTITY* can be interpreted as the object selected by the verb *drink*, yielding the meaning "entity that is drunk." The object-oriented relations are also observed in the converted nouns in (43).[17]

(43) object-oriented: answer, award, exhibit, pickles

For example, *exhibit* means "objects that are exhibited," and *pickles* expresses "objects that are pickled." As is the case of RNs with overt suffixes, not only object-oriented relations but also subject- and adjunct-oriented relations can be observed in converted nouns, as in (44).

(44) a. subject-oriented: bore, cheat, coach, cook, cover, guide, judge, rattle, spy, wrap, wrench

b. adjunct-oriented: divide, retreat, rise, sink, stop, turn

As with the compound in (42), the converted nouns in (44a, b) also have a silent nominal head, which serves as a subject and an adjunct, respectively. For example, *cheat* in (44a)

[17] The examples in (43)-(45) are adopted from Namiki (1985: 64-65).

means “an entity (= person) that cheats (someone)” and *stop* in (44b) means “an entity (= place) at which a bus or train stops.” In addition to these interpretations similar to subordinate compounds, converted nouns can just name the action or event that the verb expresses and its result, as is expected. Such converted nouns are exemplified in (45).

(45) a. action: attack, attempt, fall, hit, laugh, promise, search

b. result: desire, dismay, doubt, feat, hate, love

In these compounds, a verbal element modifies a silent noun with the meaning of the action or result, as well as the compounds in (36).

5.6.2.2. Nominalization of Phrasal Verbs

Further support for the compound analysis of converted nouns comes from data on the nominalization of phrasal verbs. Phrasal verbs can be classified into two types: those with aspectual particles and those with non-aspectual particles. For example, the phrasal verb *drink up* contains the aspectual particle *up*, which has the meaning of completion (“completely”). On the other hand, the particle *up* in the phrasal verb *look up* is non-aspectual in that *look up* has the idiomatic meaning “to consult.” Within the framework of Emonds (2000, 2005), I argue elsewhere (Naya (2015)) that aspectual and non-aspectual particles undergo different derivational processes. More precisely, I argue that aspectual particles undergo Syntactic Insertion and non-aspectual particles Deep Insertion. If so, phrasal verbs have the structures in (46) at the beginning of the derivation:

(46) a. phrasal verbs with aspectual particles

[$_V$ [$_V$ drink] [$_{Part}$]]

b. phrasal verbs with non-aspectual particles

[$_V$ [$_V$ look] [$_{Part}$ up]]

(Naya (2015: 94), with slight modifications)

Recall that noun-forming conversion is a process of combining a verb with a silent semi-lexical noun inserted from the Dictionary. Then, given that phrasal verbs with aspectual particles are already formed at the beginning of the derivation, it is predicted that they can be combined with a silent semi-lexical noun, yielding verb-particle nouns, as represented in (47).

(47) [$_N$ [$_V$ look up] [$_N$ ENTITY]]

In contrast to non-aspectual particles, aspectual particles are not inserted until the level of Syntactic Insertion, as represented in (46a). If so, we can predict that phrasal verbs with aspectual particles cannot be combined with a silent semi-lexical noun and, as a result, they cannot be converted into nouns. These predictions are correct. According to Miller (2013), phrasal verbs can undergo noun-forming conversion unless they contain particles with aspectual meanings, as shown in (48).

(48) a. *a drink-up (of water), *a chew-up (of food), *a finish-up (of the work), *an eat up (of food) (Miller (2013: 35))

b. a look-up, a break-up, a fill-up, a wind-up

(Miller (2013), with modifications)

These data support the idea that converted nouns are formed by combining a verb and a silent

semi-lexical noun inserted via Deep Insertion from the Dictionary.[18]

The existence of a nominal head in verb-particle nouns is further supported by the fact that they are frequently used as pre-nominal modifiers. For example, let us observe the verb-particle noun *giveaway* in the following examples, which are cited from the official Collins English Dictionary online.

(49) a. House wine is a giveaway at about £1.50.

b. The giveaway, apparently, was his choice of colour.

(http://www.collinsdictionary.com/dictionary/english/giveaway)

In (49a), *giveaway* refers to a thing that is given to people for free or very cheaply. In (49b), the noun means something that tells or shows something secret. What is crucial here is that *giveaway*, but not aspectual phrasal verbs, can serve as a modifier of overt nouns. The *OED* notes that *giveaway* is frequently used attributively, as the examples in (50) show.

(50) the giveaway game, Give-away festivals, a giveaway show, ‘giveaway grants’, a big ‘give-away’ show, a ‘give-away’ Budget

The examples in (51) and (52), cited from the official Collins English Dictionary online, also show that *giveaway* functions as a pre-nominal modifier:

(51) a. Wine and food of superlative quality are available everywhere at giveaway prices.

[18] Naya et al. (2013) provide another account of the difference between the two types of phrasal verbs in conversion within the framework of Distributed Morphology.

b. giveaway tickets to a variety of live events

(52) a. With those giveaway words ‘we have the will to win’, Betty was in danger of appearing to concede the fight.

b. giveaway signs

(http://www.collinsdictionary.com/dictionary/english/giveaway)

In (51), *giveaway* modifies *prices* and *tickets*, meaning that *prices* are very cheap and *tickets* are free of charge. In (52), *giveaway* modifies *words* and *signs*, meaning that *words* or *signs* are the things that tell or show something secret. Notice here that the meanings of *giveaway* in (51) and (52) correspond to those in (49a) and (49b), respectively. Given this semantic parallelism, although *giveaway* in (49) seems to stand alone, it is reasonable to assume that *giveaway* in (49) is a pre-nominal modifier of a silent noun, as in (53).

(53) $[_N\ [_V$ giveaway$]\ [_N$ ENTITY$]]$

That is, just as *giveaway* modifies overt (lexical) nouns in (52)-(54), it modifies a covert (semi-lexical) noun in (49). Accordingly, the examples observed so far support the analysis of converted nouns as compounds headed by silent semi-lexical nouns.

Given the proposed structure in (42), which is repeated as (54), we can answer the question raised in Section 5.3.3: Why is it that converted nouns cannot function as CENs?

(54) $[_N\ [_V$ drink$]\ [_N$ ENTITY$]]$ (= (42))

Since, as mentioned in (41), the silent noun in (54) is a member of the Dictionary, the noun is forced to undergo Deep Insertion; that is, it must be inserted at the beginning of the

derivation. As a result, the noun serves as the head of the structure throughout the derivation, which prevents the verbal element *drink* from being the head. Accordingly, the verb cannot select arguments, and hence, the resultant structure lacks an argument structure. What is important here is that silent nouns are necessarily inserted in this way because other types of insertion (e.g. Syntactic Insertion) are not available to them. Therefore, converted nouns are always RNs and cannot function as CENs.

In this section, I have proposed that RNs are strikingly different from CENs in terms of their morphological status; namely, while CENs are derivatives, RNs are compounds. In the case of the RNs with overt suffixes like *-ment*, the suffixes are assigned purely semantic features *f* when they undergo Deep Insertion. I have also argued that converted nouns, which behave as RNs, employ silent semi-lexical nouns listed in the Dictionary as the head. Since both nominals with and without overt suffixes have semi-lexical categories in head position, RNs and converted nouns can be grouped together into the class of compounds whose head belongs to semi-lexical categories.[19]

5.7. Implications for Competition in Word-Formation[20]

5.7.1. Deverbal Nominalization by *-ment* vs. Conversion

The analyses of RNs proposed in this chapter have implications for competition and blocking in word-formation. Aronoff (1976: 43) defines morphological blocking as "the

[19] As an anonymous *EL* reviewer points out, converted deverbal nominals can appear in the light verb constructions, as shown in (i).

(i) a. take a look at something
b. have a drink of something

I argue that the converted nouns in these constructions (e.g. *a look*, *a drink* in (i)) are also compound nouns. The analysis of these whole constructions is, however, beyond the scope of this chapter, and so I leave it for future research.

[20] This section is an extended and revised version of Naya (2017b).

nonoccurrence of one form due to the simple existence of another." Blocking can be observed in nominalization. For example, the suffixes *-ment* and *-ation* can derive nouns from verbs, but they cannot be attached to the verb *occur*, as shown in (55).

(55) a. * occurment (< occur + -ment)

b. * occuration (< occur + -ation)

(cf. Aronoff (1976: 60))

According to Aronoff, this is because the existing form *occurrence*, derived by the suffix *-ence*, blocks *occurment* and *occuration*. In this way, nominal suffixes are in a competitive relationship, and earlier derivatives win out over later ones.

The notion of blocking raises an interesting question when we consider RNs. Importantly, RNs can be formed not only by overt suffixation but also by conversion. Some previous studies analyze conversion as zero-suffixation, namely, suffixation of a zero suffix to a verbal base (e.g., Marchand (1969) and Kiparsky (1982), among others)). Under this analysis, conversion is unified into a familiar process of overt suffixation. If so, a zero suffix is in rivalry with overt nominal suffixes (e.g., *-al*, *-ance*, *-ation*, *-ment*, etc.). Accordingly, it is natural that the zero nominalizer *-Ø* and overt suffixes are in complementary distribution, resulting in the blocking of a later emerging RN by an earlier one.

Within our analysis, however, suffixed RNs and converted RNs are formed differently. While the heads of the both RNs are inserted by Deep Insertion, they have different categorial natures and undergo different processes before the insertion; the head of a suffixed RN (e.g., *-ment*) is originally in the Syntacticon and turned into a lexical item in the Dictionary when it undergoes Deep Insertion, but that of a converted RN (e.g., *ENTITY*) is listed in the

Dictionary in the first place. If blocking is sensitive not only to sharing underlying structures but also to sharing the same derivational processes, the two forms do not (necessarily) block each other.

In this way, the zero-suffixation analysis and our analysis make different predictions; the former predicts the competition (and blocking) between a *-ment* form and its converted counterpart, but the latter does not. In order to examine these different predictions, Section 5.7.2 observes whether the two forms can co-exist or not based on the *OED* search. The search indicates that they can occur as nominalized forms of a given verb. Section 5.7.3 discusses the relationship between competition in word-formation and the processes which yield RNs.

5.7.2. Observation: Nominalization by *-ment* vs. Conversion

This section shows that a suffixed noun and converted noun do not necessarily block each other by observing the relationship between RNs formed by *-ment* suffixation and those formed by verb-to-noun conversion.

5.7.2.1. Semantic Factors for Blocking

Using the *OED*'s Advanced Search function, I collected 224 relevant *-ment* nouns in total. The *OED* search revealed that among the 224 nouns, 87 examples have converted noun counterparts.[21] This might appear to indicate that the prediction by the zero-suffixation analysis is incorrect. However, such a conclusion would be hasty. Note the following statement in Aronoff (1976: 60): "It is perfectly possible to have more than one

[21] Note that not all suffixed-nominals start out as result nominals. As discussed in this chapter, some are first used as CENs. In such cases, I cite the dates when the nouns were first used as result nominals.

nominal in a given stem, as long as the nominals do not have the same meaning."[22] This is true for the case of zero-derived nouns (or converted nouns) and *-ment* nouns, as shown by Aronoff's (1976: 60) examples in (56).

(56)

	-Ø	*-ment*
a.	advance_{N}	advancement
b.	ecape_{N}	escapement
c.	abandon_{N}	abandonment

The nouns *escape* and *escapement* in (56b), for example, are not synonymous in that *escape* means the action of escaping, but *escapement* refers to a piece of machinery in a clock or watch. Thus, the two forms can co-exist. The examples in (56) indicate that to examine whether the prediction is correct or not, we need to consider the meanings of *-ment* nouns and their converted counterparts. If the two forms have different meanings, their cooccurrence would be unsurprising. More crucial examples, however, are pairs that share the same meanings. With this in mind, we will classify the collected data in the next subsection.

5.7.2.2. Competition between *-ment* and a Zero Suffix?

Based on the descriptions and definitions in the *OED*, I classified the 87 doublets by semantic differences between the forms (i.e., whether or not they are synonymous) and the diachronic order of their first occurrence (i.e., which form is attested first). The results are shown in the table in (57).

[22] See also Maiden (1992, 2004) for morphological strategy of synonymy avoidance.

(57)

	Synonymy	No synonymy
-ment N → counverted N	(i) 31 doublets (Approx. 36%)	(iii) 5 doublets (Approx. 6%)
converted N → *-ment* N	(ii) 41 doublets (Approx. 47%)	(iv) 9 doublets (Approx. 10%)
-ment N = converted N	1 doublet[23]	N/A
Total	73 doublets (Approx. 84%)	14 doublets (Approx. 16%)

Certainly, there are cases that conform to the prediction from Aronoff's discussion; the rightmost column of the table indicates that in 14 doublets, the two forms have different, non-synonymous meanings. The 5 doublets have *-ment* forms first and the 9 doublets converted forms first. However, in the other 73 cases, the two forms of a doublet co-exist despite being synonymous, regardless of the order of appearance.

Let us examine the data in detail. First, as just stated, there are 14 non-synonymous doublets. In 5 of these, a *-ment* noun appeared earlier than its converted counterpart. The doublets are shown in (58).[24]

(58) endorsement, endorse / instalment$_1$, install / †dilatement, †dilate / †referment, †refer / †seizement, seize

For example, observe *endorsement* and *endorse* in (59).[25]

[23] The verb *allure* has suffixed and converted forms (i.e., *allurement* and *allure*), both dating from 1548. In what follows, we do not take these examples into consideration.

[24] The dagger '†' indicates that the word in question is obsolete.
The *OED* treats homographs as separate entries. The entry relevant to the discussion is indicated by a subscript.

[25] The examples and the definition of the words in this subsection are cited from the *OED*.

(59) a. 1547 The same Endorsement to be signed with the Hand of the said Warden.

b. 1572 An Endorce..is the fourth parte of the Pallet.

The *-ment* noun *endorsement* started out as a result nominal in 1547 with the meaning of 'a signature, memorandum, or remark endorsed upon a document,' as in (59a). Its converted counterpart *endorse* came into use in 1572 with a very different meaning from *endorsement*; it started out as a term associated with heraldry, meaning '[a] vertical division of a shield, one-eighth (others say one fourth) of the breadth of a pale,' as indicated in (59b). Given the semantic differences between the two forms, we can regard them as non-synonymous.

The same relationship can be observed in the 9 cases in which a converted noun emerges earlier than a corresponding *-ment* noun. These are exemplified in (60).

(60) hurl, hurlment / consort$_2$, †consortment / praise, †praisement / †enfold, enfoldment / †enrage, enragement / †enroll, enrolment / †invest, investment / †represent, representment$_1$

Let us take *enfold* and *enfoldment* in (61), for example.

(61) a. 1578 The brayne..seemeth to shew many infoldes and turnynges.

b. 1593 That in mine amorous enfoldment, I might whyrle her [lerusalem] to Heauen with me.

The converted noun *enfold* in (61a), whose first citation date is 1578, has the meaning of 'a convolution (of the brain or intestines).' On the other hand, its converted counterpart

enfoldment in (61b) came into use in 1593, referring to the action of enfolding. Given these meanings, the two forms are judged non-synonymous.

The non-synonymous examples in (59) and (60) are unproblematic for the notion of blocking. However, the situation is different in the 72 doublets in the table in (57), which have important implications for the notion of blocking. However, note that these data need to be further classified here. This is because in some such instances, a later form started out as a non-synonymous word for the earlier one but subsequently, somehow became synonymous. For illustration, let us observe *defeatment* and *defeat* in (62) and (63).

(62) *defeatment*

1598 The cause of many <u>defeatments</u>.

(63) *defeat*

a. 1599 […] And made <u>defeat</u> of her virginite.

b. 1600 They had newes in Fraunce of the defeat of the armie.

Defeatment in (62) came into use in 1598 with the meaning of defeat in battle or war. On the other hand, its converted counterpart *defeat* came into use in 1599 with the very different meaning of 'ruin' or 'destruction,' as shown in (63a). However, a meaning similar to that of *defeatment* emerged in 1600; *defeat* in (63b) means 'overthrow in military contest or fight.' In this way, the two forms are synchronically (or at some stage in the history of English, at least) synonymous. The same is true of the examples in (64) and (65), where the converted nominal occurred earlier than the suffixed one.

(64) †*revile*

1579 Hee must heare threates, hee must suffer <u>reuiles</u> and tauntes.

(65) *revilement*

a. 1590 […] Her bitter rayling and foule revilement

b. 1637 He was not..moved with whatsoever revilements.

Revile in (64), which first occurred in 1579, has the meaning of 'a reviling speech or remark.' The suffixed counterpart *revilement* came into use in 1590. Its first meaning is 'the act of reviling; the fact or practice of employing abusive language,' which is exemplified in (65a). However, it also began to be used with the meaning of 'a reviling speech,' as in (65b).

Even though the two forms of these examples are synchronically synonymous, they are not appropriate data here because we need to compare the original meanings of the two forms to demonstrate whether or not blocking has occurred. A close examination of the data on synonymous pairs reveals that 14 instances represent such inappropriate data, as shown in the table in (66).

(66)

	The later form started out as	
	a non-synonym for the earlier one	a synonym for the earlier one
-ment N → counverted N	(i) 6 doublets	(iii) 25 doublets
converted N → *-ment* N	(ii) 8 doublets	(iv) 33 doublets
Total	14 doublets	58 doublets

We do not discuss here how the two forms became synonymous in the 14 doublets (see the tables in (84) and (85) in Appendix). The other 58 doublets are more relevant for our purposes. Let us examine them in detail.

In 25 of the 58 doublets, a *-ment* noun occurs earlier than its converted counterpart, both with similar meanings. Some of the doublets are in (67) (see the table in (86) in

Appendix for other examples).

(67) brabblement, brabble / discernment, discern / embracement, embrace / mumblement, mumble / resignment, resign / etc.

For example, *mumblement* in (68a) emerged in 1595 with the meaning of something mumbled or muttered. Despite the earlier existence of *mumblement*, the converted synonymous noun *mumble* appeared in 1902, referring to a mumbled indistinct utterance or sound, as in (68b).

(68) a. 1595 Such his mumblement being ouer-heard came afterwrdes in question to his danger.

b. 1902 A series of mumbles and grunts.

A similar pattern can be observed in another 33 doublets, in which converted and suffixed forms emerged in the reversed order of appearance. Some of these are exemplified in (69) (see the table in (87) in Appendix for other examples).

(69) amaze, amazement / countervail, †countervailment / dismay, †dismayment / endeavour, †endeavourment / languish, languishment / etc.

For example, although *endeavour* in (70a) already existed, the suffixed noun *endeavourment* in (70b) cooccurs with the same meaning as *endeavour*; both forms refer to the action of endeavoring.

(70) a. 1417 The great laboures, travels, and endevoures made by the said

Lifetenaunte.

b. 1523 Your endeuorment So have ye done.

In this way, in the 58 doublets in total, a later form can occur even with the same meaning as an earlier form.

To sum up, the data observed so far indicate that contrary to the prediction in zero-suffixation analysis, but in line with our prediction, converted RNs and their suffixed nominal counterparts do not block each other.

5.7.3. Competition Sensitive to Derivational Processes

The result shown in Section 5.7.2 suggests that the competition in word-formation compares not only the two resultant structures but also the processes forming them. Thus, we can refine the notion of competition and blocking as follows: Word-formations compete if they share underlying structures and belong to the same type of process. Put simply, blocking is sensitive not only to sharing the same meaning but also to sharing the same derivational processes. Accordingly, if the two forms are produced by the same process, they are mutually exclusive. Conversely, if they are created by different processes, they can co-exist even if they are synonymous and, more importantly, they share the same structures.

The competitive relationship between two forms can be observed in the case of *-er* and *man*, which are both grammatical elements. Under the notion of competition refined here, the two items compete with each other when they undergo Syntactic Insertion and one form is blocked as a result. This is indeed the case, as we have already observed in Section 4.4.2; *taxer* wins out over *taxman*, as in (71).

(71) a. a taxer of hidden assets

b. * a taxman of hidden assets

(Roerper (1987: 267), with a slight modification)

In Section 4.4.2, I argued that *taxman* is blocked because of economy of derivation at PF, which requires the "insert[ion of] as few free morphemes as possible in the course of a derivation" (Emonds (2000: 350, fn. 26)). However, it is still unclear *why the two forms compete with each other in the grammar system*. Under the notion of competition refined here, we can answer this question; *-er* and *man* are both the members of the Syntacticon and are inserted by the same process, Syntactic Insertion. Combined with the economy principle, this refined notion of competition can account for this fact concerning the relationship between *-er* and *man* in (71).

The refined notion of competition also captures the relationship between the two forms of RNs we have observed in this chapter. As discussed in Section 5.6, V-to-N conversion can be analyzed as the process of combining a silent nominal in the Dictionary and a verb. Accordingly, the converted noun *mumble*, for example, is formed by combining the silent noun *ENTITY* with the verb *mumble*, as in (72a). On the other hand, *mumblement* is formed by combining *-ment*, which is turned into a lexical item in the Dictionary, as in (72b).

(72) a. $[_N [_V$ mumble$]$ $[_N$ ENTITY$]]$

b. $[_N [_V$ mumble$]$ $[_N$ -ment$]]$

The two forms share some properties. First, they are headed by semi-lexical elements. Second, their heads are inserted from the Dictionary via Deep Insertion. However, as briefly mentioned in Section 5.7.1, they are not exactly the same in that their heads originate in different components. While the silent noun *ENTITY* is a Dictionary item, *-ment* in RNs

is originally a Syntacticon item and assigned the purely semantic features *f* in the Dictionary. In this sense, converted RNs and suffixed RNs are formed differently. If competition that leads to blocking compares the processes of word-formations, then it is natural that the two forms do not compete. Therefore, they can co-exist.

5.8. Silent Semi-lexical Elements and Adverbial Forms of Japanese Verbs

In Section 5.6, we referred to examples of the nominal use of adverbial forms of Japanese verbs. Regarding such examples as converted nouns, we argued that they are headed by silent nouns as in (73).

(73) a. *hasir-i-KATA*
running-Infl-WAY
'the way of running' (= (40))

b. *nayam-i-KOTO*
worrying-Infl-THING
'worry' (= (ii) in fn. 14))

Note that adverbial forms of verbs can be used as other categories especially when they are combined with another verb. For example, the compounds in (74) are used as verbal nouns.

(74)	a.	*ik-i-ki(-suru)*	go-Infl-come(-do)	'come and go'
	b.	*mi-kik-i(-suru)*	see-hear-Infl(-do)	'see and hear'
	c.	*yom-i-kak-i(-suru)*	read-Infl-write-Infl(-do)	'read and write'
	d.	*ur-i-ka-i(-suru)*	sell-Infl-buy-Infl(-do)	'buy and sell'
	e.	*nobor-i-ori(-suru)*	go.up-Infl-go.down(-do)	'go up and down'

	f.	*ne-oki(-suru)*	sleep-get.up(-do)	‘sleep and get up, sleep schedule’
	g.	*uke-kotae(-suru)*	receive-answer(-do)	‘(have a) comeback, response’

(Ueno (2016: 142))

In addition, the compounds in (75) have the category of adjectival noun.

(75)	a.	*ure-ure*	be.ripe-be.ripe	‘very ripe’
	b.	*mie-mie*	see-see	‘transparent, obvious’
	c.	*bare-bare*	get.out-get.out	‘transparent, blatant’

(cf. Ueno (2017))

Extending the proposed analysis of converted nouns, we can assume that these examples are also headed by silent semi-lexical categories in the Dictionary. More precisely, the examples in (74) are headed by the silent verbal noun *ACTION* and those in (75) by the silent adjectival noun *STATE*, as represented in (76).

(76) a. [*yom-i-kak-i*]-$ACTION_{VN}$

b. [*ur-e-ur-e*]-$STATE_{AN}$

The existence of these silent semi-lexical items will be independently supported by the existence of a certain type of Japanese compound in Chapter 6.

5.9. Summary

In this chapter, we demonstrated that the Dictionary also involves semi-lexical items from the Syntacticon by focusing on the formation of deverbal nouns in English. Semi-lexical nouns in the Dictionary include two types: nominal suffixes inserted via the Dictionary (i.e., heavy suffixes) and silent nominals originating in the Syntacticon but stored in the Dictionary. Based on these newly proposed semi-lexical nouns, we dealt with the issue of the relationship between CENs and RNs.

We first observed the empirical data, including diachronic evidence from the *OED*, and showed that CENs and RNs are independently derived, favoring the one-step nominalization approach. I then showed that the nature of and relationship between CENs and RNs can be captured under the Bifurcated Lexical Model by assuming a new type of semi-lexical noun in the Dictionary. In particular, I proposed that CENs are derivatives but RNs are compounds. I further proposed that nominalizing suffixes can be a kind of lexical category and that the Dictionary can store semi-lexical categories, including silent nouns, that originate in the Syntacticon. RNs contain either heavy suffixes or silent semi-lexical nouns in head position. In contrast to RNs, CENs do not contain such elements. Their head is a nominalizing suffix that serves as a purely grammatical item, so that they are derivatives, as generally argued. Silent semi-lexical nouns cannot behave like such a grammatical item because they are Dictionary items; instead, they function as heads of compound formations. This is why converted nouns, which are headed by silent semi-lexical nouns, serve only as RNs. In short, CENs and RNs are formed via different processes, that is, derivation and compounding. It is for this reason that CENs and RNs can exist independently.

It should be noted that we reached this conclusion by observing only (some) deverbal nouns with *-ment*. The natural question then arises as to whether the same is true of other nominal suffixes or not. The sentences in (77) and (78), which contain deverbal nouns with

the suffix *-ation*, suggest that the suffix also derives CENs and RNs independently.

(77) a. c1386 For as moche as the Examination is necessarie, let us byginne at the Surgiens. (RN)

(Chaucer, Geoffrey *The Tale of Melibee* in *Canterbury Tales*, underlining mine)

b. 1494 The bysshop he commytted to the examinacion & correccion of the clergy. (CEN)

(Fabyan, Robert *The Newe Cronycles of Englande and of Fraunce*, underlining mine)

(78) a. 1472 Youre seid Suppliaunt shall pray to God for the preservation of youre moost roiall estate. (CEN)(*Rolls of Parliament*, underlining mine)

b. 1555 Thankes geuvynge to almyghty god for his delyuery and preseruation from so many imminent perels. (RN)

(Eden, Richard *The Decades of the Newe Worlde or West India*, underlining mine)

The sentences in (77) show that the deverbal noun *examination* first occurred as an RN in about 1386, followed by its first CEN usage in 1494. The opposite order is observed in the sentences in (78); the deverbal noun *preservation* was first used as a CEN in 1472 and subsequently as an RN in 1555. Although more research is needed, it seems reasonable to argue that nominal suffixes (in English) other than *-ment* also derive CENs and RNs independently, and thus the one-step nominalization approach is valid.

In addition, I showed that the proposed analysis of RNs makes a different prediction from that of the zero-suffixation analysis of converted nouns with respect to the relationship

between converted RNs and suffixed ones. I examined which prediction is preferable based on an *OED* search. The search demonstrates that the analysis proposed in this chapter is plausible; the two forms of RNs can co-exist. This fact indicates that word-formations compete if they share equivalent underlying structures and yet are created from the same type of process.

Furthermore, I extended the analysis of N-to-V conversion to adverbial forms of Japanese verbs. Adverbial forms of Japanese verbs function not only as nouns but also as verbal nouns and adjectival nouns. Given the proposed analysis, we can assume that in verbal noun usage and adjectival noun usage, they are headed by silent heads with the categories VN or AN. These silent VN and AN, as well as silent N, are assumed to be listed in the Dictionary. The assumptions concerning these silent elements are not ad hoc. The next chapter shows another role of silent VN and AN, which provides further evidence for the existence of such silent elements.

The semi-lexical categories proposed in this chapter and their roles are the following:

(79) a. *-ment*

b. This item is combined with verbs, forming complex event nominals and result nominals.

c. This item is stored in the Syntacticon. When it undergoes Syntactic Insertion, complex event nominals are formed; when it undergoes Deep Insertion, result nominals are formed.

(80) a. *ENTITY, KATA, KOTO*

b. This item is combined with verbs, forming converted nouns.

c. This item is stored in the Dictionary and undergoes Deep Insertion.

(81) a. *ACTION*$_{VN}$, *STATE*$_{AN}$

b. These items are combined with verbs, forming converted verbal nouns and adjectival nouns.

c. These items are stored in the Dictionary and undergo Deep Insertion.

Appendix to Chapter 5

1. In the following 14 doublets, the two forms are not synonymous.

(82) *-ment* N → converted N: 5 doublets (cf. (iii) in (57))

-ment N	converted N	*-ment* N	converted N
endorsement (1547)	*endorse* (1572)	*instalment*$_1$ (1589)	*install* (1871)
†*referment* (a1558)	†*refer* (1637)	†*dilatement* (1593)	†*dilate* (1595)
†*seizement* (1581)	*seize* (1912)		

(83) converted N → *-ment* N: 9 doublets (cf. (iv) in (57))

converted N	*-ment* N	converted N	*-ment* N
hurl (13..)	†*hurlment* (1585)	*investment* (1597)	†*invest* (1533)
stir (1375)	†*stirment* (c1460)	†*enroll* (1533)	*enrolment* (1535)
praise (14..)	†*praisement* (1638)	†*enfold* (1578)	*enfoldment* (1593)
†*represent* (c1400)	*representment*$_1$ (1594)	*consort*$_2$ (1584)	†*consortment* (1594)
†*enrage* (1502)	*enragement* (1596)		

2. In the following 14 doublets, the later form started out as a non-synonym for the earlier one.

(84) *-ment* N → converted N: 6 doublets (cf. (i) in (66))

-ment N	converted N	*-ment* N	converted N
revengement (1540)	*revenge* (a1547)	†*defeatment* (1598)	*defeat* (1599)
perishment (1548)	*perish* (1825)	†*dribblement* (1599)	*driblle* (c1680)
pronouncement (1593)	†*pronounce* (1600)	†*disposement* (1583)	*dispose* (1590)

(85) converted N → *-ment* N: 8 doublets (cf. (ii) in (66))

converted N	*-ment* N	converted N	*-ment* N
disguise (13..)	*disguisment* (1580)	†*revile* (1579)	*revilement* (1590)
treat$_1$ (1375)	*treatment* (c1560)	*pester* (1585)	*pesterment* (1593)
garnish (1418)	*garnishment* (1550)	†*revive* (1589)	*revivement* (1598)
furnish (1500)	*furnishmnet* (1558)	*polish* (1597)	†*polishment* (1633)

3. In the following 58 doublets, the later form started out as a synonym for the earlier one.

(86) *-ment* N → converted N: 25 doublets (cf. (iii) in (66))

-ment N	converted N	*-ment* N	converted N
†appeachment (1450)	†appeach (1628)	*betrayment* (1548)	†*betray* (1600)
†*imaginement* (1470)	†*imagine* (1594)	*brabblement* (1556)	*brabble* (1566)
†*usurpment* (a1470)	†*usurp* (a1647)	†*letment* (1574)	*let*^{2} (1684)
resignment (c1470)	*resign* (1639)	*revealment* (1584)	*reveal* (1629)

disablement (1485)	†*disable* (1827)	*discernment* (1586)	*discern* (1830)
embracement (1485)	*embrace* (1592)	†*grapplement* (1590)	*grapple* (1601)
disagreement (1495)	†*disagree* (1589)	†*varnishment* (1593)	*varnish* (1601)
encroachment (1523)	*encroach* (1611)	*mumblement* (1595)	*mumble* (1902)
replenishment (1526)	*replenish* (1806)	*disbursement* (1596)	†*disburse* (1608)
entertainment (1531)	†*entertain* (1591)	*embarkment* (1596)	†*embark* (1654)
†*provokement* (1533)	*provoke* (1773)	†*paintment* (1597)	*paint* (1602)
†*dispatchment* (1538)	*dispatch* (1550)	†*wanderment* (1597)	*wander* (1843)
assessment (c1540)	†*assess* (1576)		

(87) converted N → *-ment* N: 33 doublets (cf. (iv) in (66))

converted N	*-ment* N	converted N	*-ment* N
†*assiege* (1375)	*assiegement* (1839)	†*entreat* (1485)	*entreatment* (1560)
†*tarryment* (1560)	*tarry* (c1375)	*recount* (c1489)	†*recountment* (1600)
languish (c1380)	*languishment* (a1541)	†*indite* (1501)	*inditement* (1567)
wail (c1400)	†*wailment* (1593)	*require* (1502)	*requirement* (1530)
endeavor (1417)	†*endeavourment* (1523)	*blemish* (1526)	*blemishment* (1596)
†*prevail* (1420)	†*prevailment* (1590)	†*besiege* (1552)	*besiegement* (1564)
†*renew* (1423)	*renewment* (1571)	*distemper*$_1$ (a1555)	†*distemperment* (1582)
supply (1423)	†*supplyment* (1589)	*prattle* (1555)	*prattlement* (1579)
amaze (1430)	*amazement* (1595)	†*deface* (1556)	*defacement* (1561)
countervail (c1430)	†*countervailment* (1594)	†*discuss* (1556)	†*discussment* (1559)
gaze (c1430)	*gazement* (1596)	†*convict* (1567)	*convictment* (1593)
†*tray* (c1430)	†*trayment* (1468)	†*dismiss* (1589)	†*dismissment* (1591)
†*crease* (c1440)	†*creasement* (1592)	†*enjoy* (1589)	*enjoyment* (1665)
†*restrain* (c1449)	†*restrainment* (1579)	*indent* (1589)	†*indentment* (1597)
†*rejoice* (c1468)	*rejoicement* (1561)	*dismay* (1590)	†*dismayment* (1600),
†*maintain* (1470)	†*maintainment* (c1485)	†*avouch* (1602)	*avouchment* (1677)
†*enclose* (1484)	†*enclosement* (1580)		

Chapter 6

Semi-lexical Categories in Japanese: A Case Study in Japanese Mimetic Compounds

6.1. Introduction[1]

This chapter provides additional evidence for silent elements in the Dictionary like *ACTION*, which are semi-lexical categories in that lexical component, by showing that they occur in a certain type of word in Japanese and what roles they play in word-formation. As outlined in Section 2.4, the Dictionary interfaces with "the mental faculty of culture and human memory" (Emonds (2000: 24)), and thus is an open-class inventory; the Dictionary accepts coinages and neologisms. In this chapter, I demonstrate that silent elements in the Dictionary help elements newly introduced into the Dictionary to relate to other syntactic objects in derivation; otherwise, they cannot be interpreted appropriately.

One of the elements that can be newly introduced to the Dictionary is mimetics (a.k.a., ideophones or expressives), sound-symbolic words that "represent sounds, shapes, texture, or something more abstract such as feelings" (Tsujimura (2005: 137)). Japanese is rich in mimetics, as exemplified in (1).

(1) *don* 'thud,' *wan-wan* 'bowwow,' *syut(-to)* 'swish,' *kira-kira* 'glittering,' *sowa-sowa* 'restless,' *beta-beta* 'sticky'

Typically, the mimetics *don* 'thud,' *wan-wan* 'bowwow' and *syut(-to)* 'swish' describe the sounds produced by certain actions and *kira-kira* 'glittering,' *sowa-sowa* 'restless' and *beta-beta* 'sticky' express visual qualities, manners of actions, and textures of something or someone. Mimetics themselves have been studied in many aspects, especially because they

[1] This chapter is an extended and revised version of Naya and Ikarashi (2017).

are different from other words. For example, mimetics are different from other words in that they "inherently do not have categorial status" (Tsujimura (2005: 144)), though "there is a general agreement about the possible categories of Japanese mimetics in the literature" (Akita (2009: 45-46)).

This categorial status raises an interesting question when they are used in complex words. Given the Right-Hand Head Rule, we predict that a complex word containing a mimetic word as a (seeming) right-hand constituent does not have a specific category; that is, such a complex word also lacks an inherent categorial status. In contrast to this prediction, the complex word has a particular category. For example, the example in (2), which has the mimetic word *don* 'thud,' is used exclusively as a verbal noun.

(2) *kabe-don*
wall-Mim
'the act of a man cornering a woman by placing his arm(s) against a wall with a thud.'

Let us call complex words with mimetics as their right-hand constituents "mimetic compounds." In accordance with the example in (2), mimetic compounds basically have the category VN, which raises the question of how their category is determined. This chapter answers this question by arguing that mimetic compounds are headed by the silent semi-lexical element *ACTION* with the category of VN; that is, *ACTION* mediates between a mimetic word lacking categorial status and other regular words.

This chapter is organized as follows. Section 6.2 observes characteristics of mimetics and mimetic compounds. As briefly noted above, they show apparently peculiar behaviors in terms of the Right-Hand Head Rule. Section 6.3 proposes that mimetic compounds are

headed by *ACTION* and argues that they are not exceptions to the rule. Section 6.4 provides supporting evidence for this proposal. Section 6.4.1 introduces an alternative analysis depending on a reanalysis process, which makes it unnecessary to assume the semi-lexical verbal noun *ACTION* in mimetic compounds. However, this analysis will be shown to be inferior to ours when a certain structural restriction on the left-hand element of mimetic compounds is considered. Section 6.4.2 discusses another possibility where mimetics themselves receive verbal noun status without recourse to the semi-lexical element *ACTION*. This possibility will be rejected from both empirical and theoretical considerations. After excluding these two alternatives to our proposal, Section 6.5 deals with the question of the structural status of mimetic compounds. Specifically, the section examines the possibility that mimetic compounds are a type of post syntactic compound, as discussed in Shibatani and Kageyama (1988). The section rejects this possibility by showing several discrepancies between these two types of compounds, concluding that mimetic compounds are formed pre-syntactically. Section 6.6 discusses the theoretical implications for semi-lexical categories. Section 6.7 summarizes this chapter.

6.2. Mimetic Compounds and Their Basic Properties

6.2.1. Compounds with Mimetics as Their Right-Hand Constituents

According to Kita (1997), mimetics are semantically distinguished from other words (see also Tsujimura (2017)). Kita decomposes their meaning into two dimensions: the analytic dimension and the affecto-imagistic dimension. The former is the dimension where "[a] thought or experience is represented as a proposition [which can be] decomposed into semantic partials," such as quantifiers, bound variables, logical operators and semantic categories like agent, patient and action, and "[a] certain set of combinatoric recursive rules [like function-argument schema (e.g. action (agent, patient))] organizes these semantic

partials into a hierarchical structure" (Kita (1997: 386)). This dimension is "decontextualized in the sense that it is removed from subjective experience" (Kita (1997: 387)). The affecto-imagistic dimension, on the other hand, is where "language has direct contact with sensory, motor, and affective information" (Kita (1997: 380)). Unlike the analytic dimension, the affecto-imagistic dimension "[does] not include the rational construal of [an experience] based on such things as agentivity and causality" (Kita (1997: 387)). Kita argues that mimetics' meaning belongs to the affecto-imagistic dimension, and thus that they awaken native speakers' intuition "that the sound-meaning relationship is direct, immediate, and nonarbitrary" (Kita (1997: 381)). Given these characteristics, we can safely assume that mimetics are in the Dictionary, where the sound-meaning relationship can be established.

Along with native Japanese and Sino-Japanese words, mimetics compose an independent lexical stratum of the Japanese vocabulary because of their particular properties (cf. Shibatani (1990)). It is noteworthy that they "inherently do not have categorial status" (Tsujimura (2005: 144)); this status is specified according to the syntactic environments in which they appear. For example:

(3) a. Noun

Kodomo	*no*	*seiseki*	*ga*	*waruku*	***iraira***	*ga*
child	Gen	grade	Nom	bad	irritation	Nom

tamatta.
accumulated
'Since my child's grades have been bad, my irritation has accumulated.'

b. Adverb

Ano hito wa itumo ***iraira****-to hanasu*.

that person Top always irritated speak

'That person always speaks in an irritated manner.'

c. Verb

Otto no kudaranai hanasi ni ***iraira****-sita*.

husband Gen silly talk at get.irritated

'I got irritated by my husband's silly talk.'

(Tsujimura (2005: 144))

In (3a), *ira-ira* occurs with the nominative marker *-ga*. Since *-ga* normally accompanies nouns, the category of *ira-ira* in (3a) is specified as a noun. In (3b), *ira-ira* is followed by the quotative particle *-to*, by which *ira-ira* can modify the verb *hanasu* 'speak'; thus it gains the status of an adverb. Finally, *ira-ira* in (3c), which is accompanied by the light verb *suru* 'do,' functions as a verb. Among these three categories, the adverbial usage of mimetics is considered to be the most typical (cf. Hamano (1998), Akita (2009)).

Mimetics, as briefly mentioned above, show some idiosyncratic characteristics, which have attracted considerable attention. This does not mean, however, that we have a full understanding of their nature; there seem to be untouched phenomena concerning mimetics. Among these unexplored phenomena is a case where mimetics occur as right-hand constituents of expressions consisting of two words. Below are some attested examples:[2]

[2] The examples cited from the Internet were collected from November 2015 to March 2016 (except for example (4e), which was found in June 2016). When describing the meaning of *kabe-don* in English, we referred to the following Internet article: *Kabe-don! Cornering Women Against the Wall Goes Viral*, available at http://www.japancrush.com/2012/pictures/kabe-don-cornering-women-against-the-wall-goes-viral.htm. We also consulted the Internet dictionary weblio (http://ejje.weblio.jp/) in the description of *mune-kyun.*

(4)

a.	*kabe-don* wall-Mim	‘the act of a man cornering a woman by placing his arm(s) against a wall with a thud.’
b.	*ago-kui* chin-Mim	‘the act of a man tipping a woman’s chin up with his fingers’
c.	*mune-kyun* heart-Mim	‘one’s heart skipping a beat’
d.	*kao-piku* face-Mim	‘twitching of one’s face’ (http://coco.to/movie/20955/review_good/29)
e.	*zitensya-burabura* bicycle-Mim	‘the act of hanging around by bicycle’ (http://arufa.hatenablog.jp/entry/20081004)
f.	*neko-banban* cat-Mim	‘the act of banging the hood of a car before starting the engine in order not to injure a cat hiding under the hood in a cold season.’ (http://headlines.yahoo.co.jp/hl?a=20151119-00000097-it_nlab-life)

As we will discuss in detail in Section 3, these expressions refer to specific events. *Kabe-don* in (4a), for instance, describes a specific act committed by a man directed toward a woman, and *mune-kyun* in (4c) is an emotional experience as in, for example, a romantic situation. The meaning of these expressions depends partially on the (non-)reduplication of mimetics. In (4a)-(4d), the mimetics are not reduplicated, which iconically means that the events occur just once. In (4e) and (4f), on the other hand, the mimetics *bura* and *ban* are reduplicated; *zitensya-burabura* and *neko-banban* thus refer to repeated or continuous actions.

Let us here focus on the phonological aspect of these expressions. They show characteristics of compounds; in most cases, the compounds’ constituents lose inherent accents, and the compounds have one accent (Kubozono (1995)). For instance, *yubi-pattin* ‘finger-Mim (= finger-snap)’ follows this pattern (the location of accent is marked by “ ´ ”):

(5) yubí + pattín → yubipáttin

Although the noun *yubi* and the mimetic word *pattin* have their own accents (the left side of the arrow), the resulting compound receives one accent, constituting a unified phonological word (the right side of the arrow). Notice that some expressions in (4) do not have accents. *Kabe-don* in (4a) is one such expression:

(6) kabe + dón → kabedon

The mimetic *don* is an accented word as indicated on the left side of the arrow in (6), but it is deaccented in *kabe-don*. This phonological pattern is also observed in a certain type of compounds. For example, *syákai* 'society' and *tóo* 'party' are accented words, but when they are combined, the resulting compound lacks an accent, i.e. *syakaitoo* 'Socialist Party' (Kubozono (1988: 153)). This example shows that deaccenting is one way to form a unified phonological word. Although *kabe-don* differs from this example in that the latter is a noun-noun compound, we can conclude that *kabe-don* shows a compound accent pattern.[3]

Having seen expressions like those in (4) with accentual characteristics of compounds, we now turn to their morphological characteristics. These expressions exclude any syntactic operation that violates Lexical Integrity. For example, adjectives are not allowed to modify the left-hand element of a compound. Thus, the adjective *togatta* 'sharp' in (7a) cannot function as a modifier of *ago* 'chin,' the left-hand element of *ago-kui*. The use of pronouns is also not permissible. For example, *soko-don* in (7b) is completely ungrammatical.

[3] Not all noun-noun compounds are deaccented. See Kubozono (1988, 1995) and Tsujimura (2014) for other accent patterns in these compounds.

(7) a. * *togatta* [*ago-kui*]

sharp [chin-Mim]

intended reading: tipping a sharp chin

b. * *Onnanoko-ga* *kabe-ni* *yorikakate-ita.* *Otokonoko-wa*

girl-Nom wall-against lean-Stat.Past boy-Top

onnnanoko-ni *tikayori,* *soko-don* *sita.*

girl-Dat approach there-Mim do.Past

'A girl was leaning against the wall. A boy approached her and cornered her by placing his arms against it with a thud.'

Semantically, expressions like (4), though perhaps not all, show non-compositionality, a typical characteristic of compounds. *Kabe-don*, for instance, does not literally mean someone's act of banging on a wall; it has a more specific meaning like 'the act of a man cornering a woman by placing his arm(s) against a wall with a thud.'

These facts lead us to conclude that examples like those in (4) are compounds. For convenience, let us call compounds containing mimetics as their right-hand elements as "mimetic compounds." We can encounter various types of mimetic compounds in our daily lives, which indicates that mimetic compounds are productive.

6.2.2. An Apparent Peculiarity of Mimetic Compounds

Mimetic compounds pose an interesting question when considered in terms of the Right-Hand Head Rule (RHR), which defines the head in the morphological domain: "In morphology, we define the head of a morphologically complex word to be the righthand member of that word" (Williams (1981: 248)). Given this rule, the heads of mimetic compounds ought to be mimetics. Mimetics should thus be categorial determinants of

mimetic compounds as a whole, which means that the compounds should have the same categorial properties as mimetics. However, this is not the case; rather, their category is limited to that of verbal noun (henceforth VN).

To illustrate this point, let us first consider the primary function of mimetics. As mentioned above, mimetics are typically used as adverbs (see example (3b)). It is predicted that mimetic compounds should also serve as adverbs if their heads are mimetics. Contrary to this prediction, however, the examples in (8) show that mimetic compounds cannot co-occur with the marker *-to*, and lack the ability to modify verbs.

(8) a. * *Taro-wa Hanako-o kabe-don-to osita.*
Taro-Top Hanako-Acc wall-Mim-Quot push.Past
lit. 'Taro pushed Hanako against the wall with a thud.'

b. * *Taro-wa kuruma-o neko-banban-to tataita.*
Taro-Top car-Acc cat-Mim-Quot tap.Past
lit. 'Taro banged his car in order not to injure a cat that might be hiding under the hood.'

Kabe-don in (8a) and *neko-banban* in (8b) are followed by *-to*, functioning as modifiers of the verb. Unlike modification by mimetic words, such modification by mimetic compounds results in ungrammatical sentences.[4] Hence, mimetic compounds lack the adverbial usage

[4] An anonymous *EL* reviewer has pointed out that, as opposed to our judgment, the examples in (8) sound natural to him/her, which raises a fundamental question over our generalization that mimetic compounds are restricted to VN. To solve this issue, we tentatively assume that the derivation involved in cases where the examples in (8) are acceptable differs from those where they are unacceptable: When acceptable, they are derived as postsyntactic compounds (see Section 6.5, where we will demonstrate that mimetic compounds are not related to postsyntactic compounds). For instance, (8a) is formed from the underlying structure in (ia) by shortening the accusative marker *-o* as in (ib), where ":" indicates that *kabe* and *don* constitute a postsyntactic compound; we note in passing that (ia) sounds unnatural because of the double object marking.

typical of mimetics in general.

While adverbial usage is not observed, we can easily find mimetic compounds used in nominal environments. For example:

(9) a. *Mizukara-no danna-ni 'kabe-don'-o yookyuu sita.*
own-Gen husband-Dat wall-Mim-Acc requirement do.Past
'[She] required her own husband to do *kabe-don*.'
(http://virates.com/funny/07165456)

b. *'kabe-don'-ga ryuukoo sita haikei*
wall-Mim-Nom vogue do.Past background
'factors behind the increasing popularity of *kabe-don*'
(https://ja.wikipedia.org/wiki/%E5%A3%81%E3%83%89%E3%83%B3)

Kabe-don in (9a) and (9b) is followed by the accusative case marker *-o* and the nominative case marker *-ga*, respectively, which suggests that mimetic compounds have a nominal status.

In addition, mimetic compounds can, at first glance, also be used verbally, as indicated by the following examples:

(10) a. *kabe-don* (*suru*) wall-Mim (do)

(i) a. *Taroo-wa Hanako-o kabe-o don-to osita.*
Taro-Top Hanako-Acc wall-Acc Mim-Quot push.Past
'Taro pushed Hanako against the wall with a thud'
b. *Taroo-wa Hanako-o [kabe:don]-to osita.*

One piece of evidence to support this tentative analysis comes from the interpretation of the compounds. As noted in the text, *kabe-don* has a non-compositional interpretation. (ib), on the other hand, seems to be compositionally interpreted if acceptable at all: *kabe:don* merely describes the sound caused by banging the wall. There may be other speakers who accept sentences like those in (8), but in this paper, we assume that they are unacceptable on the basis of our judgment. We leave this issue open for future research.

b. *ago-kui* (*suru*) chin-Mim (do)

c. *mune-kyun* (*suru*) heart-Mim (do)

d. *kao-piku* (*suru*) face-Mim (do)

e. *zitensya-burabura* (*suru*) bicycle-Mim (do)

f. *neko-banban* (*suru*) cat-Mim (do)

As noted in Section 6.2.1, mimetics serve as verbs when followed by the light verb *suru*. Thus, the examples in (10), where mimetic compounds can co-occur with *suru*, seem to indicate their ability to serve as verbs. However, a moment's reflection will make it clear that mimetic compounds are combined with *suru* in a different way from mimetics. As shown in (11a), mimetic verbs allow the quotative marker *-to* to appear between mimetics and *suru*, but not the accusative case marker *-o*. On the other hand, mimetic compounds exhibit the opposite grammatical pattern: as exemplified in (11b), they tolerate the intervention of *-o*, but not *-to*, between the mimetic and *suru*.

(11) a. *dondon* {*-to* / **-o*} *suru*
Mim {-Quot / -Acc} do
'(Someone) thumps (something).'

b. *kabe-don* {*-o* / **-to*} *suru*

This leads us to conclude that mimetic compounds do not have verbal usage, and are exclusively used as nominal expressions. Notice here that nominal expressions that can co-occur with *suru* are considered to be VNs. For instance, the VN *benkyoo* 'study' permits the form *benkyoo-suru* 'to study,' whereas the noun *enpitu* 'pencil' excludes co-occurrence with *suru* (i.e. **enpitu-suru* 'do pencil') (cf. Kageyama (1993: 256)). Furthermore, when

used with *suru*, VNs can be followed by the accusative marker *-o* (e.g. *benkyoo-o suru*). Thus, the examples given above suggest that mimetic compounds are VNs (not just nouns). In fact, their interpretation is related to eventuality. *Kabe-don* in (4a), for example, is not a mimetic describing the sound *don* 'thud,' but instead expresses the action of banging a wall strongly. Thus, *kabe-don* is a kind of action. Likewise, *mune-kyun* in (4c) does not describe the manner of *kyun*, but the emotional experience of feeling one's heart skipping a beat; it is a type of experience. *Kao-piku* in (5d) is also not a mimetic representing the manner of *piku* 'twitchily, twitching,' but describes the movement of one's face in a particular way.[5]

The above observation raises an interesting question: Why is the category of mimetic compounds confined to VNs? As noted above, they appear to be headed by mimetics, because of which the RHR predicts that the compounds should also be used as adverbs or verbs.[6] To answer this question, we will introduce the semi-lexical category into the analysis of mimetic compounds.

6.3. Proposal

Before addressing the question we have raised, let us first consider the interpretation of mimetic compounds. The mimetic compounds in (4) can be literally paraphrased in sentential form with the light verb *suru* 'do,' as shown in (12).[7] (Notice that the following

[5] Another piece of evidence showing that mimetic compounds are VNs is given in footnote 16 in Section 6.4.2.

[6] Kageyama and Saito (2016: 16) also mention what we call mimetic compounds. They point out that "mimetics resist becoming heads" because they are typically adverbs which rarely function as heads of compounds. They touch on the possibility of analyzing mimetic compounds, but do not provide further discussion of the peculiar behavior under consideration.

[7] When used with the light verb *suru*, mimetics differ from each other in whether the quotative marker *-to* is obligatory. In (12a)-(12d), *-to* is normally required, whereas in (12e) and (12f), it is optional. This observation can be attributed to a phonological tendency among mimetics to prefer being four morae long (Nasu (2002)). More specifically, mimetics consisting of three moras ((12a)-

sentences are provided to clarify the semantic relation between the compounds' constituents; we are not saying that they are underlying forms from which mimetic compounds are derived. The derivational relation between mimetic compounds and sentences like those in (12) will be rejected in Section 6.5.)

(12) a. [*Dareka-o*] *kabe-ni* *don-to* *suru.*
Somewone-Acc wall-Dat Mim-Quot do
'Someone corners someone by banging his/her hand against the wall.'

b. *Ago-o* *kuit-to* *suru.*
chin-Acc Mim-Quot do
'Someone tips someone's chin up'

c. *Mune-ga* *kyun-to* *suru.*
heart-Nom Mim-Quot do
'One's heart skips a beat.'

d. *Kao-ga* *pikut-to* *suru.*
face-Nom Mim-Quot do
'One's face twitches.'

e. *Zitensya-de* [*mati-o*] *burabura(-to)* *suru.*
bicycle-by town-Acc Mim-Quot do
'Someone hangs around in the town by bicycle.'

f. *Neko-no* *tameni* [*kuruma-no* *bonnetto-o*] *banban(-to)* *suru.*
cat-Gen for car-Gen hood-Acc Mim-Quot do

(12d)) incorporate *-to* into their prosodic structure, becoming a four morae long prosodic word; that is why *-to* obligatorily appears. Mimetics consisting of four moras ((12e) and (12f)), on the other hand, does not need to depend on *-to* to follow the phonological tendency, so the use of *-to* is optional. See Nasu (2002) for further discussion.

‘Someone bangs [the hood of a car] for cats.’

What is important here is that *suru* cannot take a subject or object by itself, as shown in (13).

(13) a. * [*Dareka-o*] *kabe-ni suru.*

b. * *Ago-o suru*

c. * *Mune-ga suru.*

d. * *Kao-ga suru.*

e. * *Zitensya-de* [*mati-o*] *suru*

f. * *Neko-no tameni* [*kuruma-no bonnetto-o*] *suru.*

The examples in (12) and (13) show that the light verb *suru* and a mimetic together form one verb, which makes it possible for that verb to take arguments (cf. Kageyama (2007)). Moreover, the argument structure of mimetic verbs is determined by the mimetic type *suru* is combined with. The examples *don-to suru* in (12a) and *kuit-to suru* in (12b) respectively occur with the accusative noun *kabe-o* and *ago-o*, which indicates that they behave as transitive verbs. Examples (12c) and (12d), in which only nominative nouns (*mune-ga* and *kao-ga*) appear, show that *kyun-to suru* and *pikut-to suru* function as intransitive verbs. In (12e), *burabura(-to) suru* refers to one’s intentional act of hanging around, and can be classified into the class of verbs like *aruku* ‘walk’ (which Kageyama (2007) regards as a verb of manner of motion). So it is assumed to have an intransitive, more specifically, unergative, property (as the bracketed part suggests, *burabura(-to) suru*, like a number of unergative verbs, can take a traversal path phrase (cf. Kageyama (2007); see also Shibatani (1978) for a discussion of the syntactic and semantic relation between unergative verbs and accusative marked phrases)). In (12f), *neko* is not in an argument relation with the verb *banban(-to)-*

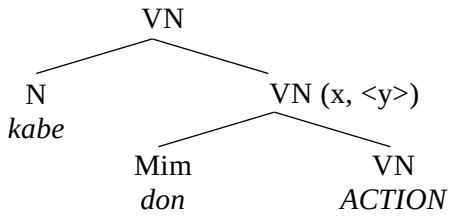
suru, but is interpreted as an adjunct.[8] However, as the bracketed portion suggests, *banban(-to)-suru* functions as a transitive verb.

With this in mind, let us return to mimetic compounds. As mentioned, these can be paraphrased as sentential forms. This paraphrase clarifies that the left-hand constituents in these compounds establish argument-predicate relations in (12a)-(12d) or adjunct-predicate relations in (12e) and (12f) with the mimetics. Recall that mimetics belong to the affecto-imagistic dimension (Kita (1997)). This implies that mimetics by themselves cannot semantically enter into an argument-predicate or an adjunct-predicate relation with the left-hand constituents, which belong to a different semantic dimension from mimetics, namely the analytic dimension. Additionally, they are assumed to be morpho-syntactically unable to make such relations because of their lack of categorial status. Thus, they require some "glue" to be connected with other words. It is reasonable to say that, in the case of sentential forms, mimetics, as shown in (12), depend on the light verb *suru* to gain a verbal status that makes it possible to establish the relations under discussion (see also Tamori and Schourup (1999: 55)). At the morphological level, we can thus predict that the mimetics in mimetic compounds also have recourse to certain elements that enable mimetics to establish argument-predicate or adjunct-predicate relations with the left-hand elements. I thus propose that these relations are ensured by the existence of the silent VN *ACTION* that functionally plays a similar role to the light verb *suru* 'do' in (12); the VN, located in the right-most position, combines with a mimetic, and enables the resulting structure (i.e., [MIM *ACTION*]$_{VN}$) to semantically and morpho-syntactically take arguments or adjuncts. Note that the VN we posit for mimetic compounds lacks semantic content since it behaves like the light verb *suru*, and only serves to ensure a relation between the mimetic and the left-hand

[8] *Neko* can also be interpreted to be an object if the compound is used in other contexts. In this case, the compound means 'Someone bangs a cat.'

element; it therefore only has syntactic features. Thus, we can say that it is a silent semi-lexical item. It is this silent VN that heads mimetic compounds. Under our proposal, the mimetic compound *kabe-don* has the structure in (14), where *x* and *y* represent an external argument and an internal argument, respectively.[9]

(14)



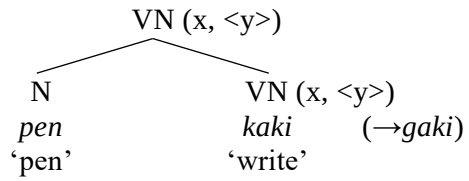
In mimetic compounds, the head *ACTION* is associated with eventuality. A mimetic, the non-head, modifies *ACTION*, specifying the type of event, as is observed in, say, *pen-gaki* 'pen-writing (= writing with a pen),' where the non-head *pen* specifies the type of writing (cf. Sugioka (2002), Ito and Sugioka (2002: Section 3.3)). At the same time, the semi-lexical *ACTION* helps a mimetic that lacks an intrinsic syntactic category to associate with other syntactic objects; a mimetic and *ACTION* are combined at the level of Deep Insertion, thereby yielding a VN that has a specific argument structure, which allows the resultant compound to combine additional elements. In (14), the mimetic *don* describes the sound caused by someone/something's colliding with someone/something else. Thus, the combination of *don* and *ACTION* is assumed to form a VN that is similar to transitive verbs in that it can introduce two arguments, one of which collides with the other. The VN compound *don-*

[9] One might think that the semi-lexical VN *ACTION* has an effect on the accent pattern of mimetic compounds. However, we assume that *ACTION* is not involved in the phonological computation, since it is silent and therefore invisible to the phonological component. Thus, as discussed in Section 6.2.1, the accent pattern is exclusively determined based on the overt elements, namely the left-hand element and a mimetic.

ACTION is then compounded with the noun *kabe*, which bears an adjunct-oriented relation to *don-ACTION*. Since the noun *kabe* is in the Dictionary, this compounding process also occurs at the level of Deep Insertion.[10] In this way, the mimetic compound *kabe-don* is formed.

The structure proposed here is in parallel with the structure assumed for other ordinary deverbal compounds involving adjuncts. For example, Sugioka (2002) argues that *pen-gaki* 'pen-writing' has the following structure (see also Ito and Sugioka (2002: 124)):

(15)



(Sugioka (2002: 298))

In this structure, the adjunct *pen* is adjoined to the verbal noun head *kaki*, whose argument structure is inherited by the whole compound. I argue that the same derivational processes are applied to form mimetic compounds; the only difference in the structures in (14) and (15) is that in mimetic compounds the semi-lexical element *ACTION* makes a mimetic word into a full-fledged word by determining its categorial status and argument structure by combining with it.

In Naya and Ikarashi (2017), we argued that the noun *kabe* has an *object-oriented* relation to *don-ACTION*. Departing from the analysis in Naya and Ikarashi (2017), I argue here that *kabe* has an *adjunct-oriented* relation to *don-ACTION*, as indicated in the paraphrase (12a), which is repeated in (16).

[10] This suggests that *ACTION* should undergo Deep Insertion; otherwise, *kabe* and *don*, which are inserted from the Dictionary, cannot be associated with each other because of the lack of the mediator *ACTION*.

(16) [*Dareka-o*] *kabe-ni* *don-to* *suru.*

Someone-Acc wall-Dat Mim-Quot do

'Someone corners someone by banging his/her hand(s) against the wall.'

If *kabe* were the internal argument of the verbal element *don-ACTION*, the argument structure would be saturated, and as a result, the resultant compound would fail to take an additional argument. However, *kabe-don* can introduce its internal argument, as shown in (17) below:[11]

(17) *Taroo-ga* *Hanako-o* *kabe-don* *sita.*

Taro-Nom Hanako-Acc wall-Mim do.Past

'Taro cornered Hanako by banging his hand(s) against a wall with a thud.'

This example shows that the internal argument of *don-ACTION* is not saturated. Therefore, *kabe* should be regarded as an adjunct.[12]

---

[11] *Kabe-don* in (16) behaves in the same way as deverbal compounds with adjuncts like *pen-gaki*.

(i) *Tegami-o* *pen-gaki* *suru*.
letter-Acc pen-write do
'to pen-write a letter'

(Sugioka (2002: 497), with modifications)

This example provides additional evidence that *kabe-don* and *pen-gaki* have similar structures.

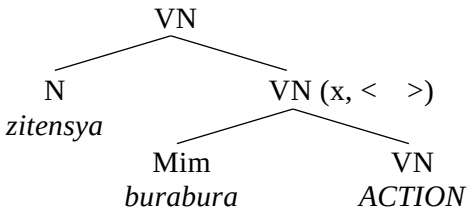
[12] Note that the expression *kabe-don* has another interpretation: 'the act of banging the wall to complain about the noise made by the people living in the adjoining room.' Under this interpretation, *kabe* has an object-oriented relation to *don-ACTION*. If so, we can predict that *kabe-don* used in this sense cannot introduce an additional argument. This is the case, as shown below:

(i) a. ?? *Taroo-ga* *tonari-o* *kabe-don* *sita.*
Taro-Nom adjoining room-Acc wall-Mim do.Past
'Taro banged the wall to complain about the noise made by the people in the adjoining room.'

b. *Taroo-ga* *tonari-ni* *kabe-don* *sita.*
Taro-Nom adjoining room-*NI* wall-Mim do.Past

Adjunct-oriented interpretations can be observed in (18a, b) as well.

(18) a. *zitensya-burabura* 'bicycle-Mim'



'Taro banged the wall to complain about the noise made by the people in the adjoining room.'

As indicated in (ia), it is not natural for *tonari-o*, which has an accusative marker, to occur with *kabe-don (suru)*. In contrast to (ia), the sentence in (ib), where *tonari* is attached to *-ni*, is impeccable. The grammatical contrast shows that *kabe* is the internal argument of *don-ACTION*. (One may think that the sentences in (ia) and (ib) are equally grammatical. If so, *kabe-don suru* is interpreted as a one lexicalized word where the argument relationship between *kabe* and *don-ACTION* is lost.)

One might think that *-ni* in (ib) is a case marker and thus *kabe* is not an internal argument. However, it is not a case marker but a postposition. Sadakane and Koizumi (1995) point out that case markers and postpositions behave differently when they occur in the focus position of cleft sentences; if a case marker appears in the focus position of a cleft construction, the sentence is awkward, as indicated by the contrast in (ii).

(ii) a. ?? *Emi-ga* *bara-no* *hanataba-o* *ageta* *no-wa* *Mika-ni* *da.*
Emi-Nom roses-Gen bouquet-Acc give.Past NL-Top Mika-*NI* Cop
'It's to Mika that Emi gave the bouquet of roses.'

b. *Emi-ga* *bara-no* *hanataba-o* *ageta* *no-wa* *Mika* *da.*
Emi-Nom roses-Gen bouquet-Acc give.Past NL-Top Mika Cop
'It's to Mika that Emi gave the bouquet of roses.'

(Sadakane and Koizumi (1995: 12), with a modification)

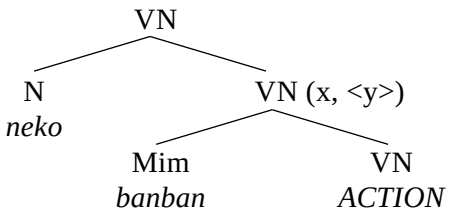
Applying this test to the *ni*-phrase in (ib), we observe that the particle *-ni* can occur in focus position, as shown in (iiia). Therefore, the particle *-ni* in (ib) is a postposition, which indicates that *kabe* in *kabe-don* in (ib) is an internal argument of *don-ACTION*.

(iii) a. *Taroo-ga* *kabe-don* *sita* *no-wa* *201-ni* *da*.
Taro-Nom wall-Mim do.Past NL-Top Room 201-*NI* Cop
'It is against Room 201 that Taro did *kabe-don*.'

b. ? *Taroo-ga* *kabe-don* *sita* *no-wa* *201* *da*.
Taro-Nom wall-Mim do.Past NL-Top Room 201 Cop
'It is against Room 201 that Taro did *kabe-don*.'

I also need to point out that as the example in (iiib) shows, the particle *-ni* in the focus position can be omitted and the resultant sentence does not sound so awkward. This may be because the sentence is interpreted as a pseudo-cleft where the nominalizer *no* can be replaced by *room*. If so, the high acceptability of the sentence (iiib) is not problematic to our analysis in which the particle *-ni* is a postposition.

b. *neko-banban* 'cat-Mim'



In (18a), the combination *burabura-ACTION* refers to the intentional act of hanging around. In this sense, as the sentential paraphrase in (12e) shows, it is assumed to have an unergative characteristic. Notice that, as with the case of *kabe* in (14), the noun *zitensya* is not considered an argument of *burabura-ACTION*; it evokes the adjunct-oriented relation 'by bicycle.' It is assumed that compounds whose heads are unergative VNs generally take an adjunct, not an external argument, as their left-hand element (cf. Kageyama (1993)). (18a) thus conforms to this general tendency. In the case of *neko-banban* in (18b), the mimetic *banban* and *ACTION* together form a VN compound that is similar to a transitive verb. The noun *neko*, however, does not establish an argument relation with the VN *banban-ACTION*; rather, it bears the adjunct-oriented relation 'for the sake of a cat.'[13, 14]

[13] An anonymous *EL* reviewer has raised the possibility that *neko* in *neko-banban* establishes an indirect-object-oriented relation with *banban-ACTION* because *neko* is assumed to be a beneficiary of the act of banging the car hood, as with *Mary* in *John bought Mary a book*. However, indirect objects are normally not allowed to be compounded with verbal elements (see Kageyama (1993: 198) for further discussion). We will thus assume in our discussion that *neko* induces the adjunct-oriented relation.

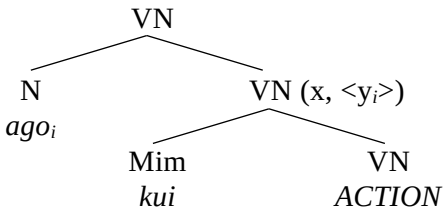
[14] An anonymous *EL* reviewer has pointed out that *don-ACTION* of *kabe-don* can introduce its subject, i.e. an external argument, with the genitive marker *-no* in its Spec position, as in (i).

(i) *John-no* *kabe-don* *kakkoii*.
John-Gen wall-Mim cool
'John's *kabe-don* is cool.'

In this example, *John* can be interpreted as the subject of *don-ACTION*. We assume that the argument structure of *don-ACTION* is inherited by the mimetic compound *kabe-don* as a whole. The inheritance of arguments can be easily found in compounds headed by VNs. For example, Sugioka (1989: 171) gives the following example:

In addition, some mimetic compounds involve an argument-oriented relationship between the left-hand element and *Mim-ACTION*, as represented in (19).

(19) a. *ago-kui* 'chin-Mim'



b. *mune-kyun* 'heart-Mim'

(ii) *mondai-no* *sooki-kaiketu*
problem-Gen early-resolution
'an early resolution of the problem'

The compound *sooki-kaiketu* contains the VN *kaiketu* as a head. Importantly, the noun *mondai* corresponds to the object of *kaiketu*. This can be explained by assuming that the argument structure of the head *kaiketu* is inherited by the whole compound. The parallelism between this example and the example in (i) supports the assumption that *don-ACTION* contains the argument structure, which is inherited by the whole mimetic compound. We would like to thank the reviewer for his or her invaluable comments.

The same reviewer has also pointed out that *mune-kyun* can co-occur with *Hanako-no*, as in (iii); this fact shows the transitive nature of *kyun-ACTION*.

(iii) *Hanako-no* *mune-kyun*
Hanako-Gen heart-Mim
'Hanako's heart's skipping a beat.'

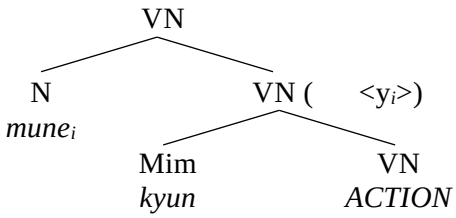
However, as discussed in context, *kyun-ACTION* can be considered unaccusative; *Hanako* cannot be interpreted as the external argument *kyun-ACTION*. In fact, (iii) cannot be paraphrased as (iv), where *Hanako* occurs with the nominative marker and *mune* with the accusative marker.

(iv) * *Hanako-ga* *mune-o* *kyun-to* *suru*.
Hanako-Nom heart-Acc Mim-Quot do
lit. 'Hanako experiences her heart skipping a beat.'

Rather, we suggest the following paraphrase, in which *Hanako-ga* and *mune-ga* appear as multiple subjects.

(v) *Hanako-ga* *mune-ga* *kyun-to* *suru*.
Hanako-Nom heart-Nom Min-Quot do
'Hanako experiences her heart skipping a beat.'

So, as noted in the text, we assume that *kyun-ACTION* carries unaccusativity.



As represented in (19a), *kui-ACTION* in the compound *ago-kui* is assumed to have the same argument structure as *kabe-don*. In *ago-kui*, however, *kui-ACTION* is combined with *ago*, which is interpreted as the internal argument of *kui-ACTION* (see the paraphrase in (12b)).[15] The combination of *kyun* and *ACTION* in (14b) is similar to intransitive verbs in that it only introduces one argument. The VN compound *kyun-ACTION* is in turn combined with the noun *mune*, which bears a subject-oriented relation to *kyun-ACTION*; the mimetic compound *mune-kyun* is thus formed. Notice here that *kyun-ACTION* is assumed to be equal to an unaccusative. Firstly, *mune-kyun* means an unintentional change occurring in one's heart, namely 'one's heart skipping a beat.' For another, the light verb *suru* in the paraphrase in (12c) can be replaced with the verb *naru* (i.e., *mune-ga kyun-to naru*). *Naru* represents change of state, that is, unaccusativity (Kageyama (1993); see also Kageyama (1996)). Thus, the fact that *kyun* is compatible with *naru* indicates its potential relation to unaccusativity. We assume that the unaccusative nature of *kyun* is inherited by *kyun-ACTION*, which thus has the same argument structure as unaccusative verbs. *Piku* in *kao-piku* in (4d) can also be considered a similar example (cf. *kao-ga pikut-to naru*). Thus, we assume that *kao-piku* in (4d) has the same structure as *mune-kyun*.

[15] If *ago* in the compound *ago-kui* saturates the internal argument of *kui-ACTION*, the compound cannot introduce an additional internal argument. As predicted, the nominal element with an accusative marker does not occur with *ago-kui*:

(i) ?? *Taroo-ga* *Hanako-o* *ago-kui* *sita*.
Taro-Nom Hanako-Acc chin-Mim do.Past
'Taro tipped Hanako's chin up.'

We are now in a position to answer the question raised in Section 6.2.2: Why is the category of mimetic compounds confined to VN? Mimetic compounds include the silent semi-lexical VN *ACTION* in their head position; their categorial status is determined by *ACTION*. This is why mimetic compounds are VNs. Semi-lexical categories provide us with a solution to capture the peculiar characteristics of mimetic compounds. This means that they play a crucial role at the word-formation level, to which previous studies have paid little attention. In what follows, we will present evidence that supports our proposal.

6.4. Supporting Evidence: The Categorial Status of Mimetic Compounds

This section demonstrates the necessity, as proposed in Section 6.3, to assume the semi-lexical VN *ACTION* in mimetic compounds. In Sections 6.4.1 and 6.4.2, we will discuss alternative analyses that, unlike ours, do not postulate *ACTION* in the structure of mimetic compounds. These alternatives will then be rejected because of empirical and/or theoretical problems, which our analysis can successfully account for.

6.4.1. Mimetic Compounds and Argument Structures

In Section 6.3, we proposed that a mimetic compound is formed by first combining a mimetic with the semi-lexical VN *ACTION* and then combining the resulting structure with a noun. It should be noted here that there is another possible analysis: A mimetic and a noun are directly combined and the combined structure becomes a VN through certain processes such as reanalysis. This possibility is represented in (20).

(20) $[\ [\textit{kabe}]_{N}\ [\textit{don}]_{Mim}\ ]_{Mim}$ —reanalysis→ $[\ \textit{kabe-don}\ ]_{VN}$

Under this alternative analysis, we do not need to assume the semi-lexical VN *ACTION* to

guarantee the categorial property of the compounds. However, there is a case that cannot be accounted for by the alternative analysis in (20). This case is, however, successfully captured by our proposal relying on the semi-lexical VN *ACTION*.

To illustrate this point, let us observe the interpretations of the left-hand elements in the mimetic compounds in (21).

(21) a. *kabe-don* wall-Mim [Adjunct/Object]

b. *atama-don* head-Mim [Adjunct]

(http://matome.naver.jp/odai/2141316277615429301)

c. * *otoko-don* man-Mim [Subject]

As noted in Section 6.3, *kabe-don* has a transitive interpretation in that it can be paraphrased as follows:

(22) [*Dareka-o*] *kabe-ni* *don-to* *suru.*

Someone-Acc wall-Dat Mim-Quot do

'Someone corners someone by banging one's hand(s) against the wall.'

(=(12a), (16)))

It was also pointed out that *kabe* in this example bears an adjunct-oriented relation. Likewise, *atama-don* in (21b) means the act of a man cornering a woman by placing his head, instead of his arm(s), against a wall with a thud. That is, *atama* 'head' in this compound is an adverbial element expressing the means by which the act in question is undertaken. In this sense, *atama* has an interpretation similar to an adjunct. In addition, there is another possible relation that the left-hand noun can have. As mentioned in footnote 12, *kabe* can

also be interpreted as an object-oriented relation to *don(-to suru)* under certain interpretation of *kabe-don*. These examples indicate that the mimetic compounds allow their left-hand elements to be adjuncts or objects. However, the situation is different for *otoko-don* in (21c). This compound is formed to mean the act of *otoko* 'man' performing *kabe-don*. That is, the left-hand element *otoko* is interpreted as a subject. However, the compound cannot be interpreted in this way.[16] This example suggests that a subject-oriented element cannot be the left-hand constituent of mimetic compounds. Put differently, mimetic compounds are interpreted based on the argument structures.

Notice that subject-oriented elements are not entirely excluded from mimetic compounds. Recall that *mune-kyun* has an intransitive interpretation in that the compound can be paraphrased as *Mune-ga kyun-to suru* (cf. (12c)). What is important here is that although *mune* is interpreted as a subject, the compound *mune-kyun* is fully acceptable.

(23) *mune-kyun* heart-Mim [Subject]

The examples in (21) and (23) show that there are some restrictions on the left-hand constituent of mimetic compounds. We will see below that the restrictions seem to be closely related to argument relations. It is difficult to account for why such restrictions are observed if we assume that mimetic compounds are formed by directly compounding a mimetic and the left-hand element as represented in (20). In (20), the left-hand element and a mimetic should be combined without restrictions as to argument relations, which makes it difficult to account for the ungrammaticality of the compound in (21c). On the other hand, we can explain the existence of such restrictions if, as we propose, a mimetic combines with

[16] *Otoko* in this compound cannot be interpreted as an agent of banging someone/something, either.

the semi-lexical VN *ACTION* and the resulting structure introduces arguments. As we will see, our proposal explains our observation in the same way as in the case of deverbal compounds, compounds headed by deverbal nominals.

Previous studies have clarified that the formation of deverbal compounds is constrained by the argument structure of the related verbs. To illustrate this point, let us first observe the following examples, which contain the transitive verb *kuu* 'eat.'[17]

(24) a. *ringo-kui* apple-eat 'eating of apples' [Object]

b. *te-gui* hand-eat 'eating with one's hand' [Adjunct]

c. * *kodomo-kui* child-eat 'a child's eating' [Subject]

cf. *Kodomo-ga ringo-o te-de taberu.*

child-Nom apple-Acc hand-with eat

'The child eats apples with his/her hand.'

((24a, c): Kageyama (1993: 50), with modifications)

The compound in (24a), in which the left-hand position has *ringo* 'apple,' an object of the verb *kuu* 'eat,' is grammatical. In addition, *te* 'hand' in (24b), which can be interpreted as an adjunct, can also be the first constituent. However, the compound in (24c) is not permissible where *kodomo* 'child' is interpreted as the subject of the transitive verb. These data seem to show that elements corresponding to subjects are excluded from deverbal compounds. However, the situation is a little more complicated. Let us next observe the following example, which contains the intransitive verb *kawaru* 'change.'[18]

[17] *Kui* in the compounds in (24a) is the adverbial form of the verb *kuu* 'eat.' In (24b), the form *gui* occurs because the initial consonant of *kui* has undergone sequential voicing, known as *rendaku* in Japanese.

[18] As with the examples in (24), sequential voicing is observed in the compound in (25). The

(25) *kokoro-gawari* heart-change 'change of heart' (Kageyama (1993: 50))
cf. *Kokoro-ga kawaru*. heart-Nom change

The compound *kokoro-gawari* can be paraphrased as *kokoro-ga kawaru* (heart-Nom change). As this paraphrase indicates, the first constituent of the compound *kokoro* is the subject of the verb *kawaru*. Unlike (24c), the compound is grammatical. The grammaticality of the compound in (25) shows that subject-oriented elements can appear in the deverbal elements in certain cases. What is crucial here is that the relations of the first constituents to the argument structures of the relevant verbs are different between (24c) and (25). When the subject of an intransitive verb is an external argument, the resulting compound is unacceptable; on the other hand, when it is an internal argument, the resulting compound is acceptable (cf. Kageyama (1993), Ito and Sugioka (2002)). Let us consider these analyses more concretely. The argument structure of the transitive verb *kuu* 'eat' can be shown as in (26a), where *x* and *y* respectively represent an external argument and an internal argument. Typically, an external argument is realized as a subject. Thus, *kodomo* in (24c), which is interpreted as a subject, is the external argument of the verb *kuu*, yielding an unacceptable compound. Then, what about the intransitive verb *kawaru*? Note here that intransitive verbs can be classified as unergative or unaccusative verbs. *Kawaru* belongs to the latter type. It has been argued that unaccusative verbs like *kawaru* take internal arguments, as seen in (26b).

(26) a. *kuu* 'eat' (x, <y>)
b. *kawaru* 'change' (<y>)

initial consonant of *kawari*, the adverbial form of *kawaru*, has undergone sequential voicing, yielding the form *gawari* in the compound.

The internal arguments of unaccusative verbs are assumed to be realized as subjects. Thus, *kokoro* in (25) is actually an internal argument, and not an external argument. The compound in (25) is fully acceptable if we assume that only internal arguments can be subjects in deverbal compounds.

Let us return to mimetic compounds. As with deverbal compounds, mimetic compounds allow object-oriented elements and adjunct-oriented elements to occur in the left-hand position (e.g., in (21a) and (21b)). Besides this parallelism, the contrast between the compounds in (21c) and (23), where the left-hand elements are both interpreted as subjects, also shows a similarity to deverbal compounds. The argument structures of *don-ACTION* and *kyun-ACTION* in *otoko-don* and *mune-kyun* can be respectively represented as in (27a) and (27b).

(27) a. *don-ACTION*: (x, <y>)

b. *kyun-ACTION*: (<y>)

These argument structures mean that *don-ACTION* is transitive and that *kyun-ACTION* is unaccusative (see Section 6.3). Based on these argument structures, the (un)grammaticality of the compounds in (21c) and (23) can be explained as follows: as with the case of *kodomo-kui* in (24c), *otoko-don* is not grammatical because *otoko* in this compound is an external argument; in *mune-kyun*, on the other hand, *mune* is the internal argument of unaccusative *kyun-ACTION*, and thus the compound is grammatical, just as is *kokoro-gawari* in (25).[19]

[19] For the same reason, it is not likely that mimetic compounds have the structure in (i), where *ACTION* attaches to noun-mimetic complex.

(i) [[*kabe-don*]-*ACTION*]

If we assumed that the left-hand element and a mimetic were directly combined as in (20), it would be difficult to explain the origin of the restriction on the first constituents of mimetic compounds: based on such an assumption, nothing would ensure correct argument relations. On the other hand, it is a valid account for the grammaticality in (21) and (23) to assume that mimetic compounds contain structures where mimetics combine with the semi-lexical VN *ACTION*.

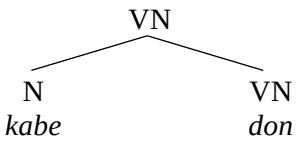
6.4.2. Mimetics and Morphological Processes

This subsection examines another possibility, where mimetics themselves are changed into verbal nouns through some operations. There are (at least) two ways to turn mimetics into verbal nouns, namely reanalysis and derivation. I will then argue that the analysis of mimetics as being combined with *ACTION* in forming mimetic compounds is superior to the alternatives.

The reanalysis of mimetics can be represented in (28a). If a mimetic word can be changed into a verbal noun through reanalysis and attaches to a noun as in (28b), the resultant structure naturally has the category of VN.

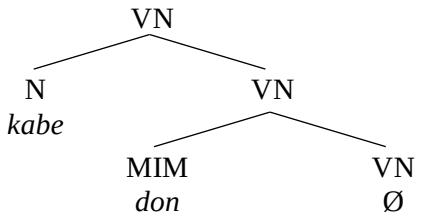
(28) a. [*don*]$_{MIM}$ — reanalysis —> [*don*]$_{VN}$

b.



The second alternative analysis is represented in (29), where the zero suffix *-Ø*, which has the category of VN, attaches to the mimetic instead of the semi-lexical VN *ACTION*.

(29)



If mimetics can undergo reanalysis or suffixation, we no longer need to rely on the semi-lexical VN *ACTION* to account for the categorial status of the compounds and the argument-predicate or the adjunct-predicate relations discussed in Section 6.4.1. Here we need to consider whether mimetics can actually become verbal nouns.

The following examples seem to indicate that the mimetic gains VN status:

(30) a. *Otto no kudaranai hanasi ni* ***iraira****-sita.*
husband Gen silly talk at get.irritated
'I got irritated by my husband's silly talk.' (= (3c))

b. *Kodomo no seiseki ga waruku* ***iraira*** *ga*
child Gen grade Nom bad irritation Nom
tamatta.
accumulated
'Since my child's grades have been bad, my irritation has accumulated.'
(= (3a))

In (30a), the mimetic *iraira* is directly followed by *sita*, which is the past form of the light verb *suru*. As mentioned in Section 6.2.2, co-occurrence with *suru* is one of the characteristics of verbal nouns. As with other uncontroversial verbal nouns, *iraira* can be

used as a noun as in (30c). Thus, one might think that the examples in (30) indicate that *iraira* itself can be turned into a verbal noun through reanalysis or suffixation.

However, this line of analysis is not tenable because the mimetics that apparently have the category of VN behave differently from genuine verbal nouns. Let us first consider the following contrast:

(31) a. *dondon* {*-to* / *-*o*} *suru*
Mim {-Quot / -Acc} do
'(Someone) thumps (something).' (= (11a))

b. *benkyoo* {*-o* / *-*to*} *suru*
study{-Acc / -Quot} do
'(Someone) studies.'

As noted in Section 6.2.2, mimetic verbs allow the quotative marker *-to* to appear between mimetics and *suru*, but not the accusative case marker *-o* as in (31a). VNs, on the other hand, show the opposite behavior; as in (31b), they can be followed by *-o*, but not by *-to*, when used with *suru*. This contrast suggests that mimetics cannot be turned into VN even when they co-occur with *suru*.

Another piece of evidence comes from deletion in coordinate constructions. First, let us observe the following examples where the uncontroversial verbal nouns *ryokoo* and *tozan* co-occur with *si*, the adverbial form of *suru*:

(32) a. *Natuyasumi-ni-wa, ani-wa kaigai-ni ryokoo si,*
summer vacation-in-Top older brother-Top abroad travel do
otooto-wa Huzisan-ni tozan sita.
younger brother-Top Mt. Fuji-Dat climb do.Past
'In summer vacation, an older brother traveled abroad, and a younger brother climbed Mt. Fuji.'

b. * *Ani-wa kaigai-ni ryokoo,*
An older brother-Top abroad travel,
otooto-wa Huzisan-ni tozan sita.
a younger brother-Top Mt. Fuji climb do.Past
'An older brother traveled abroad and a younger brother climbed Mt. Fuji.'

(Kageyama (1993: 261))

In (32a), the VN *ryokoo* is directly followed by *si*. This verbal element cannot be deleted in this construction, as shown by the ungrammaticality of (32b). Mimetics with *suru*, on the other hand, show different behaviors in the construction. For example, the sentence in (33) contains the mimetics *dondon* and *tonton*, both of which are accompanied by forms of *suru* (i.e., *si* and *sita*, respectively).

(33) *Taroo-wa tobira-o dondon*(*si*), *Jiroo-wa tonton sita.*
Taro-TOP door-Acc Mim(do), Jiro-Top Mim do.Past
'Taro thumped at the door and Jiro rapped at an(other) door.'

(cf. Kageyama (1993: 261))

In this sentence, the verb *si* following *dondon* can be deleted. This shows that the mimetic-

suru complex has a different status from the VN-*suru* complex.[20] These examples lead us to conclude that mimetics are not VNs even though they occur in VN positions.

In addition, theoretical problems arise regarding the suffixation analysis. As argued in Chapter 4, derivational morphology exclusively functions to change one category of a given word to another category. Reflecting this function, suffixes generally have a particular subcategorization frame. For example, the nominal suffix *-ment* has the frame [+V__], selecting verbs and changing them into nouns. This means that the inputs to the derivational morphology must have certain categories; otherwise, the subcategorization frame of a suffix fails to be satisfied. In fact, suffixes cannot attach to prefixes, which arguably do not have any categories, as in (34).

(34) *in+ic, *super+ous, *de+ous (Scalise (1984: 75))

Recall here that mimetics "inherently do not have categorial status" (Tsujimura (2005: 144), see also Akita (2009)). In other words, mimetics lack category specifications. As a result, they cannot be inputs to suffixation.

One may argue against the reasoning here based on the data in (35).

(35) a. *toro-mi* Mim-N 'slurry, thickness'

b. *zara-mi* Mim-N 'asperity, a scabrous feeling or quality'

[20] So far, we have demonstrated that the categorial status of mimetic compounds is VN, which predicts that mimetic compounds behave in the same way as VNs like *ryokoo* and *tozan*; they do not tolerate the deletion of *si*, which is attached to the first mimetic compound. This prediction is borne out:

(i) *Taroo-wa kabe-don *(si), Jiroo-wa ago-kui sita.*
Taro-Top wall-Mim (do) Jiro-Top chin-Mim do.Past
'Taro did *kabe-don*, and Joro did ago-kui.'

c. *nuru-mi* Mim-N ‘gook, a slimy feeling or quality’

(Sugioka (2005: 78))

In these examples, the nominal suffix *-mi* is attached to the mimetic words *toro(toro)* ‘slurry,’ *zara(zara)* ‘rough, asperate,’ and *nuru(nuru)* ‘gooey, slimy,’ respectively. The morpheme *-mi* is generally considered a nominal derivational suffix that typically attaches to adjectives (and adjectival nouns). The examples in (35) thus seem to indicate that mimetics can undergo derivation.

Importantly, however, *-mi* is used primarily to change or add meanings rather than to change categories (Sugioka (2005)). In this sense, the attachment of *-mi* is more likely to be compounding than derivation. Sugioka (2005: 79) points out that the suffix *-mi* has the specific meaning of a concrete feeling or sense of some quality. For example, *toro-mi* in (35a) describes a feeling or sense that arises as when one has thickened soup or sauce. In addition, the suffix *-mi* can attach to lexical items regardless of their categories as long as the resultant words can express a certain feeling or sense of the quality of something. For instance, it attaches to bound morphemes in (36) and to nouns in (37), forming nouns of feeling or sensation.

(36) a. *sin-mi* new-N ‘newness’

b. *zi-mi* ground-N ‘somberness’

(37) a. *ningen-mi* human-N ‘humaneness’

b. *sinzitu-mi* truth-N ‘verisimilitude’

c. *genzitu-mi* reality-N ‘reality, a real possibility’

(Sugioka (2005: 78))

These examples indicate that *-mi* attaches to a lexical item independently of categorial specification. Given these facts, we would do better to analyze *-mi* as a lexeme and its attachment as compounding.

In this connection, it is worthwhile pointing out that while *-mi* in (35) is written in *hiragana* (i.e., -み), *-mi* in (36) and (37), where it attaches to Sino-Japanese words, is written in *kanji*, Chinese characters (i.e., -味). Sugioka (2005) regards both cases as examples of the same suffix *-mi*. Importantly, the pronunciation *-mi* is the Sino-Japanese reading (*on-yomi*) of the *kanji* graph 味, which is also read *azi* in the native reading (*kun-yomi*) when it is used as a free word, meaning 'taste.' Nagano and Shimada (2014) argue that a *kanji* graph represents a lexeme and its Sino-Japanese and native readings correspond to its different stems. More precisely, the Sino-Japanese reading corresponds to the bound form of a lexeme and the native reading the free form. Given this analysis, we can regard *-mi* in (36) and (37) as a bound form of the lexeme *azi* (味) 'taste.'[21] That is, *-mi* is not a derivational suffix but a lexeme. This means that the complex words in (36) and (37) are compounds. Since the *hiragana* variant of *-mi* in (35) (-み) is the same morpheme as *-mi* in (36) and (37), the complex words in (35) are also compounds. Therefore, we can conclude that the examples in (35) are not problematic to our analysis.

The above discussion shows, both empirically and theoretically that mimetics cannot solely be verbal nouns through reanalysis or suffixation. Hence, the word-formation processes given in (28) and (29) are untenable; we have to rely on another process to coin mimetic compounds. Note that the unavailability of reanalysis and suffixation does not mean that no morphological processes are applied to mimetics; they can undergo

[21] The bound form *-mi* has slightly different meanings from the free form *azi*. While the free form means 'taste,' the bound form has meanings related not only to the sense of taste but also sight and touch (and probably smell and hearing) and to feelings. In this sense, the bound form *-mi* is more abstract than the free form.

compounding. Unlike suffixation, compounding does not raise the problem of categorial specification because it does not impose categorial restriction on its input elements (cf. Kageyama (1982: 224)). The data in (38) show that mimetics can take part in compounding (see also Tamori and Schourup (1999)).

(38) a. (*Koneko-ga*) [*yotiyoti-aruki*]$_{VN}$ *suru* *sugata-ga* *totemo*
(kitten-Nom) [Mim-walk] do figure-Nom very
kawairasii *desu*.
cute Cop
'The kitten waddling along is very cute.'
(https://www.youtube.com/watch?v=u0BTsF2kQgs)

b. *karesi-kara* *sarete* [*kyun-si*]$_{VN}$ *suru* *itutu-no* *koto*
boyfriend-by be.done Mim-die do five-Gen thing
'five actions of one's boyfriend making one's heart skip a beat'
(http://future-next.com/karesikarakyunsi_koto5/)

In (38a), for example, the mimetic *yotiyoti* is combined with the converted noun *aruki*, forming the compound *yotiyoti-aruki*. Notice that the compound is a VN since it is headed by the VN *aruki*. In fact, *yotiyoti-aruki* is followed by the light verb *suru*. Similarly, in (38b), the mimetic *kyun* combines with *si*, resulting in a VN compound.

It is reasonable to assume that the same morphological processes as (38) are involved in the formation of mimetic compounds. The mimetics in mimetic compounds are combined with the semi-lexical VN *ACTION*, yielding the VN compound [mimetic-*ACTION*]$_{VN}$, which is then combined with a noun. *ACTION* provides us with a morphologically permissible process to form mimetic compounds without creating empirical

or theoretical problems.

6.5. The Structural Status of Mimetic Compounds: Are They Postsyntactic Compounds?

This section addresses the question concerning the structural status of mimetic compounds: Are they formed at the level of Deep Insertion, as assumed so far? In Section 6.3, we proposed that mimetic compounds are formed through the compounding process in which the silent semi-lexical VN *ACTION* is involved. However, one might postulate another possibility of their structure: they could have semantically corresponding sentences as their underlying forms, a possibility that mimetic compounds are formed based on sentences, namely, postsyntactic compounds. Let us take *kabe-don* as an example. As pointed out in Section 6.3, *kabe-don* roughly corresponds, in an intuitive sense, to a sentential form such as (39).

(39) *Kabe-o* *don-to* *suru.*
wall-Acc Mim-Quot do
'Someone bangs the wall.' (= (12a))

This structure would then serve as input to the form *kabe-don*, which is derived by truncating the accusative marker *-o*, the quotative marker *-to*, and the light verb *suru*. This derivational process yields a result similar to what Shibatani and Kageyama (1988) call postsyntactic compounds. For example:

(40) [[*Kanai* *ga* *Amerika* *o* *hoomon*] *no* *ori*] *ni* *wa*,
my.wife Nom America Acc visit Gen occasion on Top

iroiro *osewa* *ni* *narimasita*.

much hospitality Adv.Part she.received

'Thank you for your generous hospitality when my wife visited America.'

(Shibatani and Kageyama (1988: 455))

According to Shibatani and Kageyama, The embedded sentence *kanai ga Amerika o hoomon* can be shortened to result in the following bracketed compound:[22]

(41) *kanai* *ga* [*Amerika*:*hoomon*] *no* *ori*

my.wife Nom America:visit Gen occasion

(Shibatani and Kageyama (1988: 457))

The compound *Amerika:hoomon* is postsyntactic in that it is based on a syntactic, not lexical, input in (40) (':' in (41) indicates that the compound in question is a postsyntactic compound, and is distinguished from '-', which is used here to mark the relevant sequence as a lexical compound).

If mimetic compounds belonged to the class of postsyntactic compounds (e.g. *kabe:don*), the semi-lexical VN *ACTION* would not be required to ensure the semantic relation between the mimetic and the left-hand element, each of which would belong to a different semantic dimension (see Section 6.2.1). This is because such a relationship would already be guaranteed by the light verb *suru* in the underling sentential form; in that case,

[22] Postsyntactic compounds like (41) are severely restricted to embedded positions headed by a noun denoting a certain time relation (Shibatani and Kageyama (1988)), such as *[…] no ori* in (41); syntactic phrases appearing in this environment can become an input to compounds derived at the postsyntactic level. In other words, if *Amerika* and *hoomon*, for example, are combined in a non-embedded environment, the resulting compound is a lexical compound and is completely different from a postsyntactic one; *Amerika-hoomon* is pronounced without pause between the two constituents and no longer preserves the pitch pattern of each constituent.

our proposal revolving around the lexical level would be dismissed. This possibility, however, is not tenable; genuine postsyntactic compounds and mimetic compounds differ in several aspects. In particular, postsyntactic compounds have phrasal characteristics that are rooted in the underlying sentential inputs, whereas such characteristics are not observable in mimetic compounds. In what follows, we will discuss the discrepancies between these two types of compounds, excluding the possibility where mimetic compounds have structural bases in sentential forms, and concluding that they are formed at the lexical level.

Let us begin with the phonological aspects. Mimetic compounds, as already discussed in Section 6.2.1, show compounding phonological patterns. Postsyntactic compounds, on the other hand, are pronounced "with the inherent pitch patterns of the individual members kept intact and a slight pause put after the first member" (Shibatani and Kageyama (1988: 459)); phonologically, they have phrasal status. Thus, the postsyntactic compound *Amerika:hoomon* in b) involves a slight pause immediately after *Amerika* and preserves the underlining pitch pattern of each constituent shown in (36) (*Amerika-hoomon* shows a compound phonological pattern).

(42) a. *Amerika o hoomon no sai* (overline = high pitch)
America Acc visit Gen occasion
'on the occasion of visiting America'

b. [*Amerika:hoomon*] *no sai* [postsyntactic compound]
[America:visit]

(Shibatani and Kageyama (1988: 460))

cf. *Amerika-hoomon* [lexical compound]
America visit

(Shibatani and Kageyama (1988: 459))

A discrepancy between these two types of compounds can also be observed semantically. The semantic relation between the constituents of postsyntactic compounds is contingent on their underlying sentential forms, which strictly restricts their possible interpretations. Shibatani and Kageyama (1988: 470) give the following contrasts between postsyntactic and lexical compounds, showing the difference in various possible interpretations:

(43) Instrumental:

a. *enpitu-gaki* 'writing with a pencil,' *mizu-arai* 'washing with cold water,' *basu-tuugaku* 'going to school by bus'

b. * *densanki:keisan-tyuu / no sai*
computer:calculate
cf. *densanki <u>de</u> keisan-tyuu ni* 'when calculating with a computer'

Source:

a. *gaikoku-gaeri* 'the state of having returned from abroad,' *huro-agari* 'the state of having taken a bath' (lit. 'getting out of a bathtub')

b. * *Amerika:kikoku-go / no sai*
America:homecoming
cf. *Amerika <u>kara</u> kikoku-go / no sai* 'when coming back from America'

'Outer' Location:

a. *iso-zuri* 'fishing near the shore,' *madoguti-watasi* 'handing (goods) at the window,' *Amerika-umare* 'being born in America'

b. * *resutoran:syokuzi-tyuu / no sai*
restaurant:dining
cf. *resutoran <u>de</u> syokuzi-tyuu ni* 'when dining at a restaurant'

Manner:

a. *hitori-aruki* ‘walking alone,’ *naname-yomi* ‘skimming through a book,’ *sinkon-ryokoo* ‘honeymoon’

b. * *abekku:sanpo-tyuu / no sai*
together:walk
cf. *abekku <u>de</u> sanpo-tyuu ni* ‘when taking a walk with one’s girl/boy-friend’

(Shibatani and Kageyama (1988: 470))

As shown in the a-examples, lexical compounds allow a range of semantic relations between the constituents, none of which are available in postsyntactic compounds, as seen in the b-examples. Shibatani and Kageyama conclude that the internal relations of lexical compounds are determined pragmatically, whereas those of postsyntactic compounds “are strictly compositional in precisely the same way as sentences are” (Shibatani and Kageyama (1988: 478)).

Mimetic compounds are similar to lexical compounds, rather than postsyntactic compounds; we can easily find examples where internal relations appear to be determined pragmatically. For example:

(44) a. *atama-don* [instrumental] (= (21b))
head-Mim
‘the act of a man cornering a woman with his head’

b. *koosaten-zukyun* [location]
intersection-Mim
‘an emotional movement that occurs when a person faces another person while waiting for a traffic light at an intersection and they immediately

fall in love.'

(http://www.honda.co.jp/GIORNO/special/giorkyun/)

c. *neko-banban* [beneficiary] (= (4f))

Atama in (44a) and *koosaten* in (44b) respectively have an instrumental relation to *don* and a locative relation to *zukyun*; both of these relations seem to be impossible in the case of postsyntactic compounds. *Neko* in (44c), as discussed, establishes a more peculiar relation to *banban*: *Neko* is a beneficiary of the act of banging the car hood. These facts suggest that mimetic compounds are not coined based on sentential forms.

Mimetic compounds behave differently from postsyntactic compounds with respect to the referentiality of the left-hand element. As illustrated in (45), the left-hand constituent *zikken* of the postsyntactic compound *zikken:syuuryoo* is allowed to be modified by the demonstrative modifier *kono*, showing that it has a referential property (Shibatani and Kageyama (1988)).

(45) [*Kono zikken*]:*syuuryoo-go ni*, *ii* *peepaa* *g*a *kak-e-sooda*.

this experiment:finish-after good paper Nom write-can-seem

'After this experiment is completed, it appears that I can write a good paper.'

(Shibatani and Kageyama (1988: 471))

Shibatani and Kageyama (1988) attribute this property to the sentential origin of postsyntactic compounds, in the sense that their constituents inherit the referentiality of the noun phrases in the syntactic structures. On the other hand, mimetic compounds do not allow modification of the left-hand element by a demonstrative modifier, as illustrated in (46).

(46) * *soko no kabe-don*

that wall-Mim

In sum, mimetic compounds behave differently from postsyntactic compounds. Specifically, unlike postsyntactic compounds, they have no characteristics indicating that they have sentential inputs. It is therefore reasonable to say that mimetic compounds should be regarded as compounds coined at the Deep Insertion level, as assumed thus far.

6.6. Theoretical Implications

So far, we have proposed that mimetic compounds include the semi-lexical verbal noun *ACTION*. This newly identified item will play a role in clarifying the nature of semi-lexical categories. The critical properties of *ACTION* in this context are the following: (i) *ACTION* has the category VN, and (ii) it is a silent element that has no corresponding overt lexical item. The subsequent subsections show what these properties imply concerning semi-lexical categories.

6.6.1. The Types of Semi-lexical Categories and Japanese

The items classified as semi-lexical categories in previous studies have been limited to nouns, verbs, adjectives, and prepositions (cf. Emonds (1985, 2000), Corver and van Riemsdijk (2001b)), and less attention has been paid to other classes. This is inevitable, in a sense, because most previous studies focus mainly on English and other European languages, which lack VNs (cf. Shibatani (1990)). Consequently, it has not been clear whether there are semi-lexical elements that belong to classes other than the four major ones. However, by analyzing Japanese mimetic compounds, we have demonstrated the existence of the semi-lexical verbal noun *ACTION*. This shows that the set of semi-lexical categories

contains not only the four major categories, but also other categories like VN.

Japanese has another category that European languages do not have: adjectival nouns (AN). They behave as adjectives in some respects and as nouns in others. Recall that Chapter 5 argues for the existence of semi-lexical adjectival noun *STATE*. Here, the question arises as to whether this semi-lexical adjectival noun can be also used in word-formation involving mimetics. Our conjecture is that there should be cases in which semi-lexical adjectival nouns are involved. One possible candidate is the following compound:[23]

(47) *kin-pika* gold-Mim 'gaudy'

Kin-pika in (47) is similar to the mimetic compounds we have dealt with in this paper as the mimetic appears in the right-hand position. However, it behaves differently from them. While mimetic compounds can co-occur with the light verb *suru*, *kin-pika* cannot:

(48) * *kin-pika suru*

Rather, the following facts suggest that *kin-pika* is an adjectival noun. According to Kageyama (1982: 217), ANs can be nominalized by the suffix *-sa* '-ness' (e.g., *odayaka-sa* 'gentleness'), and they take the inflectional ending *-na* in prenominal position (e.g., *odayaka-na hito* 'a gentle person'). *Kin-pika* behaves in the same way as ANs:

(49) a. *kin-pika-sa*
gold-Mim-ness
'gaudiness'

[23] Example (47) was pointed out to us by Yoko Sugioka (personal communication).

b. *kin-pika-na* (*ie*)

gold-Mim-Infl (house)

'(the house) which is gaudy'

So, the compound in (47) has a categorial status as AN. It may be possible to assume that the head position is occupied by a silent semi-lexical AN, which provides the compound with the AN status:[24]

(50) [[*kin-pika*] $STATE_{AN}$]

If the assumption here is correct, this type of compounds provide independent evidence for the existence of semi-lexical AN, which we first assume in the analysis of adverbial forms of verbs used as adjectival nouns in Chapter 5.

By examining mimetic compounds in Japanese, we can find that not only the four major syntactic categories but also verbal nouns and adjectival nouns can be semi-lexical elements. In this connection, we need more cross-linguistic examination of semi-lexical categories. Given that some other languages like Korean have VNs, we predict that these languages also bear semi-lexical verbal nouns. Answering these remaining questions will also shed new light on the study of semi-lexical categories.

[24] Unlike the mimetics in the discussed mimetic compounds, the mimetic *pika* does not establish the argument-predicate or the adjunct-predicate relation with the left-hand element *kin*. This is because they are assumed to be an appositional compound that "refers to one entity that is characterized by both members of the compound" (Plag (2003: 146)): *kin-pika* characterizes the entity referred to as gold and shining. This type of compound "could be said to have two semantic heads, neither of them being subordinate to the other" (Plag (2003: 146)). Thus, we temporarily assume that *pika* first combines with *kin*, establishing an equal relation. Then [*kin-pika*] combines with the silent semi-lexical AN.

6.6.2. The Independence of Semi-lexical Categories from Lexical Categories

The existence of *ACTION* has another implication for studying semi-lexical categories. As proposed, *ACTION* is a silent semi-lexical element. What is crucial here is that it does not have an overt (lexical) counterpart. This property has an implication for the independence of semi-lexical categories from lexical categories.

Before proceeding to discuss the implication, let us consider the relationship between semi-lexical categories and lexical categories. Many semi-lexical items identified in previous studies seem to presuppose the existence of lexical counterparts. For example, as exemplified in Chapter 1, the nouns *one*, *thing*, *place*, *time*, and *body* can function both lexically as in (5) and semi-lexically as in (54).

(51) a. every interesting thing
b. some delicious thing
c. some cold place

(Kishimoto (2000: 562))

(52) everything, someone, anybody, noplace (Emonds (1985: 162, 204))

Some may argue that these nouns do not belong to the class of semi-lexical categories, but are merely one usage of regular *lexical* nouns with bleached meanings. In addition, others may consider that semi-lexical items always originate in overt lexical categories.

These arguments and considerations raise the question of whether a semi-lexical category should be established as an independent class from the class of lexical elements in the first place. The existence of *ACTION* and *STATE* provides an answer to this question: We need to assume the semi-lexical category as an independent category. This answer comes from the properties of *ACTION* and *STATE* that they are always silent and do not have

overt lexical counterparts. This means that *ACTION* and *STATE* do not depend on overt lexical categories; they cannot be considered to be one usage of a lexical item but rather stand on their own in semi-lexical categories. If semi-lexical elements originate in lexical elements, we cannot appropriately consider *ACTION* and *STATE*. They can be given a secure place in grammar only by assuming a class of semi-lexical elements, which is independent from overt lexical categories.

The above considerations also provide an answer to a question posed by Harves and Myler (2014). Recall from Chpater 1 that they assume a phonologically null past participle *FAILED*, which licenses the negative polarity item *yet* as in (53).

(53) John has yet FAILED [$_{TP}$ <John> to eat dinner <yet>].

(Harves and Myler (2014: 214))

Likewise, they also assume a silent adjectival predicate in the context of constructions like (54).

(54) John is yet to visit Paris. (Harves and Myler (2014: 233), with modifications)

Harves and Myler (2014) argue that in the case of (54), *yet* is licensed by a silent adjectival predicate, as represented in (55).

(55) John$_i$ is yet$_j$???-ED/-EN [$_{TP}$ <John>$_i$ to visit Paris <yet>$_j$].

(cf. Harver and Myler (2014: 237))

Although Harves and Myler (2014) convincingly prove the existence of such a silent element,

they themselves point out a problem. That is, they have no choice but to represent the silent element by the notation *???-ED/-EN* because they "have not yet been able to find an overt counterpart of such a predicate in English" (Harves and Myler (2014: 237)). After examining one possible candidate, they leave it for future research to identify an overt counterpart of the silent adjectival predicate in (55). However, if we assume the analysis concerning the semi-lexical verbal noun *ACTION* developed above, it is not necessarily the case that an overt counterpart exists.[25] Rather, the lack of such an overt counterpart shows the necessity of assuming semi-lexical categories as categories in their own right. Thus, we can conclude that together with *ACTION*, observed in mimetic compounds, *???-ED/-EN* supports the independence of semi-lexical categories.

6.7. Summary

This chapter has explored the functions of the silent semi-lexical item *ACTION* by examining Japanese mimetic compounds. Mimetic compounds show an apparently peculiar behavior, as they do not seem to follow the RHR and their categorial status is restricted to VN. We have tried to account for this peculiarity by assuming that the silent semi-lexical verbal noun *ACTION* occurs in the head position (e.g., [*kabe* [*don ACTION*]]). *ACTION* mediates the relationship between a mimetic and a prosaic word like *kabe* 'wall' in such a way that *ACTION* makes a mimetic into a full-fledged word that has a syntactic category (i.e., VN) and argument structure. If so, *ACTION* should be inserted at the beginning of the syntactic computation (i.e., the Deep Insertion level). This further indicates that *ACTION*

[25] Harves and Myler (2014) do not refer to the silent adjectival predicate as a semi-lexical element. However, their analysis is in line with studies including Kayne (2005). Thus, given Corver's (2008) characterization of semi-lexical categories, it is safe to consider this predicate as a semi-lexical item. In addition, *???-ED/-EN* is devoid of semantic content and behaves like a functional category as it serves as a grammatical licenser of the negative polarity item *yet*. *???-ED/-EN* thus reflects characteristics of semi-lexical categories.

comes from the Dictionary. In other words, the Dictionary can contain silent semi-lexical items, which arguably originate in the Syntacticon.

We have thus demonstrated the validity of our proposal by showing that alternative analyses where the silent semi-lexical verbal noun *ACTION* is not assumed face empirical and/or theoretical problems. As a result, this chapter provides independent evidence for *ACTION*. Its role found in this chapter can be summarized as follows:

(56) a. $ACTION_{VN}$

b. Combined with mimetic words, this item establishes an argument-predicate relationship between a mimetic and a noun.

c. This item is stored in the Dictionary and undergoes Deep Insertion.

Our proposal deepens our knowledge of semi-lexical categories in two areas. First, verbal nouns and adjectival nouns can fall under semi-lexical categories. Second, "semi-lexical" needs to be established as an independent category from (overt) lexical categories. Along with the semi-lexical categories in the Syntacticon (i.e., grammatical N, V, A, P), which are assumed in Emonds (2000), those in the Dictionary (i.e., heavy affixes and silent elements like *ACTION*) are also essential parts of human language(s).

Chapter 7

Concluding Remarks

It has been recognized that there are elements that display properties of both lexical and functional categories, and these elements have been investigated under the label of semi-lexical categories. Compared to lexical and functional categories, however, semi-lexical categories are less well understood. In light of this, this thesis has examined the following questions within the theoretical framework proposed by Emonds (2000, 2001, 2002, 2005):

(1) a. What lexical items can be classified as semi-lexical categories?

b. What roles do they play in grammar, especially in morphology?

c. What status do they have in the grammar system?

Emonds' framework, the Bifurcated Lexical Model, contains two basic hypotheses. Firstly, the model hypothesizes that the Lexicon consists of two subcomponents, the Dictionary and the Syntacticon. Secondly, the lexical items in the Syntacticon can undergo three processes of lexical insertion occurring at different stages of syntactic computation: Deep Insertion, Syntactic Insertion, and PF Insertion. These hypotheses and the assumptions derived from them accommodate various types of semi-lexical categories in the Lexicon in a systematic way.

Emonds (2000) originally assumed grammatical nouns, verbs, adjectives, and prepositions stored in the Syntacticon and labeled them "semi-lexical" (see also Emonds (2001)). Given the bifurcation of the Lexicon, we can assume another type of "semi-lexical" category, as discussed in Section 2.7: *semi-lexical categories in the Dictionary*. This assumption is quite reasonable when we consider "semi-lexicality" as "secondary

membership" in the lexical component. For example, grammatical N, V, A, and P are not primary members of the Syntacticon. Accordingly, we can assume two strata of lexical items in the Syntacticon as follows:

(2) Syntacticon: an inventory of lexical items without purely semantic features *f*

a. Primary Items: derivational affixes, inflectional affixes, D, I, etc.

b. Secondary Items: grammatical N, V, A, P

If we interpret "semi-lexicality" as "secondary membership" in the lexical component, we can assume such secondary items in another lexical component, namely, the Dictionary. That is, the Dictionary is also composed of the primary members (i.e., N, V, A, P) and secondary members originating in the Syntacticon:

(3) Dictionary: an inventory of lexical items with purely semantic features *f*

a. Primary Items: lexical N, V, A, P

b. Secondary Items: "heavy" affixes

Thus, departing from Emonds' (2000) original assumption of semi-lexical categories, we can assume that semi-lexical categories are symmetrically distributed in the two subcomponents of the Lexicon, as formalized in (5).

(4) Symmetric Existence of Semi-lexical Categories

a. The Syntacticon contains N, V, A, and P that are devoid of purely semantic features *f*.

b. The Dictionary contains lexical items that originate in the Syntacticon and

that are assigned purely semantic features *f*.

This view of semi-lexical categories enables the Lexicon to accommodate various "in-between" lexical items.

Chapters 3 and 4 provide additional evidence that the Syntacticon contains grammatical noun, verbs, and prepositions by detecting several lexical items belonging to this class and showing their behaviors in the Multi-level Lexical Insertion. Examining the morphological prepositional prefixes in English, Chapter 3 identified *out-* with the meaning of 'surpass' as a grammatical preposition. Chapter 4 demonstrated that grammatical nouns have the same status as nominal suffixes in the Syntacticon. They behave in the same way in terms of headedness in the formation of complex words. The findings in these chapters can be summarized as follows:

(5)

	Lexical Items	Roles	Status
P	*out-* 'surpass'	It alternatively realizes the feature complex [MANNER, EVAL, COMPARE, POSITIVE], which occurs in post-verbal position.	It is stored in the Syntacticon and undergoes PF Insertion.
N	*time, process, period*	They function as the head of a complex word whose non-head selects arguments.	They are stored in the Syntacticon and undergo Syntactic Insertion.
V	*-ageru* 'completive,' *-sasu* 'incompletive,' *-komu* 'intensive result,' *-sikiru* 'contiuative,' etc.	They function as the head of V-V complex verbs, adding lexical aspectual meanings to the non-head verbs.	They are stored in the Syntacticon and undergo Syntactic Insertion.
N	*-see* '-made.by, -made.in,' *-gata*/*kata* '-shape, -size,' *-taipu* '-type,' -	They are combined with nouns, forming complex relational nouns with some classificatory functions.	They are stored in the Syntacticon and undergo Syntactic Insertion.

	sutairu '-style,' etc.		

Chapters 5 and 6 are concerned with semi-lexical categories in the Dictionary. Semi-lexical categories in the Dictionary can be classified into two types. First, when Syntacticon items like derivational affixes undergo Deep Insertion, they are changed into lexical categories in the Dictionary. Second, Syntacticon items such as phonologically empty items are entered in the Dictionary to express some meanings in zero form. Chapter 5 argues that these two types of semi-lexical items play an important role in the formation of result nominals. Specifically, suffixed result nominals are headed by the nominal suffix *-ment*, which is turned into a lexical category via Deep Insertion. Meanwhile, converted result nominals are headed by the silent semi-lexical categories *ENTITY*, *KATA*, and *KOTO*, among others. Silent semi-lexical categories originate in the Syntacticon but are stored in the Dictionary. Extending the proposed analysis of converted nouns to adverbial forms of Japanese verbs used as verbal nouns and adjectival nouns, the chapter also proposed the silent semi-lexical categories $ACTION_{VN}$ and $STATE_{AN}$. Their existence in the Dictionary is independently supported by the behavior of mimetic compounds discussed in Chapter 6. In particular, this chapter demonstrates that $ACTION_{VN}$ functions to glue mimetics to major lexical categories, thereby establishing the relationship between them. Crucially, the semi-lexical categories that are exclusively used in silent forms, in other words, those lacking overt counterparts, indicate the independence of semi-lexical categories from overt lexical categories. The findings in Chapters 5 and 6 are summarized in the table in (6).

(6)

	Lexical Items	Roles	Status
N	*-ment*	This item is combined with verbs, forming complex event nominals and result nominals.	This item is stored in the Syntacticon. When it undergoes Syntactic Insertion, complex event nominals are formed; when it undergoes Deep Insertion, result nominals are formed.
N	*ENTITY*, *KATA*, *KOTO*	This item is combined with verbs, forming converted nouns.	This item is stored in the Dictionary and undergoes Deep Insertion.
VN	$ACTION_{VN}$	This item is combined with verbs, forming converted verbal nouns.	These items are stored in the Dictionary and undergo Deep Insertion.
		This item is combined with mimetic words, and establishes an argument-predicate relationship between a mimetic and a noun.	
AN	$STATE_{AN}$	This item is combined with verbs, forming adjectival nouns.	These items are stored in the Dictionary and undergo Deep Insertion.

Importantly, it would be rather difficult to capture the morphological phenomena studied in this thesis without assuming semi-lexical categories. They support the existence of semi-lexical categories, and in addition suggest that they are widely employed in morphology. This further indicates that semi-lexical categories compose a necessary part of human language.

Finally, we turn to areas of future research. This thesis focused on English and Japanese and identified several new semi-lexical items. We need to further explore these languages and examine what types of lexical items can be regarded as semi-lexical categories. In addition, we can examine questions concerning cross-linguistic variation and similarity in semi-lexical elements, including: Do other languages also have the semi-lexical items

identified in this thesis? Do typological characteristics have an effect on the existence or types of semi-lexical categories in a language? Answering these remaining questions will also shed new light on the study of semi-lexical categories, as well as natural languages more generally. I hope that this thesis contributes to exploring the frontiers of research in semi-lexical categories.

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