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A DYNAMIC APPROACH TO PHRASAL COMPOUNDS

A Thesis

Presented to

The Graduate School of Humanities and Sciences

Ochanomizu University

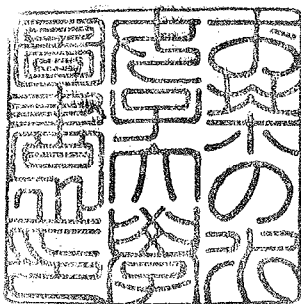
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of Ph.D. in Linguistics

by Chiaki Fujihara-Komatsu

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CHAPTER I

INTRODUCTION

1.1 Lexicon and Morphology

The word is one of the most fundamental units of linguistic structure. Words are the basic building blocks used in forming and understanding larger structural units such as phrases and sentences. Without some knowledge of the words in a given language, neither the production nor the comprehension of sentences would be possible.

It is generally assumed in generative grammar that words are stored in the brain of a native speaker of a language. This storage of words is called the lexicon or mental lexicon. Each word or lexical item listed in the lexicon must include at least three kinds of information: (a) semantic information (meaning), (b) syntactic information (category) and (c) phonological information (pronunciation). The lexical entry for *run*, for instance, is informally illustrated in (1.1).

- (1.1) $\left[\begin{array}{l} \textit{run} \\ \text{(a) semantic information: 'RUN'} \\ \text{(b) syntactic information: the category Verb} \\ \text{(c) phonological information: /r \wedge n/} \end{array} \right]$

In (1.1), the semantic information RUN means to move one's legs at a speed faster than walking.

Words are classified into two categories: simple and complex. A simple word is a minimal unit; it cannot be broken down into any meaningful phonological units. The word *run*, for instance, cannot be broken down into smaller parts. On the other hand, a complex word is made up of two or more parts. The word *runner*, for instance, may be broken down into a simple verb *run* and the *-er* part. The following list of words shows that the *-er* part is attached to verbs to form a noun which denotes the agent of the action expressed by the base verb.

- (1.2) a. work - worker 'the one who works'
- b. swim - swimmer 'the one who swims'
- c. teach - teacher 'the one who teaches'
- d. employ - employer 'the one who employs someone'

The parts that comprise a complex word are called morphemes.

Morphemes are divided into two types: free morphemes and bound morphemes. A free morpheme can stand alone as an independent word in a phrase, such as the word *run*, which is used in *Will you run upstairs?* A simple word is one free morpheme. A bound morpheme cannot stand alone but must be attached to another morpheme. For instance, the bound morpheme *-er* can only occur attached to verbs. One instance of the bound morpheme is an affix. Affixes are divided into three types: prefix, suffix and infix. *Re-* as in *redo*, *rewrite*, *rethink* is an instance of a prefix, and *-er* as in *runner*, *walker* and *swimmer* is an instance of a suffix. The morpheme to which an affix is attached is called the 'base' morpheme.

Like a free morpheme, a bound morpheme has its own lexical entry. (Williams 1981, Selkirk 1982, Di Sciullo and Williams 1987). For instance, the lexical entry for the affix *-er* can be represented as in (1.3).

- (1.3) *-er*
- a. semantic information: denotes the agent of the action
denoted by the base verb
 - b. syntactic information: a suffix forming nouns
from verbs
 - c. phonological information: /əɾ /

Complex words consisting of two or more free morphemes are compounds (e.g. *picture book*, *apple pie*), and those combining a free morpheme and an affix are derived words (e.g. *runner*, *happiness*). A complex word must be memorized as a whole if a part of the complex word is unknown to the speaker/hearer. For instance, consider the word *cranberry*. One of its constituents, *berry*, is familiar, because there are other complex words having *berry* as one of their constituents, but the other one, *cran* is not. Such a word must be stored in the lexicon as a whole for recurrent use. Similarly, a complex word whose meaning is not predictable from the meaning of its constituents must be stored in the lexicon, even if all the constituents of the word may be familiar. For instance, consider the word *redcap*. Even though both *red* and *cap* are familiar words, the meaning of the entire word *redcap* is not straightforwardly determined from the meaning of its constituents.

The kinds of words considered so far are words to be listed in the lexicon. However, it is not the case that all kinds of words must be stored as a whole in the lexicon. For instance, consider the word *walked*. The constituents of the word are familiar: *walk* and *-ed*, and its meaning is predictable from the meaning of its constituents. There is no need for this word to be listed in the lexicon. Given the lexical entries for *walk* and *-ed*, this word is generated by a rule. Rules for forming complex words are called morphological processes, and it is generally assumed that they constitute a component of the grammar called "morphology."

Morphological processes may create entirely new, non-established words which are not conventionally used in a speech community. This often happens when speakers want to convey a new meaning which deserves to be named, but which cannot be expressed by any established word. These novel words may be used only on one occasion (nonce use) or often used in a speech community in a given language and eventually conventionalized and added to the lexicon.

In relation to the distinction between lexicon and morphology, a distinction is often made between actual words and possible (or potential) words. An actual word is an attested word with which most of the speech community is familiar. A possible word, on the other hand, is a word which is not actually used by someone but which is morphologically well-formed and can be used in a given language.

In general, morphological processes are divided into derivational processes (rules that form a new word out of existing words, like *breakable* and *organ transplant*), and inflectional processes (rules that specify a

grammatical form of words such as the past tense form of a verb and the plural form of a noun). The major classes of derivation attested in natural language include compounding, affixation, conversion, and reduplication. Different options are favored in forming novel words in different languages. Germanic languages such as English, German, and Dutch often use compounding in forming novel words, while Romance languages such as French and Spanish do not use this option.

Given the cross-linguistic variation in morphological processes, the question arises as to how children acquire morphological processes possible in a given language. The basic tenet of generative grammar is that a human being is genetically endowed with some linguistic knowledge, which constitutes the language faculty in the brain. Chomsky (1957, 1965, 1975, 1981, 1986, 1995) identifies it as Universal Grammar. What is innate does not have to be learned; language acquisition consists of learning language-particular properties of the target language guided by Universal Grammar. The questions that have to be asked of morphological studies in the framework of generative grammar are thus the following:

- (1.4) a. What kinds of regularities observed in morphological processes are universal?
- b. What kinds of regularities observed in morphological processes are particular to a given language?
- c. How do children acquire these language-particular properties of morphological processes?

In this study, I would like to examine the properties of compounds and the way they are acquired.

1.2 Word and Phrase

As pointed out by Di Sciullo and Williams 1987, linguistic theory defines a hierarchy of linguistic units where each unit has the "composes" relation with the following one as in (1.5) (morphemes compose words, and words compose compounds, and so on).

(1.5) morpheme > word > compound > phrase > sentence

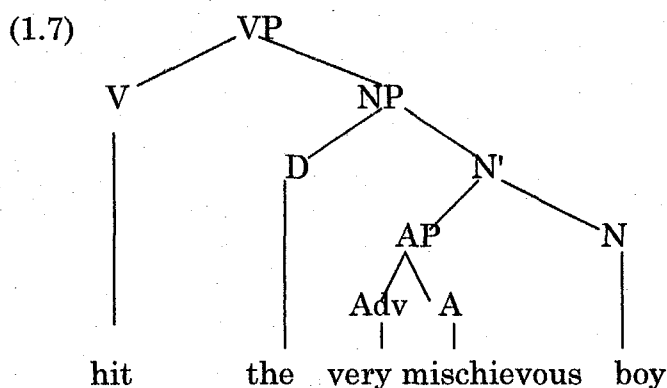
Di Sciullo and Williams assume that there is a dichotomy in the hierarchy of units --- with morphemes, words and compounds on one side (the words) and phrases and sentences on the other (the phrases). Words and phrases are generated by different types of rules. Rules for forming the structure of words constitute morphology, while rules for forming the structures of phrases constitute another component of the grammar, which is called syntax. In what follows, I will review some of the general assumptions concerning word structures and phrase structures upon which this study is based.

1.2.1 Phrase Structure

Phrases are not just unstructured sequences of words. Rather, they have a hierarchical constituent structure in which words are grouped together into phrases. Each constituent (a word or a phrase) in a phrase

belongs to a syntactic category. For instance, the phrase in (1.6) has a hierarchical structure which is represented in terms of a labeled tree diagram such as (1.7) (Abbreviations: VP = verb phrase, V = verb, NP = noun phrase, D = determiner, AP = adjective phrase, N = noun, Adv = adverb, A = adjective).

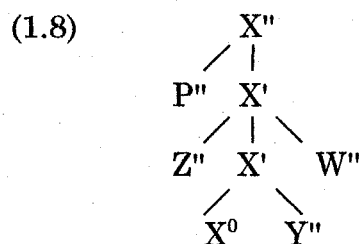
(1.6) hit the very mischievous boy



In (1.7), *boy* is a word-level category which is a noun, and *the very mischievous boy* is a phrase-level category which is a noun phrase. Similarly, *hit* is a word-level category which is a verb, and *hit the very mischievous boy* is a phrase-level category which is a verb phrase. The syntactic category of the phrase *the mischievous boy* is determined by the noun *boy*, and the syntactic category of the verb phrase *hit the mischievous boy* is determined by the verb *hit*. We may say that the noun *boy* is the head of the phrase *the mischievous boy* and that the verb *hit* is the head of the phrase *hit the mischievous boy*.

The structure of a phrase is defined by a phrase structure rule or a rewriting rule of the following format: X ---> Y (e.g. VP ---> V NP). Studies

on phrase structure rules over the past few decades have made it clear that a variety of phrases such as a noun phrase, a verb phrase, an adjective phrase and a prepositional phrase share common properties. All phrases consist of a word-level category (the head) and some phrase-level categories (the non-heads). In order to capture the generalization across phrase structure rules, X-bar theory has been proposed (cf. Chomsky 1970, 1986, Jackendoff 1977, Stowell 1981)¹. X-bar theory specifies that all phrases have one and only one head. This is implemented in a phrase structure grammar by saying that all possible phrase structure rules are universally of the form: $X^n \rightarrow \dots X^{n-1} \dots$. This means that phrases in general have endocentric structures. It follows from X-bar theory that phrase structures have the general schema below in (1.8), where X, Y, Z, W and P stand for variables ranging over the types of syntactic categories.



In (1.8), X^0 is the head of the phrase. X' and X'' are called projections of this head. In this study, I assume that there are at maximum two bar levels, so that X'' represents a maximal projection. For the sake of

¹ Recent studies on phrase structures have argued that X-bar theory is not a primitive principle (cf. Kayne 1994, Chomsky 1995). Whether X-bar theory is a primitive principle or not does not affect the argument in this study.

convenience, I will usually replace X" by XP. The sister of X⁰(Y") is the complement of X⁰. The sister of X' (Z" or W") is a modifier or an adjunct of X⁰. The sister of the topmost X' (P") is the specifier of X⁰.

While it is assumed that the hierarchical structure of a phrase in (1.8) is universal, the relative order of constituents with respect to the head of the projection is subject to cross-linguistic variation. In English, for instance, the head nouns, adjectives, verbs and prepositions italicized in (1.9) generally precede their bracketed complements.

- (1.9) a. *destruction* [of the city]
b. *knowledgeable* [about flowers]
c. *ate* [an apple]
d. *from* [the box]

In Japanese, on the other hand, nouns, adjectives, verbs and postpositions² all follow their heads as seen from (1.10) (GEN = genitive case marker, DAT = dative case marker, ACC = accusative case marker, PAST = past tense morpheme).

- (1.10) a. [mati no] *hakai*
city GEN destruction

² Postpositions are the Japanese counterpart of prepositions in English. The difference between prepositions and postpositions lies in the relative order between the head and the non-head.

- b. [hana ni] *kuwasi-i*
flower DAT knowledgeable
- c. [ringo o] *tabe-ta*
apple ACC eat-PAST
- d. [hako] *kara*
box from

1.2.2 Word Structure

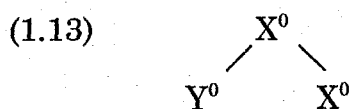
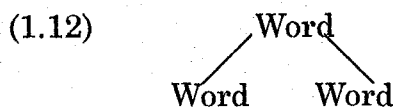
Words, as well as phrases, have a hierarchical constituent structure. This suggests that there must be some kind of word formation rules which generate those structures.

Selkirk (1982) and Di Sciullo and Williams (1987) claim that word formation rules are rewriting rules analogous to the phrase structure rules found in syntax. I will refer to the rewriting rules for words as word structure rules. Word structure rules specify the possible combinations of morphemes which constitute words in the same way that phrase structure rules in syntax specify the possible combinations of words and phrases which constitute phrases. Specifically, Selkirk (1982) proposes that English has the following word structure rules (where 'root' means monomorphemic nonaffix morpheme such as the italicized parts of the words *conclus-ive* and *de-ceive*, and is a lower level category than a word).

- (1.11) a. root ---> affix root
- b. root ---> root affix
- c. word ---> word affix

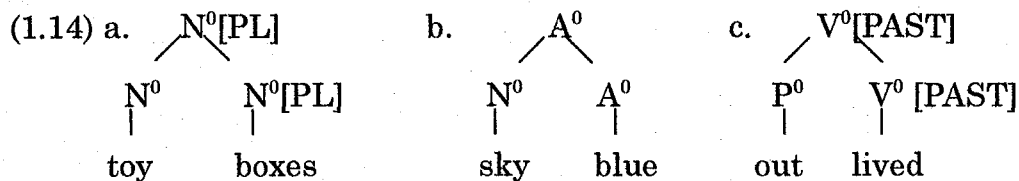
- d. word ---> affix word
- e. word ---> word word

Given (1.11e), compounds in English have the general structure in (1.12). This structure may be represented as in (1.13), where X and Y are variables ranging over types of syntactic categories.



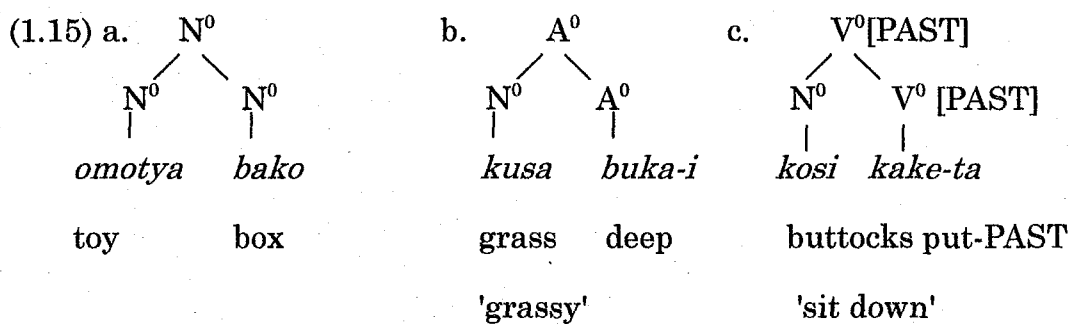
Selkirk (1982) and Di Sciullo and Williams (1987) assume that words, as well as phrases, have heads. Compounds in English are, in many cases, endocentric³ and normally have the head on the right. The head of a word determines the category and inflectional properties (such as tense, number and so on) of the entire word. The compounds in (1.14) are typical examples of endocentric compounds in English, with the head on the right ([PL] stands for plural number feature, and [PAST] stands for past tense feature).

³ All possible phrases have a head. However, compounds need not always contain a head. Some compounds such as *lazy-bones* and *pickpocket* do not contain an element which functions as the semantic head. *Lazy-bones* is not a type of bone, and *pickpocket* is not a type of pocket. Such compounds are called exocentric compounds. The meaning of an exocentric compound is not predictable from the meaning of its constituents. I assume that those compounds are simply listed in the lexicon and are not generated by any rule in morphology.



The compound in (1.14a) is a compound noun, the compound in (1.14b) is a compound adjective, and the compound in (1.14c) is a compound verb.

In Japanese, as well as in English, compounds are, in many cases, endocentric and the head of a word is generally identified as the rightmost element of the word. The compounds in (1.15) are typical examples of endocentric compounds in Japanese. In these examples, the rightmost element determines the syntactic categories or inflectional properties of the entire compound.



While word structures are analogous to phrase structures, there are some fundamental differences between them. One of the differences lies in how to determine the head of a structure (cf. Di Sciullo and Williams (1987:23)). In phrase structures, the head of a phrase is identified as an X^0 projection of the same syntactic category as its dominating category. In word structures, on the other hand, the head of a word is identified by its

position in linear order; the head of a word is identified as the rightmost element or leftmost element in the word.

Second, in word structures, we do not find a cross-categorial generalization analogous to the generalization expressed by X-bar theory for phrase structures. X-bar theory tells us that words belonging to different syntactic categories such as N, A, V, and P uniformly project to maximal projections (NP, AP, VP, PP) with the same hierarchical structure. In compounds, however, not all words belonging to different syntactic categories uniformly constitute compounds. In English, for instance, we often find compounds consisting of two nouns (N+N) and compounds consisting of a noun and an adjective (N+A), but we cannot find either compounds consisting of a noun and a preposition (N+P) or compounds consisting of a noun and a verb (N+V). Thus, the general schema above in (1.13) is inadequate to describe the possible types of compounds in English. On the basis of these facts, Selkirk suggests that a grammar of a particular language must have compound-specific rules formulated in terms of syntactic categories such as $N \rightarrow NN$, and $A \rightarrow NA$.

A further difference between word structures and phrase structures is that of productivity. By the term 'productivity,' I mean the extent to which a particular structure is likely to be used in the production of new expressions in the language. Phrase structures are fully productive; each structure can be used to form an infinite number of phrases. With respect to word structures, however, some structures are regularly and actively used in forming new words (productive), while others have become out of use with the passage of time, and are only used in restricted circumstances (semi-

productive) or are manifested by very few actual words (non-productive). An example of this is given by compound types in English. In English, compound nouns are productive, and compound adjectives are less productive than compound nouns but much more productive than compound verbs and compound prepositions, which are non-productive. The above fact suggests that there is a distinction between rule-based compounds (compounds formed from rules in morphology) and non-rule-based compounds (compounds which are listed in the lexicon). I assume that productive or semi-productive compounds are rule-based, while non-productive compounds are not rule-based and are simply listed in the lexicon.

1.3 Compounds

So far, we have reviewed the general assumptions concerning phrase structures and word structures. In this section, I will look at the descriptive properties of compounds.

1.3.1 Properties of Compounds

There are several properties which differentiate compounds from phrases. In this subsection, I will look at each of these properties in turn.

1.3.1.1 Non-Compositionality

Compounds are, in many cases, semantically non-compositional. For instance, consider English compounds like *honeymoon*, *egghead*, and *greenhouse*. *Honeymoon* denotes 'a holiday taken by a man and a woman

who have just got married,' *egghead* denotes 'a person who is more interested in ideas and theories than in practical actions,' and *greenhouse* denotes 'a glass building in which someone grow plants that need to be protected from bad weather.' We see that the meaning of each compound is not straightforwardly determined from the meaning of its constituents. On the other hand, phrases are generally semantically compositional. While the compound noun *greenhouse* denotes a kind of building used for vegetation, the corresponding noun phrase *green house* denotes 'a house which is green.'

Japanese, as well as English, has a lot of compounds which are semantically non-compositional. In Japanese, for instance, we find compounds like *saru-mata* 'monkey thigh (=underpants for men),' *isi-atama* 'stone head (=a very obstinate person), " and *ama-zake* "sweet liquor (=sweet alcoholic drink made from fermented rice.'

1.3.1.2 Non-Specificity

Another property of compounds which differentiates them from phrases is that of non-specificity. The constituents of a compound are interpreted as having generic reference, not specific reference. For instance, in the verb phrase *to hunt foxes*, the noun *foxes* may have either specific reference or generic reference. The noun denotes either particular specimens of the class 'fox,' or the class 'fox' generally without specific reference to a particular set of foxes. In the compound *fox-hunting*, on the other hand, the noun *fox* is not interpreted as having specific reference, and does not refer to a particular fox or a particular set of foxes.

This type of non-specificity is also observed in Japanese compounds.

For instance, in the compound *kitune-gari*, which is the Japanese counterpart of English *fox-hunting*, the constituent noun *kitune* 'fox' is not interpreted as having specific reference. The noun does not serve to pick out any specific fox.

1.3.1.3 Phonological Unity

Compounds also phonologically differ from phrases. In many languages, compounds and phrases have different phonological patterns.

In stress-accent languages such as English, compounds and phrases have different stress patterns. Compounds in English, in general, have primary stress on the first or leftmost sonority peak in the structure, as in *TOYboxes* and *FOX-hunting* (where the capital letter indicates the position of the primary stress). Phrases in English, on the other hand, have primary stress on the final or rightmost sonority peak in the structure, as in *small BOXES* and *hunt FOXES*. (cf. Chomsky and Halle 1968, Liberman and Sproat 1992)

In pitch-accent languages such as Japanese, compounds are distinguished from phrases in their pitch patterns. Every Japanese word has a sequence of one or more high-pitched moras. This high-pitched sequence may be preceded or followed by low-pitched moras, provided that there is exactly one sequence of high-pitched moras. Thus, we find pitch patterns as in (1.16) (Tokyo Dialect), where the position of the high-pitched mora is indicated by the capital letter.

- (1.16) a. *SOra* 'sky'
 b. *kaWA* 'river'
 c. *koKOro* 'heart'
 d. *oTOKO* 'man'

However, we never find a word which has more than one sequence of high-pitched moras separated by a low-pitched mora as in **KOkoro*, or a word with no high-pitched mora as in **sora* or **kokoro*. The same pitch patterns are observed in compounds but not in phrases. In compounds, two constituent words, each of which has its own high-pitched mora in isolation, are pronounced with one sequence of high-pitched moras (cf. Shibatani and Kageyama (1988:459)) as in (1.17).

- (1.17) a. *DEnki + kaISHA* ----> *deNKI-GAisya*
 electricity company 'electric company'
 b. *yaMA + noBORI* ---> *yaMA-NObori*
 mountain climbing 'mountain climbing'
 c. *KAigai + ryoKOO* --- > *kaIGAI-RYOkoo*
 overseas travel 'overseas tour'

In phrases, on the other hand, each constituent word retains its own high-pitched moras, as in *DEnki-no kaISHA* 'company for electricity' or *yaMA-ni noBORU* 'climb a mountain'.

Japanese compounds may also undergo a phonological process called "sequential voicing" or "Rendaku." This process is roughly described as the

word-initial consonant of the second word of a compound becoming voiced. When the second word of a compound begins with a vowel followed by a consonant, this process does not apply to the compound (cf. Otsu 1980, Ito and Mester 1986). The examples in (1.18) indicate that the noun *hako* 'box' becomes voiced when it appears as the second word of a compound.

- (1.18) a. *gomi + hako* ---> *gomi-bako* 'trash can'
b. *houseki + hako* ---> *houseki-bako* 'jewelry box'
c. *omotya + hako* ---> *omotya-bako* 'toy box'

1.3.1.4 Morphological Integrity

Finally, compounds, unlike phrases, do not allow any syntactic elements to be inserted between the constituents; compounds have morphological integrity as a word unit. For instance, the English compound *toybox* does not allow any phrasal modifier such as *quite large* to be inserted between the constituents, as in **toy quite large box*.

Morphological integrity is also observed in Japanese compounds. In the Japanese compound *omotya bako* 'toy box', for instance, phrasal modifiers such as *totemo ooki-i* 'very big' cannot be inserted between the constituents as in **omotya totemo ooki-i bako*.

So far, we have seen the properties of compounds. These semantic, phonological and morphological properties may be used as criteria for distinguishing compounds from phrases. In this study, I will use these criteria, which are summarized in (1.19), in order to determine whether a given structure is a compound or not. With respect to 'non-compositionality'

in (1.19)(a)(i), however, it is applicable only to compounds stored in the lexicon.

(1.19) a. Semantic Criteria:

- (i) The meaning of a compound is not straightforwardly determined from the meaning of its constituents (Non-Compositionality).
- (ii) The constituents of a compound are interpreted as generic, not as specific (Non-Specificity).

b. Phonological Criterion: Compounds undergo their own phonological processes distinct from that of phrases (Phonological Unity).

c. Morphological Criterion: Compounds make up a word unit which cannot be analyzed by syntactic means (Morphological Integrity).

1.3.2 Types of Compounds

We have already seen that compounds are divided into several types with respect to the syntactic categories to which they belong: compound nouns, compound adjectives, compound verbs, and so on. There are two other ways of classification for compounds, upon which the discussion in this study is based. I will look at each type of classification in 1.3.2.1 and 1.3.2.2.

1.3.2.1 Root Compounds vs. Synthetic Compounds

Compounds may be either primary or synthetic. A primary compound is a compound consisting of simple words, as in *sugar cane*, *bathroom*, *dump truck*. A synthetic compound is a compound whose head is a deverbal word, a word derived from a verb, as in *truck driver*, *can opener*, and *letter-writing*. In synthetic compounds, the non-head constituent is interpreted as a syntactic argument of the base verb of the head. By the term "argument" I mean an element bearing a thematic relation such as Agent, Theme, Goal, Source, Instrument, etc., to the head. In *truck driver*, for instance, *truck* is interpreted as the Theme of *drive*. The compound *truck driver* is analogous in its argument structure to the corresponding verb phrase *drive a truck*⁴.

1.3.2.2 Ordinary Compounds vs. Phrasal Compounds

Selkirk (1982) claims that in morphology, lower level categories cannot dominate higher level categories⁵. This means that root-level categories cannot dominate word-level categories. It also denies the existence of words which contain phrases. For instance, in an expression *a [[used-car]*

⁴ While it is commonly assumed that there is a difference between root compounds and synthetic compounds, there is disagreement as to what constitutes synthetic compounds. Everyone agrees that synthetic compounds include compounds formed from an *-er* nominal like *truck driver*, and compounds formed from gerunds and present participles like *truck driving*. Some linguists such as Selkirk (1982) include compounds formed from other derived nominals (e.g. *slum clearance*, *troop deployment*, *property appraisal*, and so on) and compounds formed from passive participles (e.g. *hand-carried*) as types of synthetic compounds, but others (cf. Fabb (1984)) do not. Selkirk also claims that compound adjectives such as *machine-readable* are also interpreted as synthetic compounds. For further discussion on synthetic compounds, see Roeper and Siegel (1978), Selkirk (1982) and Fabb (1984).

⁵ In syntax, lower level categories may dominate the higher level categories. For instance, *V'* may dominate NP as in (1.7).

salesman], a modifying element, *used-car* is a compound word. However, an expression such as *a [[*slightly-used-car*] *salesman*] is not considered well-formed because the modifying element *slightly-used-car* contains the phrase *slightly used*.

However, it has often been pointed out in the morphological literature that there are cases where compounds containing a phrase as a constituent become possible (cf. Botha (1980), Lieber (1988/1992)). Lieber (1992) among others argues that in expressions such as (1.20), the bracketed phrases combine with the following noun to form compounds. These are called phrasal compounds. In contrast, compounds consisting only of words are called ordinary compounds.

- (1.20) a. a [floor of a bird cage] taste
b. [over the fence] gossip
c. an [ate too much] headache
d. a [who's the boss] wink
e. a [connect the dots] puzzle (Lieber 1992:11)

Phrasal compounds share characteristic properties with ordinary compounds. First, the constituents of phrasal compounds cannot be interpreted as having specific reference (cf. Shimamura 1986). For instance, in the expression *the save-the-whales campaign*, the noun phrase contained in the modifying element, *the whales*, is not interpreted as having specific reference and does not refer to a specific set of whales. Second, phrasal compounds display a stress pattern characteristic of ordinary compounds (cf.

Lieber 1992, Kubozono 1995). The expression *the save-the-whale campaign*, for instance, has primary stress not on the head noun but on the phrasal constituent, as in *the save-the-WHALES campaign*. Third, phrasal compounds have morphological integrity. The expression *the save-the-whale campaign*, for instance, does not allow any syntactic element such as an adjective to be inserted between the constituents as in **the save-the-whale, big campaign*.

It is generally assumed that phrasal compounds are 'marked' expressions and more or less belong to the periphery of grammar. This is indicated by the fact that phrasal compounds are, in general, less acceptable than ordinary compounds, and that the judgement of acceptability varies depending on individuals, or the judgement of acceptability by the same individual fluctuates depending on the occasion.

In order to demonstrate the above, Carroll (1979) conducted an experiment in which subjects were asked to read scenarios like those listed in Table 1-1 below and then judge the acceptability of the final sentence of the scenarios by using a five point scale (A rating of five was perfectly acceptable and a rating of one totally unacceptable). Each scenario presents two entities by means of descriptions at first. In the final sentence, one of the entities is expressed by means of a compound noun.

Table 1-1 *Experimental scenarios*

- (i) There are two dolls. One is a girl and one is a boy. Please give me the *girl doll*.

- (ii) There are two dolls. One is a little girl and one is a big girl. Please give me the *little girl doll*.
- (iii) There are two dolls. One is a girl with a bike and one is a girl with a jump-rope. Please give me the *girl with a bike doll*.
- (iv) There are two dolls. One is a girl with her sled and one is a girl with her skates. Please give me the *girl with her sled doll*.
- (v) There are two dolls. One is a girl playing guitar and one is a girl playing flute. Please give me the *girl playing guitar doll*.
- (vi) There are two dolls. One is a girl braiding her hair and one is a girl combing her hair. Please give me the *girl braiding her hair doll*.
- (vii) There are two dolls. One is a girl that says 'Mama' and one is a girl that says 'Dada.' Please give me the *girl that says 'Mama' doll*.
- (viii) There are two dolls. One is a girl that irons her clothes and one is a girl that cooks her supper. Please give me the *girl that irons her clothes doll*.
- (ix) There are two dolls. One wets when the string is pulled and the other cries when the string is pulled. Please give me the *girl that wets when the string is pulled doll*.
- (x) There are two dolls. One speaks when you squeeze her and the other sings when you squeeze her. Please give me the *girl that speaks when you squeeze her doll*.

(Carroll 1979:865)

Scenario (i) presents an ordinary compound, [[*girl*][*doll*]]. Scenario (ii) presents a phrasal compound whose non-head position is occupied by a noun modified by an adjective, [[*little girl*][*doll*]]. Scenarios (iii) and (iv) present a phrasal compound whose non-head position is occupied by a noun with a prepositional phrase, [[*girl with a bike*][*doll*]] and [[*girl with her sled*][*doll*]]. Scenarios (v) and (vi) present a phrasal compound which contains a noun with a participial phrase, [[*girl playing guitar*][*doll*]] and [[*girl braiding her hair*][*doll*]]. Scenarios (vii) and (viii) present a phrasal compound which contains a noun modified by a relative clause, [[*girl that says 'Mama'*][*doll*]] and [[*girl that irons her clothes*] [*doll*]]. Scenarios (ix) and (x) present a phrasal compound which contains a noun modified by a relative clause that itself embeds an adverbial phrase, [[*girl that wets when the string is pulled*][*doll*]] and [[*girl that speaks when you squeeze her doll*]]. Phrasal compounds in Scenarios (iv), (vi), (viii) and (x) include an anaphoric expression.

According to the result of this experiment, the most acceptable compound is an ordinary compound *girl doll* in (i), which is judged significantly better than all the others. The item in (ii) is judged next best, and judged significantly better than the remaining eight forms, and the items in (iii) and (iv) are judged significantly better than the remaining four forms. The items in (v) and (vi) are judged as acceptable as phrasal compounds in (ix) and (x).

In order to examine whether the judgement of acceptability changes after the subjects have been exposed to all the experimental items, Carroll conducted a second experiment, after finishing the first experiment. In the

second experiment, the subjects were presented with the same scenarios again and asked to judge the final sentence of each scenario. On the second experiment, subjects came to see the experimental items as less different with respect to acceptability. The items in (i) and (ii) did not differ. The items in (ii) and (vii) did not differ, either, and nor did any of the remaining items differ from one another.

While phrasal compounds are considered to be marked expressions, they are attested in many languages including English, German, Dutch, Afrikaans, and Japanese. In Japanese, for instance, we can find examples as in (1.21)⁶, where the bracketed phrases combine with the following noun to form a compound.

- (1.21) a. [*sumai no oteire*] *kyousitu*
 house GEN maintenance lecture
 'a lecture on the maintenance of a house'
- b. [*umi, fune, minato no syasin*] *kontesuto*
 sea, ship, harbor GEN picture contest
 'a contest for pictures of sea, ships and harbors'

In Japanese, as well as in English, phrasal compounds display properties characteristic of ordinary compounds. First, the constituents of phrasal compounds cannot be interpreted as having specific reference. For instance, in (1.21b), the noun phrase *umi, fune, minato no syasin* does not refer to any specific picture. Second, phrasal compounds display a pitch-pattern

⁶ Both of the examples in (1.21) are cited from a newspaper article.

characteristic of ordinary compounds as shown in (1.22). In (1.22), the last element of the bracketed phrasal modifier and the following noun are pronounced with one sequence of high-pitched moras.

(1.22) [*SU*mai no *oTEIRE*] *KYQ*usitu

Third, phrasal compounds have morphological integrity as shown by the fact that no syntactic elements can be inserted between the constituents as in (1.23).

(1.23) **sumai no oteire* *syufu-muke no* *kyousitu*
house GEN maintenance housewife-intended-for GEN lecture
'a lecture for the maintenance of a house intended for
housewives'

1.4 Aim and Scope of the Present Study

While many studies have been made on ordinary compounds, phrasal compounds have generally been neglected as something exceptional and of lesser importance. However, we cannot discard these compounds simply as exceptional, because they are observed in many languages. In this study, I will examine the properties of phrasal compounds and attempt to explain their properties, along with the following facts concerning phrasal compounds:

- (1.24) (i) Phrasal compounds share properties with ordinary compounds in a given language.
- (ii) Phrasal compounds are more marked than ordinary compounds.
- (iii) Phrasal compounds are attested in many languages.

In Chapters II and III, I will examine the properties of phrasal compounds in English and in Japanese, and will consider the similarities and differences between the two languages.

In Chapter IV, in order to examine whether the properties of phrasal compounds can be explained in the frameworks that have already been proposed, I will review three major theoretically different approaches to word formation: (A) the lexicalist approach (Selkirk (1982), Di Sciullo and Williams (1987)), (B) the syntactic approach (Lieber 1992), and (C) the modular approach (Shibatani and Kageyama (1988)). Under each of these approaches, various analyses of phrasal compounds have been proposed. However, I will argue that none of the previous analyses can adequately describe or explain the properties of phrasal compounds. These analyses all assume a Chomskyan generative framework, which defines the notion of possible grammar without reference to any grammar at the non-final stage of language acquisition. In so far as we direct our attention only to the characteristics of adult grammar, we will not be able to explain the properties of phrasal compounds, or those of various phenomena discussed in Chapter V.

In Chapter V, I will propose an alternative analysis of phrasal

compounds within the Dynamic Theories of Language (DTL), which have been developed in Kajita (1977, 1997). The basic tenet of DTL is that the grammars of the non-final stages of language acquisition play an important role in explaining the uniformity and diversity of the final stage of grammars and the course of language development. Specifically, I propose that phrasal compounds are derived from ordinary compounds through the extension of the types of possible items in the non-head positions. I will show that the alternative analysis can not only explain the properties of phrasal compounds but also give a principled and unified account of various phenomena concerning language acquisition and cross-linguistic variation.

CHAPTER II

PHRASAL COMPOUNDS IN ENGLISH

In this chapter, I will examine the properties of phrasal compounds in English. Before examining the properties of phrasal compounds, I would like to review the properties of ordinary compounds in 2.1.

2.1 Ordinary Compounds

2.1.1 Syntactic Categories of Words Constituting Ordinary Compounds

As we have seen in Chapter I, word structure rules generating compounds are represented by using syntactic categories. For instance, a rule generating compound nouns like $[[school]_N[bus]_N]_N$ and $[[toy]_N[box]_N]_N$ is represented as in $N \rightarrow N \ N$.

Syntactic categories are, in general, divided into two types: lexical categories and functional categories. Lexical categories in English include nouns (N), adjectives (A), verbs (V) and prepositions (P), and functional categories include determiners, pronouns, auxiliaries, and complementizers. The italicized words in (2.1a-d) are typical examples of words belonging to functional categories.

(2.1) a. determiners

a book, *the* book, *this* book, *that* book

b. pronouns

I like you, and *she* loves *him*.

c. auxiliaries

I *will/can/must/should* read the book.

d. complementizers

I think *that* you are honest.

I doubt *if* you are honest.

Words belonging to lexical categories may constitute compounds, while words belonging to functional categories may not. Functional categories are used only in forming phrases.

Among lexical categories, words belonging to N, A and V may take various inflectional forms. Those inflectional forms may appear in the head position of a compound, but they cannot, in general, appear in the non-head position. In what follows, I will look at the inflectional properties of each of the above categories, and will show that only a stem form of a word may appear in the non-head position of a compound.

2.1.1.1 Nouns

Nouns are generally divided into two subclasses: proper nouns and common nouns. In English, common nouns are further classified into countable nouns and uncountable nouns. Countable nouns inflect for number, and have distinct singular and plural forms as shown in pairs such as *dog/dogs*, *box/boxes*, and *man/men* in (2.2). Each word has an uninflected base form or stem form (*dog*, *box* and *man*). The singular form is the same as the stem form of a word, and the plural form is formed by adding the plural affix *-(e)s* to the stem (*dogs* and *boxes*) or changing the

phonological form of the stem (*men*).

(2.2)	STEM	singular	plural
a.	dog	<i>dog</i>	<i>dogs</i>
b.	box	<i>box</i>	<i>boxes</i>
c.	man	<i>man</i>	<i>men</i>

Compound nouns, as well as simple nouns, may inflect for number, and have singular and plural forms. When compound nouns consisting of two nouns such as *bulldog*, *toybox*, *workman* are pluralized, only the head nouns take a plural form as in *bulldogs*, *toyboxes* and *workmen*. The non-head nouns, in general, cannot take a plural form as in **bulldog*, **toys box* and **works man*¹.

2.1.1.2 Adjectives

English adjectives may be classified into two types: gradable adjectives and non-gradable adjectives. Gradable adjectives, in many cases, have three inflectional forms: the absolute, comparative, and superlative forms. Supposing that the absolute form is the same as the stem form of a word, the comparative and superlative forms are formed by adding the inflectional affixes *-er* and *-est* to the stem form of the word or by changing the phonological form of the word, as illustrated in (2.3) with the adjectives *dark*

¹ As is pointed out by Selkirk (1982), there are cases where the non-head nouns have the plural form as in *programs coordinator* and *parks commissioner*. These compounds are allowed only under certain restricted conditions.

and *good*.

(2.3) STEM	absolute	comparative	superlative
dark	<i>dark</i>	<i>darker</i>	<i>darkest</i>
good	<i>good</i>	<i>better</i>	<i>best</i>

When an adjective appears in the non-head position of a compound as in [[*dark*]_A-[*room*]_N], it takes the stem form of a word and cannot take either the comparative or the superlative forms as in **darker-room* and **darkest-room* (cf. Kageyama 1997:59)².

2.1.1.3 Verbs

English verbs inflect for tense (present and past), person (1st, 2nd and 3rd person (psn)) and number (singular (sg) and plural (pl)). They take three inflectional forms, as illustrated in (2.4) with the verbs *exploit* and *feed*.

² However, compound adjectives like *nice-looking* and *good-hearted* have inflectional forms like *nicer-looking* and *better-hearted*. In these compounds, the non-head adjectives *nice* and *good* inflect and have the comparative forms *nicer* and *better*.

(2.4)

STEM	past	present			
		1st psn	2nd psn	3rd psn	
				pl	sg
exploit	<i>exploited</i>	<i>exploit</i>			<i>exploits</i>
feed	<i>fed</i>	<i>feed</i>			<i>feeds</i>

When compound verbs inflect for tense, person and number, the head verbs take the appropriate inflectional form. In compound verbs such as *under-exploit* and *over-feed*, for instance, the head verbs inflect for tense as in *under-exploits/under exploited* and *over-feeds/overfed*.

Verbs may appear in the non-head position of a compound noun as in [[*rattle*]_V [*snake*]_N]_N and [[*swear*]_V [*word*]_N]_N. In these compounds, the non-head verb is the stem form of a word and cannot take any inflectional forms as in **rattles-snake/ *rattled-snake* and **swears-word/ *swore-word*.

2.1.2 Possible Types of Ordinary Compounds

Having seen the properties of words which may constitute compounds, let us next look at the possible combinations of the lexical categories (N, A, V and P) of words constituting compounds. Given the four lexical categories, there are sixteen logically possible combinations of the categories of words which constitute compounds like (A)-(P) in Table 2-1. Actual

attested examples are listed in Table 2-1³. Compound types whose examples are not attested are indicated by a slash.

As we see from (A)-(D) in Table 2-1, a compound noun may consist of N, A, P and V, followed by N. A compound adjective may consist of N, A, and P on the left, and A on the right, as shown in (E)-(G), but compound adjectives whose left-hand member is a verb, V+A, do not exist in English as indicated by the slash in (H). With respect to compound prepositions and compound verbs, their non-head positions may be occupied by only P as shown in (I)-(P).

Table 2-1

(A) N + N	(B) A + N	(C) P + N	(D) V + N
meat ball party frock shopping list	high chair blackboard blueprint	down trend underpass	swearword rattlesnake
(E) N + A	(F) A + A	(G) P + A	(H) V + A
sky blue girl crazy class conscious	icy cold bright pink dark blue	over-explicit under-ripe	/
(I) N + P	(J) A + P	(K) P + P	(L) V + P
/	/	into out of	/
(M) N + V	(N) A + V	(O) P + V	(P) V + V
/	/	overfeed under-exploit	/

Selkirk (1982) claims that compounds of types (A)-(G) and (O) are

³ Examples are cited from Selkirk (1982), Spencer (1991), and Akmajian, Demers, Farmer and Harnish (1995).

generated by the following word structure rules⁴.

(2.5) a. N ---> N N

b. N ---> A N

c. N ---> P N

d. N ---> V N

(2.6) a. A ---> N A

b. A ---> A A

c. A ---> P A

(2.7) V ---> P V

The rules in (2.5a-d) generate the structures of compound nouns as in (A)-(D), the rules in (2.6a-c) generate the structures of compound adjectives as in (E)-(G), and the rule in (2.7) generates the structure of compound verbs as in (O).

Since a word structure rule of the form $N \rightarrow N N$ is recursive, it is predicted that an N+N compound may form a part of another N+N compound. This prediction is borne out by examples like (2.8a-c). The N+N compounds *bathroom* and *towel rack* may be combined together to form another N+N compound, (2.8a), which may be combined with a noun to form another N+N compound, (2.8b), which may be further combined with a noun to form yet another N+N compound, (2.8c).

⁴ Selkirk (1982) does not take into account compound prepositions as in (K) in Table 2-1, and hence does not assume a rule like $P \rightarrow P P$.

- (2.8) a. [[[bath]_N [room]_N]_N [[towel]_N [rack]_N]_N]_N
 b. [[[[bath]_N [room]_N]_N [[towel]_N [rack]_N]_N]_N [designer]_N]_N
 c. [[[[[bath]_N [room]_N]_N [[towel]_N [rack]_N]_N]_N [designer]_N]_N
 [training]_N]_N

(Selkirk 1982:15)

If all of the possible compound types in Table 2-1 are generated by word structure rules of the form $X \rightarrow Y \ X$, it is predicted that they all exhibit the same possibilities of recursion as observed with N+N compounds. Selkirk (1982) argues that this prediction is borne out with respect to compound adjectives and compound verbs, pointing out that examples like (2.9a-c) are possible in English.

- (2.9) a. [[collision]_N [[shatter]_N [proof]_A]_A]_A
 b. [[[hard]_A [boiled]_A]_A [seeming]_A]_A
 c. ? [[over]_P [[back]_P [track]_V]_V]_V

In (2.9a), an N+A compound *shatter-proof* forms a part of a larger N+A compound *collision shatter-proof*, in (2.9b) an A+A compound *hard-boiled* forms a part of a larger A+A compound *hard-boiled seeming*, and in (2.9c), a P+V compound *backtrack* forms a part of a larger P+V compound *overbacktrack*.

However, compound nouns of types (B)-(D) (A+N, P+N, V+N) do not exhibit recursion. For instance, an A+N compound $[[black]_A[board]_N]_N$ cannot form a part of a larger A+N compound as in $*[[thin]_A [[black]_A$

[*board*]_N]N, a P+N compound [[*down*]_P [*trend*]_N]N cannot form a part of a larger P+N compound as in *[[*over*]_P [[*down*]_P [*trend*]_N]N], and a V+N compound [[*rattle*]_V [*snake*]_N]N cannot form a part of a larger V+N compound as in *[[*bite*]_V [[*rattle*]_V [*snake*]_N]N]. Similarly, compound adjectives of type (G) (P+A) do not exhibit recursion either. A P+A compound [[*under*]_P [*ripe*]_A]A, for instance, cannot constitute another P+A compound as in *[[*under*]_P [[*under*]_P [*ripe*]_A]A].

Given the assumption that word structure rules for compounds are recursive, along with the fact that compounds of the forms N+N, N+A, A+A, and P+V exhibit recursion, while compounds of the forms A+N, P+N, V+N, P+N do not, we are led to the conclusion that English grammar contains only the following word structure rules.

- (2.10) a. N ---> N N
 b. A ---> N A
 c. A ---> A A
 d. V ---> P V

Word structure rules of the form X --> Y X are capable of generating not only self-embedding compounds like (2.8) and (2.9), but also an infinite number of novel compounds. Given that English grammar contains the set of word structure rules in (2.10), it is predicted that compounds of the forms N+N, N+A, A+A and P+V are productively used in forming novel words. In fact, N+N, N+A and A+A compounds are regularly and actively used in forming novel words in English. With respect to P+V compounds, however,

only a small number of prepositions (*over, out, under, off, up*) occur in these compounds, while many others (*in, at, on, from, to*) do not. This suggests that it is inadequate to formulate a rule for compound verbs by using a syntactic category, P, and rather that rules generating compound verbs must be formulated by using lexical items, as in $V \rightarrow \textit{under V}$, $V \rightarrow \textit{over V}$, and so on.

On the other hand, given that English grammar does not contain word structure rules generating compounds of the forms A+N, P+N, V+N, P+A, and P+P, it is predicted that these kinds of compounds are not productive and are rarely used in forming new words in English. In fact, V+N and P+P compounds are not productive and are manifested by only a small number of actual compounds. Although A+N compounds are manifested by a relatively large number of actual compounds, adjectives in the non-head position, in many cases, denote COLOR (e.g. *blue print, redbird*), SHAPE (e.g. *round dance, square dance*) and DIMENSION (e.g. *longboat, big tree*) and adjectives which denote QUALITY like *pretty, beautiful*, and *ugly* rarely constitute compound nouns.⁵ With respect to P+N and P+A compounds, only a small number of prepositions (e.g. *under, over, up* and *above*) occur in these compounds, and many others (e.g. *at, from, of*) do not.

Thus, we may say that among the word structure rules for English

⁵ Expressions of the form A+N, in many cases, do not exhibit compound stress. For instance, in expressions like *blue alert, red clover, round trip, square bracket, long vacation* and *big toe*, both of the two constituents have the primary stress. A+N expressions which have compound stress are, in many cases, exocentric compounds like *blue blood, red breast, round heel, square leg, longneck*, and *big wig*.

compounds postulated by Selkirk (1982), only N ---> N N, A ---> N A and A ---> A A exist in English grammar. Bearing in mind the discussion in this section, let us turn now to the properties of phrasal compounds in the following section.

2.2 Phrasal Compounds

In English, we can find examples like (2.11), which consist of a phrasal category XP, shown in italics, followed by a noun⁶.

- (2.11) a. the [*save-the-whales* campaign]
b. his usual [*why-don't-you-try-a-little-harder* lecture]
c. [*inside-the-park* homerun]
d. the [*spitting-on-soldiers* stories]
e. an [*ate-too-much* headache]

The italicized elements of these examples are considered to be phrasal categories (XPs) for the following reasons. First, they contain syntactic elements which generally cannot appear within compounds. For instance, they contain words belonging to functional categories such as a determiner like *the* in (2.11a) and (2.11c), an auxiliary verb like *don't* in (2.11b), and a pronoun like *you* in (2.11b). They also contain inflectional forms of words such as a plural noun like *soldiers* in (2.11d) and the past tense form of a verb like *ate* in (2.11e). Second, the italicized elements in (2.11) all have

⁶ The example in (2.11e) is given by Lieber (1992:11). The example in (2.11d) is cited from Bob Green (1987) *Homecoming*, p.167.

primary stress on the rightmost constituent in the structure, as in *save-the-WHALES*, *why-don't-you-try-a-little-HARDER*, *inside-the-PARK*, *spitting-on-SOLDIERS*, and *ate-too-MUCH*.

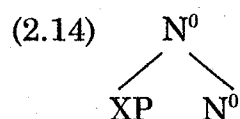
While the italicized elements in (2.11) are analyzed as XP, the bracketed entire structures are considered to be compound nouns, rather than noun phrases, since they display properties characteristic of ordinary compounds. First, the nominal constituents appearing in these structures cannot be interpreted as having specific reference. For instance, expressions like *the whales* in (2.11a) and *soldiers* in (2.11d) do not refer to any specific whale or soldiers. Second, the bracketed structures in (2.11) have compound stress as in (2.12). In (2.12), we see that primary stress falls not on the head noun but on the phrasal non-head.

- (2.12) a. the *save-the-WHALES* campaign
- b. his usual *why-don't-you-try-a-little-HARDER* lecture
- c. *inside-the-PARK* homerun
- d. the *spitting-on-SOLDIERS* stories
- e. an *ate-too-MUCH* headache

Third, the bracketed structures in (2.11) have morphological integrity as shown by the fact that no syntactic elements such as adjectives can be inserted between the constituents as in (2.13).

- (2.13) a. *the save-the-whales, big campaign
 b. *his usual why-don't-you-try-a-little-harder, long lecture
 c. *inside-the-park, wonderful homerun
 d. *the spitting-on-soldiers, shameful stories
 e. *an ate-too-much, terrible headache

Thus, the bracketed structures in (2.11) can be analyzed as compounds containing XPs in their non-head positions. I assume that the internal structure of a compound noun like (2.11) is represented as in (2.14)⁷.



In what follows, I will look more closely at the properties of phrasal compounds. I will first examine the internal structure of phrases which may appear in the non-head position in 2.2.1, and next look at the possible categories of words which may appear in the head position in 2.2.2.

⁷ The elements in (i) consist of a noun phrase on the left and a noun on the right, but they display properties characteristic of phrases, rather than compounds (cf. Burstein (1992), Kato and Kageyama (1998)).

- (i) a. top-of-the-line printer
 b. state-of-the-art computer

They have the primary stress on the head noun as in (ii), and allow some syntactic elements to be inserted between the constituents as in (iii).

- (ii) a. top-of-the-line **PRINTER**
 b. state-of-the-art **COMPUTER**
 (iii) a. That is a top-of-the-line speedy printer.
 b. That is a state-of-art expensive computer.

The analysis of these expressions is beyond the scope of this study.

2.2.1 The Non-Head

As we see from the examples in (2.15)-(2.18), a noun phrase (NP), an adjective phrase (AP), a verb phrase (VP), and a prepositional phrase (PP) may appear in the non-head position of a phrasal compound. (Abbreviations in square brackets indicate the source from which an example is cited. The sources of data that I use in this study are listed on the page 130, along with their abbreviations.)

(2.15) Noun Phrase

- a. The drawbacks inherent in the methodology employed in the universal-typological [['many languages']_{NP}[approach]_N]_N are many. < Hall:47>
- b. The depth of analysis of particular languages that is called for here is usually obtainable only given a [['limited languages']_{NP}[approach]_N]_N (such as Chomsky's); ... < ibid.>
- c. "He'll say, 'I lost control so I had to shut her up,' " said Ms. Coker, who has written about the [[crime-of-passion]_{NP}[defense]_N]_N. < NYTWR '94/7/16>
- d. ?There are two dolls. One is a girl playing guitar and one is a girl flute. Please give me the [[girl playing guitar]_{NP}[doll]_N]_N.
- e. ?There are two dolls. One is a girl that says 'Mama' and one is a girl that says 'Dada'. Please give me the [[girl that says 'Mama']_N[doll]_N]_N. (Carroll 1979:865)

- f. The revulsion over the Los Angeles riots helped the election of Mayor Rihard Riordan, a self-described [[law-and-order]_{NP} [politician]_N]_N and the first Republican to hold that office in a generation. <NYTWR '93/10/24>

(2.16) Adjective Phrase

- a. In the mayoral race in New York, there are tensions over whether the [[tough-on-crime]_{AP}[stance]_N]_{AP} of Rudolph W. Giuliani, the Republican challenging Mayor David N. Dinkins, is a subtle appeal to prejudice. <NYTWR '93/10/24>
- b. ..., most others have taken the alternative position that outbound anaphora is ungrammatical, and only occasionally ameliorated through contextual manipulations. In the following section, we reject this [['ungrammatical-but-salvageable']_{AP}[view]_A]_A of outbound anaphora, and present our pragmatic analysis of the phenomenon. <WSM:1991>

(2.17) Verb Phrase

- a. an [[eat-lunch-in-parks]_{VP} [campaign]_N]_N
- b. an [[ate-too-much]_{VP} [headache]_N]_N (Lieber 1992:11)

(2.18) Prepositional Phrase

- a. an [[inside-the-park][homerun]]
- b. [[out-of-Parliament][speech]] (Jespersen 1922:344)

Phrasal compounds in (2.15a-e) contain nouns modified by a quantifier, a past participle, a prepositional phrase, a present participial phrase and a

relative clause, and a conjoined noun phrase, respectively.⁸ Phrasal compounds in (2.16a,b) contain an adjective with a prepositional phrase and a conjoined adjective phrase, respectively. Phrasal compounds in (2.17a-c) contain a verb phrase with its object and an adverbial phrase. Phrasal compounds in (2.18a-e) contain prepositional phrases.

Furthermore, the examples below in (2.19) indicate that sentences (IP or CP) may constitute phrasal compounds. In (2.19a-d), the non-head position of a compound is occupied by a declarative sentence (2.19a), an interrogative sentence (2.19b), an exclamative sentence (2.19c) and an imperative sentence (2.19c).

- (2.19) a. his usual [[women-are-dangerous] [remark]]
- b. his usual [[why-don't-you-try-a-little-harder] [lecture]]
- c. his usual [[Oh-what-a-wonderful-world-this-is] [remark]]
- d. the [[save-the-whales] [campaign]]

However, it is not the case that any type of phrase can freely appear in the non-head position of a phrasal compound. The internal structure of phrases forming a part of a phrasal compound are restricted in the following points. First, nouns with demonstratives (e.g. *this*, *these*, *that*) or deictic pronouns (e.g. *that*, *them*, *her*) cannot appear in the non-head position of a phrasal compound as shown in (2.20) and (2.21) (cf. Mithun (1984),

⁸ I could not find actually used examples of phrasal compounds which contain nouns modified by a participial phrase as in (2.15d) and a relative clause as in (2.15e). According to Carroll (1979), these examples are less acceptable.

Shimamura (1986)).

- (2.20) a. *the save-*this*-whale campaign
b. *the spitting-on-*these-soldiers* stories
c. *inside-*that*-park homerun
- (2.21) a. *the save-*that* campaign
b. *the spitting-on-*them* stories
c. *inside-*her*-park homerun

Second, adjectives with a degree word such as *so*, *too* and *that* cannot combine with the following noun to form a compound noun. Although such an adjective phrase may combine with a head noun as in (2.22), the resultant constituent is always taken not as a compound noun but as a noun phrase. The examples in (2.22) display characteristic properties of phrases; they have primary stress on the head noun as in (2.23), and allow some syntactic element to be inserted between the constituents as in (2.24).

- (2.22) a. it recalled that [[so-different] [time]] when ..

(Jespersen 1922:336)

- b. Brown hunched forward on the [[too-comfortable] [sofa]].

(Yagi 1987:13)

- c. her [[too-simple-to-be-true] [dress]] (Quirk et al. 1985:1336)

- (2.23) a. so-different TIME

- b. the too-comfortable SOFA

- c. her too-simple-to-be-TRUE dress

- (2.24)a. so-different old time
- b. the too-comfortable leather sofa
- c. her too-simple-to-be-true strange dress

Third, although IP and CP may constitute a phrasal compound, they are restricted to compounds with quotative properties (cf. Jespersen 1922, Burstein 1992, Fujihara 1995, Wiese 1996). For expository convenience, I will refer to IP and CP forming a part of phrasal compounds as a prenominal sentential constituent, PSC. The reason why these elements are considered to be quotative is that they share properties with a quote in a quote structure as in (2.25b). First, neither PSC nor a quote cannot be introduced by the complementizer *that* as shown in (2.25a) and (2.25b). This contrasts with the case of a reported clause. A reported clause may be introduced by the complementizer as in (2.25c).

- (2.25)a. the (*that-)women-are-dangerous belief (PSC)
- b. John said, "(*That) women are dangerous." (quote)
- c. John said (that) women are dangerous. (reported clause)

Second, first or second person pronouns appearing inside PSC do not necessarily refer to the utterer or addressee of the whole sentence. For instance, the first person pronoun in the PSC in (2.26a) refers to *John*, not to the utterer of the whole sentence. The same is true of the quote in (2.26b), in contrast with the reported clause in (2.26c). In (2.26b), *I* refers to the subject of the main clause *John*, while in (2.26c), *I* refers to the

utterer of the whole sentence.

- (2.26) a. The I-never-loved-her-anyway defense occurred to John.
b. John said, " I never loved her anyway."
c. John said that I never loved her anyway.

Third, the inversion of a subject and an auxiliary is observed in PSC, as well as in a quote, as shown in (2.27a-b). The inversion of a subject and an auxiliary is not allowed in a reported clause as in (2.27c).

- (2.27) a. his usual why-don't-you-try-a-little-harder lecture
b. John wondered, "Why did Mary kiss me ?"
c. John wondered why Mary kissed him.

It must be noted here that elements with quotative properties are not restricted to clauses; any meaningful element can be quoted. Even a part of a phrase like the italicized elements in (2.28a) or an expression of a foreign language like the Chinese phrase in (2.28b) can be quoted⁹.

⁹ The example in (2.28a) is cited from the text of Chomsky (1981) (p. 164). *If-then* and *if-and-only-if* are each quoted from the definitions of "government" as the following.

- (i) [$\beta \dots \gamma \dots \alpha \dots \gamma$], where
a. $\alpha = X^0$
b. where ϕ is a maximal projection, if ϕ dominates γ then ϕ dominates α
c. α is an immediate constituent of β
(ii) [$\beta \dots \gamma \dots \alpha \dots \gamma$], where
a. $\alpha = X^0$

(2.28) a. A variant of definition (4)-(5), proposed by Dominique Sportiche and Youssef Aoun, strengthens the *if-then* in (4ii) to *if-and-only-if* and deletes (iii).

b. The sign reads, " Jiang huayu."

' Speak Mandarin (Chinese)'

As pointed out by Wiese (1996), these elements can appear in the non-head position of a compound as in (2.29)¹⁰.

(2.29) a. if-and-only-if expression

b. jiang-huayu campaign

'speak-Mandarin ' campaign

Thus, we can say that quote expressions can be used in a compound-internal position, and that PSC is merely a special case.

In sum, we may say that the following constraints are imposed on the internal structure of phrases forming a part of phrasal compounds.¹¹

(2.30) a. Phrases containing demonstratives or deictics cannot constitute phrasal compounds.

b. where ϕ is a maximal projection, ϕ dominates α if and only if ϕ dominates γ

¹⁰ I will take up the analysis of Wiese (1996) later in Chapter IV.

¹¹ The points in (2.30a) and (2.30b) have already been discussed in Fujihara (1995a), (1995b) and Komatsu (1998).

- b. Phrases containing degree words cannot constitute phrasal compounds.
- c. CP and IP constituting phrasal compounds are restricted to CPs and IPs with quotative properties.

2.2.2 The Head

The phrasal compounds considered so far consist of various kinds of phrasal categories, followed by a simple noun. I will consider whether the other types of categories may appear in the head position of a phrasal compound, and if so, what types of categories may constitute phrasal compounds.

The example in (2.31) indicates that a deverbal noun like *owner*, *chaser* and *inspector* may combine with a phrasal category to form a synthetic compound noun. We can say that a deverbal noun may be used as the head of a phrasal compound.

- (2.31) a. [[big-dog]_{NP} [owner]_N]
 b. [[skinny-girl]_{NP} [chaser]_N]
 c. [[home-for-the-aged]_{NP} [inspector]_N] (Carroll 1979:863)

An adjective may also combine with a phrasal category to form a compound adjective. For instance, the examples in (2.32) indicate that a simple adjective like *gray* and *cozy* may be the head of a phrasal compound, and the examples in (2.33) indicate that a deverbal adjective like *sounding*, *acting* and *looking* may be the head of a phrasal compound.

- (2.32) a. a pair of [[cloudy-sky]_{NP} [gray]_A]_A pants
 b. The place was [[cold-weather]_{NP} [cozy]_A]_A.
- (2.33) a. a [[hard-to-spell]_{AP} [sounding]_A]_A name
 b. [[tough-to-please]_{AP} [acting]_A]_A boss (a-b: Nanni 1980:578)
 c. the [[heavier-than-usual]_{AP} [looking]_A]_A mail load
- (Morita 1985:49)

However, it is impossible to form a phrasal compound by adjoining a phrasal category to a verb or a preposition. We cannot find phrasal compounds which contain a noun phrase on the left and a verb or a preposition on the right as in (2.34a-b).

- (2.34) a. *[[Charles and Di]_{NP} watch]_V
 b. *[[competition of the month]_{NP} in]_P (Lieber 1988:210)

Recall here that words belonging to the categories 'noun' and 'adjective' productively form ordinary compounds, while words belonging to the category 'preposition' do not. With respect to words belonging to the category 'verb', they can combine with only a small number of prepositions to form ordinary compounds¹². Considering the fact that categories of

¹² It is pointed out in Kajita (1999a) that while many novel compound verbs are used in the novel *American Tabloid* written by James Ellroy. Examples are:

- (i) Drivers watched from the sidewalk --- Jimmy roundhoused the window and *glass-blasted* them.
- (ii) You *print-wiped* every surface before you checked out.
- (iii) The OD man *spasm-kicked* the windshield out.

words which may constitute phrasal compounds are restricted to nouns and adjectives, along with the fact that only these two categories can productively form ordinary compounds in English, we are led to the following conclusion:

- (2.35) Only categories of words which productively form ordinary compounds may constitute phrasal compounds.

2.3 Summary

In this chapter, I have examined the properties of phrasal compounds in English. We have seen that while phrasal compounds may contain various types of phrases (NP, AP, VP, PP, IP and CP) in the non-head positions, these non-head phrases are restricted in the following points: (i) they cannot include either demonstratives or deictics; (ii) they cannot include degree words; and (iii) among CP and IP, only phrases with quotative properties may be used as the non-head phrases. With respect to the head position, we have seen that among categories of words which constitute ordinary compounds (N, A, V, and P), only categories of words which productively form ordinary compounds, N and A, may constitute phrasal compounds.

According to Kajita (1999b), however, none of phrasal compounds with a verb head is not used in this novel.

CHAPTER III

PHRASAL COMPOUNDS IN JAPANESE

In this chapter, I will examine the properties of phrasal compounds in Japanese, and consider the similarities and differences between Japanese and English. Before doing so, I would like to review the properties of ordinary compounds in Japanese.

3.1 Ordinary Compounds

3.1.1 Syntactic Categories of Words Constituting Ordinary Compounds

Lexical categories in Japanese include nouns, adjectives, verbs and postpositions. In addition to these categories, Japanese also has two lexical categories which are not found in English: adjectival nouns and verbal nouns. In this subsection, I will look at the properties of each of these categories and show that, like in English, only the stem form of a word may appear in the non-head position of a compound.

3.1.1.1 Nouns

Japanese nouns, unlike English nouns, do not inflect. The singular and plural distinction observed in English nouns is not generally found in Japanese nouns. In Japanese, nouns do not take inflectional affixes like the English plural affix *-(e)s*. Although Japanese has the plural marker *-tati*, it can be attached only to animate nouns like *kodomo-tati* 'children' and *ningen-tati* 'humans,' and cannot be attached to inanimate nouns as in **isu-*

tati 'chairs' **ie-tati* 'houses,'

Japanese nouns, in general, take a case particle¹. Japanese has four kinds of case particles: Nominative (NOM) *ga*, Accusative (ACC) *o*, Dative (DAT) *ni*, and Genitive (GEN) *no*. Examples are given in (3.1) below.

(3.1) a. *Taroo ga nai-ta.*

Taro NOM cry-PAST

'Taro cried.'

b. *Taroo ga Hanako o tatai-ta*

Taro NOM Hanako-ACC hit-PAST.

'Taro hit Hanako.'

c. *Taroo ga Hanako ni hon o age-ta.*

Taro NOM Hanako-DAT book-ACC give-PAST

'Taro gave a book to Hanako.'

d. *Taroo no okaasan ga okot-ta.*

Taro GEN mother NOM get-angry-PAST.

'Taro's mother got angry.'

The nominative case particle *ga* is attached to a noun appearing in the subject position of a sentence as in (3.1a-d). The accusative case particle *o* is taken by a noun functioning as the direct object of a sentence as in (3.1b, c). The dative case particle *ni* indicates that the preceding noun is an indirect

¹ It might be said that the case particles in Japanese are inflectional affixes and that Japanese nouns inflect for case. Whether the case particles in Japanese are inflectional affixes or not relies upon the definition of the term 'inflection'. I leave this issue open.

object of a sentence as in (3.1c). The genitive case particle *no* is attached to a noun modifying another noun as in (3.1d).

Nouns in Japanese take the copular *da* when they function as the predicate of a sentence. For instance, a noun like *kodomo* 'child' takes the copular *da* when it appears in the predicate position of a sentence as in (3.2) (where TOP stands for the topic marker, COP stands for the copular, and PRES stands for the present tense)².

- (3.2) *Kanojo wa mada kodomo da*
She TOP still child COP-PRES 'She is still a child.'

The three kinds of elements seen above (the plural marker *-tati*, case particles, and the copular *da*) are all syntactic elements used only in forming phrases, and cannot appear in compound-internal position. Only the stem form of a word like *kodomo* 'child' may appear in the non-head position of a compound as in $[[kodomo]_N[fuku]_N]_N$ 'child clothes'. A noun appearing in the non-head position of a compound cannot take the plural marker *tati* as in $*[[kodomo-tati][fuku]]_N$ 'children clothes.' Similarly, the non-head noun of a compound cannot take any case particles as in $*[[kodomo-ga][fuku]]_N$, $*[[kodomo-o][fuku]]_N$, and $*[[kodomo-ni][fuku]]_N$. It is also impossible to form compounds whose non-head noun takes the copular *da* as in $*[[kodomo-da][fuku]]_N$.

A noun modifying another noun may take the genitive case particle *no*

² The copular *da* inflects for tense and has the present tense *da* and past tense *da-tta* forms.

like $[[kodomono][fuku]]_{NP}$ 'child-GEN clothes,' but such an expression is considered to be not a compound noun but a noun phrase. The following shows that while an expression like $[[kodomono][fuku]]_N$ is a compound, an expression like $[[kodomono-no][fuku]]_{NP}$ is a phrase. First, $[[kodomono][fuku]]_N$ exhibits a pitch pattern characteristic of a compound and is pronounced with one sequence of high-pitched moras as in *koDOMO-fuku*, but $[[kodomono-no][fuku]]_{NP}$ does not exhibit such a pitch pattern, and is pronounced with two sequences of high-pitched moras separated by a low-pitched mora as in *koDOMO-no fuKU*. Second, $[[kodomono][fuku]]_{NP}$ does not allow a syntactic element like *kawai-i* 'pretty-INFL' to be inserted between the constituents as in **kodomono kawai-i fuku*, but $[[kodomono-no][fuku]]_{NP}$ allows it to be inserted between the constituents as in *kodomono-no kawai-i fuku*. Furthermore, $[[kodomono-no][fuku]]_{NP}$ has a slightly different meaning from $[[kodomono][fuku]]_N$. The former denotes 'clothes of a child,' and the latter denotes 'clothes intended for children.' While $[[kodomono][fuku]]_N$ are restricted to clothes intended for children, $[[kodomono-no][fuku]]_{NP}$ may be clothes intended for adults.

3.1.1.2 Adjectives

Japanese adjectives do not have inflectional forms which express the notion of comparison, such as the absolute, comparative, and superlative forms of a word as observed in English. In Japanese, the notion of comparison is expressed by attaching degree adverbs such as *motto* 'more' and *mottomo* 'the most' to an adjective as in *motto utukusi-i* 'more beautiful' and *mottomo utukusi-i* 'the most beautiful'.

However, Japanese adjectives inflect for tense, and have present and past tense forms. For instance, the stem form of a word which denotes 'blue' in Japanese is *ao* and it takes the present tense form *ao-i* and past tense form *ao-katta*, as illustrated in (3.3).

(3.3)	STEM	present	past
	<i>ao</i>	<i>ao-i</i>	<i>ao-katta</i>
	'blue'	'it is blue'	'it was blue'

These inflectional forms of a word cannot be used in a compound-internal position. Only the stem form of a word like *ao* 'blue' may appear in the non-head position of a compound as in $[[ao]_A[zakana]]_N$ 'blue fish.'

An adjective modifying a noun may take the inflectional affix *-i* like $[[ao-i][sakana]]_{NP}$ 'blue-INFL fish', but such an expression is considered to be not a compound noun but a noun phrase. The following shows that while the expression $[[ao][zakana]]_N$ is a compound, the expression $[[ao-i][sakana]]_{NP}$ is a phrase. First, $[[ao][zakana]]_N$ is pronounced with one sequence of high-pitched moras as in *aO-ZAkana*, but $[[ao-i][sakana]]_{NP}$ is pronounced with two sequences of high-pitched moras separated by low-pitched moras as in *aO-i saKANA*. Second, in $[[ao][zakana]]_N$, the word-initial consonant of the head word *sakana* has become voiced, changing from /s/ to /z/ because of the application of the Rule of Rendaku, but in $[[ao-i][sakana]]_{NP}$, the word-initial consonant of the head word *sakana* remains voiceless, and cannot be voiced like **ao-i zakana*. Third, $[[ao][zakana]]_N$ does not allow a syntactic element like *oisi-i* 'delicious-INFL' to be inserted

between the constituents as in **ao oisi-i zakana*, but $[[ao-i][sakana]]_{NP}$ allows such expressions to be inserted between the constituents as in *ao-i oisi-i sakana*. Furthermore, $[[ao-i][sakana]]_{NP}$ has a different meaning from $[[ao][zakana]]_N$. The former denotes 'fish that is blue,' while the latter refers to a certain group of fish including mackerel, horse mackerel, sardine and saury. $[[ao-i][sakana]]_{NP}$ does not necessarily refer to these kinds of fish.

3.1.1.3 Verbs

Japanese verbs do not inflect for person and number, but they inflect for tense, and have present and past tense forms. For instance, the stem form of a word which denotes 'eat' in Japanese is *tabe*, and it takes the present tense form *tabe-ru* and the past tense form *tabe-ta*, as illustrated in (3.4).

(3.4)	STEM	present	past
	<i>tabe</i>	<i>tabe-ru</i>	<i>tabe-ta</i>
	'eat'	'eat(s)'	'ate'

In a compound-internal position, however, a verb cannot take either the present or past tense forms. Only the stem form of a word like *tabe* may appear in the non-head position of a compound as in $[[tabe]_V[mono]_N]_N$ 'eat thing (=food).'

A verb modifying a noun may take an inflectional form like $[[tabe-ta]_V[mono]_N]_{NP}$ 'eat-PAST thing', but such an expression is considered to be not

a compound noun but a noun phrase for the following reasons. First, while $[[tabe][mono]]_N$ is pronounced with one sequence of high-pitched moras as in *taBE-MOno*, $[[tabe-ta][mono]]_{NP}$ is pronounced with two sequences of high-pitched moras separated by low-pitched moras as in *TAbE-ta moNO*. Second, $[[tabe][mono]]_N$ does not allow a syntactic element like *souzaiya-no* 'delicatessen GEN' to be inserted between the constituents as in **tabe souzaiya-no mono*, but $[[tabe-ta][mono]]_{NP}$ does as in *tabeta souzaiya-no mono*. Furthermore, $[[tabe-ta][mono]]_{NP}$ has a different meaning from $[[tabe][mono]]_N$. The former denotes 'the thing which (I) ate' and the latter denotes 'food.'

3.1.1.4 Adjectival Nouns

Japanese has a lexical category called the adjectival noun. Adjectival nouns are characterized by their dual behavior as both nouns and adjectives. Adjectival nouns share properties with adjectives in their external distribution. Both of these categories modify a noun and may be modified by a degree adverb such as *totemo* 'very', as illustrated below in (3.5) and (3.6). However, an adjective takes the inflectional affix *-i* while an adjectival noun takes another inflectional affix *-na* when modifying the following noun, as we see from the contrast between *utukusi-i/muzukasi-i* in (3.5) and *ganko-na/anzen-na* in (3.6) (where INFL stands for an inflectional affix).

(3.5) Adjectives

- a. (*totemo*) *utukusi-i hito*
very beautiful-INFL person
- b. (*totemo*) *muzukasi-i hon*
very difficult-INFL book

(3.6) Adjectival Nouns

- a. (*totemo*) *ganko-na hito*
very stubborn-INFL person
- b. (*totemo*) *anzen-na basyo*
very safe-INFL place

On the other hand, adjectival nouns, like nouns, take the copular *da* when they function as a predicate. For instance, an adjectival noun such as *anzen* 'safe' takes the copular *da* to make the predicate in (3.7).

(3.7) *Kono basyo wa anzen da.*

This place TOP safe COP-PRES 'It is safe here.'

While an adjectival noun takes *-na* or *da* in forming phrases, these endings cannot be attached to the compound-internal adjectival nouns. Only the stem form of a word like *anzen* 'safe' may appear in the non-head position of a compound as in $[[anzen]_{AN}[kyouiku]_{N}]_N$ 'safety education (=education for safety)'.

An adjectival noun modifying a noun may take an inflectional affix as in $[[anzen-na][kyouiku]]_{NP}$ 'safe education', but such an expression is

considered to be not a compound noun but a noun phrase. The following shows that while the expression $[[\text{anzen}]_{\text{AN}}[\text{kyouiku}]_{\text{N}}]_{\text{N}}$ is a compound, the expression $[[\text{anzen-na}][\text{kyouiku}]]_{\text{NP}}$ is a phrase. First, $[[\text{anzen}]_{\text{AN}}[\text{kyouiku}]_{\text{N}}]$ is pronounced with one sequence of high-pitched moras as in *ANZEN-KYOUiku*, but $[[\text{anzen-na}][\text{kyouiku}]]_{\text{NP}}$ has two sequences of high-pitched moras separated by a low-pitched mora as in *ANZEN-na KYOUiku*. Second, $[[\text{anzen}][\text{kyouiku}]]_{\text{N}}$ does not allow a syntactic element like *nozomasi-i* 'desirable-INFL' to be inserted between the constituents as in **anzen nozomasi-i kyouiku*, but $[[\text{anzen-na}][\text{kyouiku}]]_{\text{NP}}$ does as in *anzen-na nozomasi-i kyouiku*. Furthermore, $[[\text{anzen-na}][\text{kyouiku}]]_{\text{NP}}$ has a different meaning from $[[\text{anzen}][\text{kyouiku}]]_{\text{N}}$. The former denotes 'education secure from dangerous ideas' and $[[\text{anzen}][\text{kyouiku}]]_{\text{N}}$ denotes 'education for safety.'

3.1.1.5 Verbal Nouns

The last category that I take up is a category known as verbal nouns. Verbal nouns are characterized by their ability to take the dummy verb *suru* 'do' in the predicate position of a sentence as in *kenkyuu-suru* 'do research,' *benkyoo-suru* 'study,' and *sagyoo-suru* 'work.' This is contrasted with nouns like *kodomo* 'child' and *isu* 'chair,' which cannot be verbalized by taking *suru* as in **kodomo-suru* 'child do' and **isu-suru* 'chair-do.'³

Verbal nouns behave like nouns in that they can take case particles. For instance, the verbal noun *sagyoo* 'work' can take case particles such as

³ It is uncertain whether the presence or absence of the dummy verb *suru* is a reliable criterion for verbal nouns. See also note 9.

ga, o, ni, and no, as shown in the underlined parts in (3.8).⁴

(3.8) a. *Sagyou ga susun-da.*

work NOM make-progress-PAST

'The work made progress.'

b. *Kare wa sagyou o yame-ta.*

He TOP work ACC stop-PAST

'He quit working.'

c. *Kare wa sagyou ni hagen-da.*

He TOP work DAT apply-oneself-to-PAST

'He applied himself to his work.'

d. *Kare wa sagyou no seika o jousi ni houkoku-si-ta.*

He TOP work GEN results ACC boss DAT report-do-PAST

'He reported the results of his work to his boss.'

Like nouns, verbal nouns appearing in the non-head position of a compound cannot take any case particles. Only a stem form of a word like *sagyou* 'work' may appear in the non-head position of a compound as in $[[sagyou]_{VN}[beya]_{N}]_N$ 'work room (=workshop),' and nouns with case particles cannot appear in the non-head position as in $*[[sagyou-ga][beya]]_N$, $*[[sagyou-o][beya]]_N$, and $*[[sagyou-ni][beya]]_N$.

Verbal nouns modifying a noun may take the genitive case particle *no*

⁴ For further discussion of verbal nouns, see Martin (1975), Kageyama (1982), and Uehara (1998), among others.

as in $[[sagyou-no][heya]]_{NP}$ 'work-GEN room', but such an expression is considered to be not a compound noun but a noun phrase. The following shows that while the expression $[[sagyou][beya]]_N$ is a compound, the expression $[[sagyou-no][heya]]_{NP}$ is a phrase. First, $[[sagyou][beya]]_N$ is pronounced with one sequence of high-pitched moras as in *saGYOU-BEYA* 'work room (=workshop),' but $[[sagyou-no][heya]]_{NP}$ has two sequences of high-pitched moras separated by low-pitched moras as in *SAGyou-no heYA*. Second, in $[[sagyou][beya]]_N$, the first consonant of the head word *heya* 'room' has become voiced to *beya* because of the application of the Rule of Rendaku, but in $[[sagyou-no][heya]]_{NP}$, the first consonant of the head word remains voiceless and cannot be similarly voiced as in **sagyou-no beya*. Third, $[[sagyou][beya]]_N$ does not allow a syntactic element like *sema-i* 'narrow' to be inserted between the constituents as in **sagyou sema-i beya*, but $[[sagyou-no][heya]]_{NP}$ does as in *?sagyou-no sema-i heya*. Furthermore, $[[sagyou-no][heya]]_{NP}$ has a slightly different meaning from $[[sagyou][beya]]_N$. The former denotes 'room (temporarily) used for work' and the latter denotes 'room intended for work' and

3.1.2 Possible Types of Ordinary Compounds

Having seen the properties of words constituting ordinary compounds, let us next consider possible combinations of categories of words which may constitute compounds. In Japanese, we can find compounds which consist of nouns (N), adjectives (A), adjectival nouns (AN), verbal nouns (VN) and verbs (V), but compounds containing a postposition are not attested. Given the five lexical categories, N, A, AN, VN and V, there are twenty five logically

possible combinations of the categories of words which constitute compounds, given in (A)-(Y) in Table 3-1 on the next page.⁵ Actual attested examples are listed in Table 3-1. Compound types whose examples are not attested are indicated by a slash.

Recall here that word structure rules are recursive and are capable of generating an infinite number of new words. If all the possible compound types in Table 3-1 are generated by word structure rules, they all exhibit the same possibilities of recursion and are productively used in forming new words. Among the possible compound types, however, only some types of compounds exhibit recursion and are productively used in forming new words. Others do not exhibit recursion and are rarely used in forming new words.

In what follows, in order to examine whether each of the compound types in Table 3-1 is generated by a word structure rule, I will consider the possibility of recursion and the productivity of each compound type.

⁵ I would like to thank Prof. Syoji Ishimaru for providing me with some examples in Table 3-1.

Table 3-1

(A) N+N <i>niku-dango</i> 'meat ball' <i>houseki-bako</i> 'jewelry box' <i>hai-zara</i> 'ashtray'	(B) A+N <i>ao-jashin</i> 'blue print' <i>aka-denwa</i> 'red phone' (public phone)	(C) AN+N <i>jiyuu-sekai</i> 'free world' <i>kanzen-hanzai</i> 'perfect crime'	(D) VN+N <i>benkyo-beya</i> 'study room' <i>sanpo-miti</i> 'stroll path'	(E) V+N <i>nagare-boshi</i> 'shooting star' <i>nomi-mizu</i> 'drinking water'
(F) N+A <i>iki-gurusi-i</i> 'breath suffer' (suffocate) <i>iji-kitana-i</i> 'one's nature dirty' (greedy)	(G) A+A <i>ama-zuppa-i</i> 'sweet sour' <i>hosonaga-i</i> 'thin long' <i>atu-kurusi-i</i> 'hot suffer'	(H) AN+A <i>baka-deka-i</i> 'foolish big' (very big)	(I) VN+A <i>kenka-ppaya-i</i> 'quarrel quick' (quarrelsome)	(J) V+A <i>ii-yasu-i</i> 'say easy' (easy to say) <i>hanasi-zura-i</i> 'tell hard' (hard to tell)
(K) N+AN <i>kinjo-meiwaku-na</i> 'neighborhood annoying' <i>kuti-jouzu-na</i> 'mouth good' (eloquent)	(L) A+AN	(M) AN+AN <i>katte-kimama-na</i> 'selfish willful' <i>kinben-jittyoku-na</i> 'diligent honest'	(N) VN+AN <i>kenkyuu-nessin-na</i> 'study enthusiastic' <i>kansatu-konnan-na</i> 'observation difficult'	(O) V+AN <i>home-jouzu-na</i> 'praising good' (flattering)
(P) N+VN <i>kyoudou-seikatu</i> 'community life' <i>yooroppa ryokou</i> 'Europe travel'	(Q) A+VN <i>usu-gesyuu</i> 'light makeup' <i>naga-touryuu</i> 'long sojourn'	(R) AN+VN <i>fuhou-touki</i> 'unlawful damping- garbage' <i>seimitu-kensa</i> 'close examination'	(S) VN+VN <i>tuseki-tyousa</i> 'follow-up survey' <i>reitou-hozon</i> 'freezing preservation'	(T) V+VN <i>kikitori-tyousa</i> 'hearing investigation' <i>fuki-souji</i> 'wipe cleaning'
(U) N+V <i>kosi-kake-ru</i> 'buttocks put' (sit down) <i>tabi-dat-u</i> 'trip stand' (start on a trip)	(V) A+V <i>ao-zame-ru</i> 'blue cool' (pale) <i>naga-bik-u</i> 'long draw' (drag on)	(W) AN+V	(X) VN+V	(Y) V+V <i>kiri-taos-u</i> 'cut down' <i>fumi-tubus-u</i> 'stamp flat' <i>tabe-sugi-ru</i> 'eat over'

The examples in (A)-(E) are instances of compound nouns. Compound nouns may consist of N, A, AN, VN and V on the left and N on the right. Among these compound types, N+N compounds exhibit recursion. For instance, the N+N compounds $[[iryou]_N[haikibutu]_N]_N$ 'medical waste' and $[[iin]_N[kai]_N]_N$ 'committee' may be combined together to form an N+N compound, (3.9a), which may further combine with a noun like *iin-tyou* 'chair person' to form an N+N compound as in (3.9b)⁶.

- (3.9) a. $[[[iryou]_N[haikibutu]_N]_N[[iin]_N[kai]_N]_N]_N$
 medical waste committee
- b. $[[[[iryou]_N[haikibutu]_N]_N[[iin]_N[kai]_N]_N]_N[iin-tyou]_N]_N$
 medical waste committee chairperson

Similarly, AN+N and VN+N compounds also exhibit recursion as shown in (3.10a-b).

- (3.10) a. $[[tokubetu]_{AN}[[kyodai]_{AN}[kenzou-butu]_N]_N]_N$
 special gigantic building
- b. $[[kyouiku]_{VN}[[sinsa]_{VN}[kai]_N]_N]_N$
 education examining committee

In (3.10a), an AN+N compound $[[kyodai]_{AN}[kenzou-butu]_N]_N$ 'gigantic building' combines with the adjectival noun *tokubetu* 'special' to form an AN+N compound. In (3.10b), a VN+N compound $[[sinsa]_{VN}[kai]_N]_N$

⁶ Both of the examples in (3.9a-b) are cited from a newspaper article.

'examining committee' combines with the verbal noun *kyouiku* 'education' to form a VN+N compound. The above three types of compounds are also productively used in forming new words in Japanese. Given the assumption that word structure rules are recursive and are capable of generating an infinite number of new words, along with the fact that N+N, AN+N and VN+N compounds exhibit recursion and are productively used in forming new words in Japanese, we are led to the conclusion that Japanese grammar contains the following word structure rules for compound nouns.

- (3.11) a. $N \rightarrow N \ N$
 b. $N \rightarrow AN \ N$
 c. $N \rightarrow VN \ N$

With respect to A+N and V+N compounds, I have no clear idea whether they are generated by word structure rules, at present. These compounds do not seem to exhibit recursion, but they are productively used in forming new words to some extent.

The examples in (F)-(J) are instances of compound adjectives. As we see from these examples, we can find actual compounds which consist of N, A, AN, VN and V, followed by A. However, none of these compounds seem to exhibit recursion. For instance, though the compound adjective $[[kenka]_{VN} [ppayai]_A]_A$ 'quarrel quick (=quarrelsome)' is actually attested in Japanese, it is impossible to form a compound adjective like (3.12), which consists of the compound verbal noun *oyako-genka* 'parent-child quarrel' and the adjective

haya-i 'quick.'⁷

(3.12) *[[[*oyako*]_N [*genka*]_{VN}]_{VN} [*ppaya*]_A]_A

Compound adjectives are not productively used in forming new words, either. In Japanese, compound adjectives are manifested by only a small number of attested actual compounds and are rarely used in forming new words. For instance, while a compound adjective like *iki-gurusi-i* 'breath suffer (=suffocate)' is attested in Japanese, it is impossible to form compound adjectives like **i-gurusi-i* 'stomach suffer' and **hana-gurusi-i* 'nose suffer.'

Considering the fact that compound adjectives do not exhibit recursion and are not productive, we may say that Japanese grammar does not contain word structure rules generating compound adjectives like A ---> N A. It must be noted here that the word *kusa-i* 'smell bad,' which belongs to the category of adjectives, may productively form compound adjectives like [[*abura*]_N [*kusa-i*]_A]_A 'smell of oil', [[*gasu*]_N [*kusa-i*]_A]_A 'smell of gas', [[*kemuri*]_N [*kusa-i*]_A]_A 'smell of smoke', [[*sakana*]_N [*kusa-i*]_A]_A 'smell of fish', and so on. We can create an infinite number of new adjectives with the word *kusa-i*. This adjective may also combine with a compound noun like [[[*haiki*]_{VN} [*gasu*]_N]_N to form a compound adjective [[[*haiki*]_{VN} [*gasu*]_N]_N [*kusa-i*]_A]_A. These facts suggests that Japanese grammar contains a word structure rule formulated in terms of the lexical item *kusa-i* like A ---> N *kusa-i*.

⁷ We have seen that Japanese compounds undergo the Rule of Rendaku. Japanese also has another phonological rule by which the first consonant of the head word of a compound becomes geminated as in *kenka-ppaya-i*.

The examples in (K)-(O) are instances of compound adjectival nouns. As we see from these examples, Japanese has actual compounds which consist of N, A, AN, VN and V on the left and AN on the right. As in the case of compound adjectives, however, these compounds are not considered to be generated by word structure rules, because they do not exhibit recursion. For instance, it is impossible to form a compound adjectival noun like (3.13), which consists of a compound noun like *gengo kenkyuu* 'language research' followed by an adjectival noun *nessin-na* 'enthusiastic'.

- (3.13) *[[*gengo*_N [*kenkyuu*]_{VN}]_{VN} [*nessin-na*]_{AN}]_{AN}
 language research enthusiastic

Compound adjectival nouns are not productively used in forming new words, either. For instance, while a compound adjectival noun like *kinjo-meiwaku-na* 'neighbor annoying' is attested in Japanese, it is impossible to form compound adjectival nouns like **oya-meiwaku-na* 'parent annoying' and **sensei-meiwaku-na* 'teacher annoying.' The facts above suggest that Japanese grammar does not contain rules generating compound adjectival nouns.

The examples in (P)-(T) are instances of compound verbal nouns. As we see from (P)-(S), compound verbal nouns may consist of N, A, AN, VN, and V on the left and VN on the right. Among the possible types of compound verbal nouns, N+VN, AN+VN and VN+VN compounds exhibit recursion, as shown in (3.14a-c).

- (3.14) a. $[[kenzou-butu]_N[[taisin]_N[hokyou]_{VN}]_{VN}]_{VN}$
 building earthquake-resistance reinforcement
- b. $[[tokubetu]_{AN}[[seimitu]_{AN}[kensa]_{VN}]_{VN}]_{VN}$
 special close examination
- c. $[[[koyou]_{VN}[sokusin]_{VN}]_{VN}[keikaku]]_{VN}$
 employment promotion plot

In (3.14a), the N+VN compound $[[taisin]_N[hokyou]_{VN}]_{VN}$ 'earthquake-resistance reinforcement' combines with the noun *kenzou-butu* 'building' to form a larger N+VN compound. In (3.14b), the AN+VN compound $[[seimitu]_{AN}[kensa]_{VN}]_{VN}$ combines with the adjectival noun *tokubetu* 'special' to form a larger AN+VN compound. In (3.14c), the VN+VN compound $[[koyou]_{VN}[sokusin]_{VN}]_{VN}$ combines with the verbal noun *keikaku* to form a larger VN+VN compound. The above three types of compound verbal nouns are also productively used in forming new words. Thus, we may say that Japanese grammar contains the following word structure rules for compound verbal nouns.

- (3.15) a. $VN \rightarrow N \quad VN$
 b. $VN \rightarrow AN \quad VN$
 c. $VN \rightarrow VN \quad VN$

In contrast to the above three types of compound verbal nouns (A+VN, AN+VN, and VN+VN), A+VN compounds are not considered to be generated by a word structure rule like $VN \rightarrow A \quad VN$, because they do not exhibit

recursion and are rarely used in forming new words⁸.

Lastly, the examples in (U)-(Y) are instances of compound verbs. As we see from these examples, Japanese has compound verbs whose non-head position is occupied by N, A, AN, and V, but not VN. Among the possible types of compound verbs, only V+V compounds exhibit recursion. For instance, a V+V compound $[[hasiri]_V[mawari]_V]$ 'run turn' may combine with a verb like *tuduke(-ta)* 'continue(-PAST)' to form a V+V compound as in (3.16a), which may further combine with a verb like *sugi(-ta)* 'excess(-PAST)' to form a V+V compound as in (3.16b).

- (3.16) a. $[[[hasiri]_V[mawari]_V][tuduke-ta]_V]_V$
run turn continue-PAST
'continued to run about'

⁸ There are cases where while the head of a compound can take dummy verb *suru* and hence is considered to be a verbal noun, the compound which it heads cannot take *suru*. For instance, the word *kenkyuu* 'research' takes *suru* as in *kenkyuu-suru* 'do research,' but when it combines with a noun *genko* 'language' to form a compound *genko-kenkyuu* 'language research,' the compound as a whole can no longer take *suru* as in *??genko-kenkyuu-suru*. There are also cases where while the constituent words cannot take *suru* and hence are not considered to be verbal nouns, the compound which consists of them can take *suru*. For instance, neither of the words *tukuri* 'making' nor *warai* 'smile' can take *suru* as in **tukuri-suru* and **warai-suru*, but when they are combined together to form a compound *tukuri-warai* 'making smile (=feigned smile),' the resultant compound as a whole can take *suru* as in *tukuri-warai-suru*. Furthermore, the dummy verb *suru* is hardly attached to compounds which consist of more than two words like (3.14a-c). These problems suggest that the presence or absence of the dummy verb *suru* cannot be a reliable criterion for verbal nouns.

- b. [[[*hasiri*]_v[[*mawari*]_v[[*tuduke*]_v[[*sugi-ta*]_v]_v]_v]_v]
 run turn continue excess-PAST
 'continued to run about too much'

V+V compounds are also productively used in forming new words in Japanese. Thus, we may say that the Japanese grammar contains a rule generating V+V compounds like (3.17).

$$(3.17) \quad V \text{ ---> } V \quad V$$

With respect to the other types of compound verbs (N+V, A+V), they are not considered to be generated by word structure rules like $V \text{ ---> } N \ V$, and $V \text{ ---> } A \ V$, because these compound types do not exhibit recursion and are not productively used in forming new words.

To summarize this subsection, Japanese grammar contains the word structure rules generating compounds in (3.11a-c), (3.15a-c) and (3.17), which are repeated here in (3.18).

$$(3.18) \text{ a. } N \text{ ---> } \left\{ \begin{array}{l} N \\ AN \\ VN \end{array} \right\} \quad N$$

$$\text{ b. } VN \text{ ---> } \left\{ \begin{array}{l} N \\ AN \\ VN \end{array} \right\} \quad VN$$

$$\text{ c. } V \text{ ---> } \quad V \quad V$$

3.2 Phrasal Compounds

Having considered the properties of ordinary compounds, let us now look at the properties of phrasal compounds. The examples in (3.19) are instances of phrasal compounds, which consist of an underlined noun phrase followed by a head noun.⁹

- (3.19)a. [sumai no oteire kyousitu]
house GEN maintenance lecture
'a lecture on the maintenance of a house'
- b. [akaru-i syokuba zukuri] (Kageyama 1993:332)
pleasant-INFL office making
'making an office a pleasant office'
- c. [beikoku ni sime-su taiousaku zukuri]_N (ibid. 333)
America DAT show-PRES measures making
'to prepare measures which are supposed to be shown to
(the government of) the U.S.'

The following shows that the underlined elements are phrases. First, they contain syntactic elements which are used in forming phrases, such as the genitive case particle *no* in (3.19a), the dative case particle *ni* in (3.19c), the present tense form of the verb *simes-u* in (3.19c), and the inflectional affix *-i* in (3.19b). Second, they display a pitch pattern characteristic of phrases; each constituent has its own high-pitched moras separated by low-pitched

⁹ The example in (3.19a) is cited from a newspaper article. The English glosses for the examples in (3.19b-c) are my own.

moras as in *SUmai no oTEire*, *aKARU-I syoKUBA*, and *BEIkoku ni siMEsu TAIousaku*.

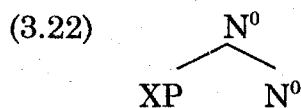
While the underlined constituents are analyzed as phrases, the bracketed entire structures in (3.19) can be considered as compounds, since they display properties characteristic of ordinary compounds. First, the underlined constituents are interpreted as generic, not as specific. Second, the underlined constituents are directly combined with the head nouns without taking any syntactic elements such as case particles and inflectional affixes. Third, they exhibit phonological properties characteristic of ordinary compounds. The last constituent of a phrasal modifier and the following head noun are pronounced with one sequence of high-pitched moras as shown in (3.20).

- (3.20) a. [[*SUmai-no oTEIRE*][*KYOusitu*]]
b. [[*aKARU-I syoKUBA*][*ZUkuri*]]
c. [[*BEIkoku ni siMEsu taIOUSAKU*][*ZUkuri*]]

Furthermore, in (3.20b-c), the word-initial consonant of the head noun *tukuri* has become voiced through the application of the Rule of Rendaku. Third, the bracketed structures in (3.19) have morphological integrity as shown by the fact that no syntactic elements can be inserted between the constituents as in (3.21).

- (3.21) a. * [*sumai no oteire*] *sinbun-sya-syusai-no*
house GEN maintenance sponsored by a newspaper
[*kyousitu*]
publishing company lecture
- b. * [*akaru-i syokuba*] *sekkyokuteki-na* [*zukuri*]
spirited-INFL office positive-INFL making
- c. * [*beikoku ni simes-u taiousaku*] *sekkyokuteki-na* [*zukuri*]
America DAT show-PRES measures positive-INFL making

Thus, the bracketed structures are analyzed as compounds containing a phrasal category. As is the case with English, I analyze the structure of a phrasal compound in Japanese as in (3.22).



In what follows, let us look more closely at the properties of phrasal compounds. I will first look at the internal structure of phrases which may appear in non-head positions, and then turn to look at the possible types of categories of words which may appear in the head position.

3.2.1 The Non-Head

As we see from the examples in (3.23) and (3.24), noun phrases (NP) and verbal noun phrases (VNP) may constitute phrasal compounds in

Japanese.¹⁰

- (3.23) a. [[*sumai no oteire*]_{NP} [*kyousitu*]_N]_N
house GEN maintenance lecture
'a lecture on the maintenance of a house'
- b. [[*akaru-i syokuba*]_{NP} [*zukuri*]_N]_N
pleasant-INFL office making
'making an office a pleasant office'
- c. [[*yutaka-na umi*]_{NP} [*zukuri*]_N]_N
rich-INFL sea making
'making the sea resourceful'
- d. [[*syougai o motu kodomo no syuugaku*
handicap ACC have children GEN school attendance
soudan]_{NP} [*hotto rain*]_N]_N
consultation hot line
'hot line for consultation concerning school attendance of
handicapped children'
- e. [[*Fukuoka no aji to waza*]_{NP} [*meguri*]_N]_N
Fukuoka GEN taste and skill tour
'tour of local foods and artifacts made in Fukuoka'
- (3.24) [[*kyuusui paipu no tekkyo*]_{VNP} [*kouji*]_{VN}]_{VN} (Hayashi 1987:241)
water pipe GEN removal construction
'construction by which water pipes are removed'

¹⁰ The examples in (3.23a,d) are cited from a newspaper article, and the example in (3.23e) is cited from an advertisement.

Phrasal compounds in (3.23) contain nouns modified by another noun (a), an adjective (b), an adjectival noun (c), a noun with a relative clause (d), and a conjoined noun phrase (e). The phrasal compound in (3.24) contains a verbal noun phrase.

Like in English, we can also find phrasal compounds whose non-head position is occupied by sentences like (3.25).¹¹

- (3.25) a. [[*zou wa hana ga naga-i*]_{IP} [*koubun*]_{NN}
 An elephant TOP nose NOM long-INFL construction
- b. [[*Otoosan, okaasan, itumademo ganba-tte*]_{IP} [*kyanpeen*]_{NN}
 Father, mother, forever work hard campaign
 'Father, mother, work hard forever' campaign

However, the other types of phrases cannot form a part of a phrasal compound. We cannot find phrasal compounds whose non-head position is occupied by an adjective phrase (AP) like (3.26), an adjectival noun phrase (ANP) like (3.27), a verb phrase (VP) like (3.28), or a postpositional phrase (PP) like (3.29).

- (3.26) *[[*juwaki ga aka*]_{AP} [*denwa*]_{NN}
 receiver NOM red telephone
 'a telephone which has a red receiver'

¹¹ The example in (3.25a) refers to a double subject construction in Japanese.

(3.27) *[[*jiyuu no siyou nikansite jiyuu*] _{ANP} [*syakai*] _N]_N

gun GEN use about free society

'the society in which the use of gun is free'

(3.28) *[[*isoide tabe*] _{VP} [*mono*] _N]_N

quickly eat thing

'thing which one eats quickly'

(3.29) *[[*gakkou kara*] _{PP} [*dayori*] _N]

school from letter

'letter form school'

The same kind of constraints as observed in English phrasal compounds are also observed in Japanese phrasal compounds. First, the non-head phrases cannot include noun phrases with a demonstrative like *kono* 'this' or a deictic pronoun like *anata* 'you' as in (3.29).

(3.29) a. *[[*kono sumai no oteire*] _{NP} [*kyousitu*] _N]_N

this house GEN maintenance lecture

b. *[[*syougai o motu anata no syuugaku*

handicap ACC have you GEN school attendance

soudan] _{NP} [*hotto rain*] _N]_N

consultation hot line

Second, the non-head phrases cannot include degree adverbs like *totemo* 'very' or *sonnani* 'so,' as shown in (3.30).

(3.30) a. ??[[*totemo yutaka-na umi*][*zukurī*]]

very rich-INFL sea making

b. *[[*sonnani yutaka-na umi*][*zukurī*]]

so rich-INFL sea making

Third, sentences which constitute phrasal compounds like (3.25) are interpreted as quoted expressions. Note here that quoted expressions which may appear in the non-head position of a phrasal compound are not restricted to Japanese sentences --- a sentence quoted from a foreign language such as English may constitute a phrasal compound as in (3.31).

(3.31) [['He did them build a castle (=He caused them to build a castle.)']

[*siki*]] *no ii-kata*

< Nishimura:33 >

style GEN expression

'He did them build a castle'-style expression

3.3.2 The Head

We have seen in Chapter II that, in English, among the categories of words which constitute ordinary compounds, N, A, V and P, only words belonging to N and A may appear at the head position of a phrasal compound. In Japanese, among the categories of words which constitute ordinary compounds, N, AN, A, VN and V, words belonging to N and VN may appear at the head position of a phrasal compound. We can find phrasal compounds whose head position is occupied by N and VN as in (3.32) and (3.33).

(3.32) [[*umi, fune, minato no syasin*]_{NP}[*kontesuto*]_N]_N

sea, ship, harbor GEN picture contest

'a contest for pictures of sea, ship and harbor'

(3.33) [[*kyuusui paipu no tekkyo*]_{VNP}[*kouji*]_{VN}]_{VN}

water pipe GEN removal construction

'construction by which water pipes are removed'

On the other hand, phrasal compounds whose head position is occupied by A, AN and V are virtually impossible. For instance, while an ordinary compound adjective like [[*kusa*]_N[*buka-i*]_A]_A 'grass deep-INFL (=grassy),' an ordinary compound adjectival noun like [[*mibun*]_N[*souou-na*]_{AN}]_{AN} 'one's means suitable (=within one's means),' and an ordinary compound verb like [[*kosi*]_N[*kake-ru*]_V]_V 'buttocks put-PRES (=sit down)' are actually attested in Japanese, the corresponding phrasal compounds in (3.34)-(3.35) are impossible¹².

(3.34) *[[*aoosita kusa*]_{NP}[*buka-i*]_A]_A

lush green grass deep

(Yumoto 1990:365)

(3.35) *[[*iyasii mibun*]_{NP}[*souou-na*]_{AN}]_{AN}

low birth suitable

(ibid.)

(3.36) *[[*omoi kosi*]_{NP}[*kakeru*]_V]_V

heavy buttocks put

(Kageyama 1982:244)

While English and Japanese have a different set of possible categories

¹² The English glosses for the examples in (3.34) and (3.35) are my own.

of words which constitute phrasal compounds, there is a correlation between actual ordinary compounds and possible phrasal compounds in both languages; categories of words which productively form ordinary compounds constitute phrasal compounds. In English, words belonging to A productively form ordinary compounds, so they may constitute phrasal compounds in English. In Japanese, on the other hand, words belonging to A, in most cases, do not productively form ordinary compounds, so they cannot constitute phrasal compounds either in Japanese. Recall here that among adjectives, the word *kusa-i* 'smell bad' productively forms ordinary compounds. This word may constitute phrasal compounds as in (3.37)¹³.

- (3.37) a. [[*kusatta tamago*]_{NP} [*kusa-i*]_A]_A
 rotten egg smelling-INFL
 'smell of a rotten egg'
- b. [[*sintiku-no ie*]_{NP} [*kusa-i*]_A]_A
 newly-built house smelling-INFL
 'smell of a newly-built house'

3.3 Summary

In this chapter, I have examined the properties of phrasal compounds in Japanese, and considered the similarities and differences between

¹³ As we have seen in 3.1.2, V+V compounds are productive in Japanese. Given that categories of words which productively form ordinary compounds may form a phrasal compound, it is predicted that we can find phrasal compounds which consist of a verb phrase on the left and a verb on the right. I leave this problem open. See also the discussion in 5.4.2.

Japanese and English. Each language has a different set of possible phrasal categories which constitute phrasal compounds. In English, NP, AP, VP, PP, IP and CP may form a part of a phrasal compound, while in Japanese, NP, VP, IP, and CP may constitute a phrasal compound, but the other phrasal categories (AP, ANP, VP and PP) do not. Common to both languages is the fact that (i) non-head phrases cannot include either demonstratives or deictics; (ii) non-head phrases cannot include degree words; and (iii) IP and CP which constitute a phrasal compound are restricted to quoted expressions. With respect to the head, Japanese and English have a different set of possible categories of words which constitute phrasal compounds. In English, among the categories of words which constitute ordinary compounds, N, A, V and P, only words belonging to N and A may constitute phrasal compounds. In Japanese, on the other hand, among the categories of words which constitute ordinary compounds, N, A, AN, VN and V, only N and VN may constitute phrasal compounds. Common to both languages is the fact that there is a correlation between actual ordinary compounds and possible phrasal compound; categories of words which productively form ordinary compounds may constitute phrasal compounds.

CHAPTER IV

THEORETICAL APPROACHES TO WORD FORMATION

In this chapter, in order to examine whether the properties of phrasal compounds as observed in Chapters II and III can be explained in the frameworks that have already been proposed, I will review three major theoretically different approaches to word formation: (i) the lexicalist approach, (ii) the syntactic approach and (iii) the modular approach. Under each of these approaches, various analyses of phrasal compounds have been proposed, but I will argue that none of the previous analyses can adequately describe or explain the properties of phrasal compounds.

4.1 Lexicalist Approach

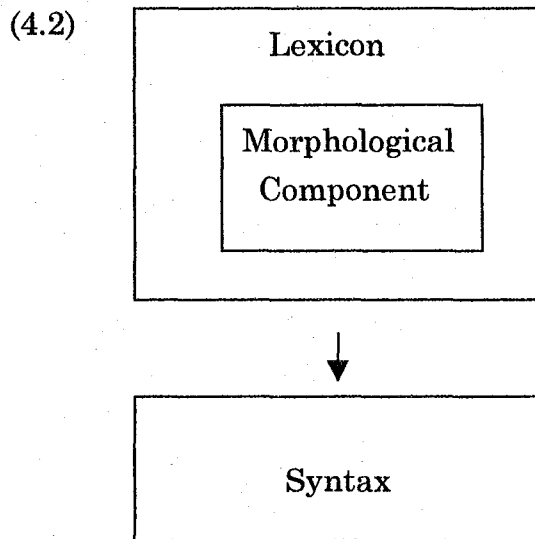
The lexicalist approach has been advocated by Chomsky (1970), Jackendoff (1972), Selkirk (1982), and Di Sciullo and Williams (1987), among others. The basic tenet of the lexicalist approach is summarized in (4.1).

(4.1) *Lexicalist Approach*

- (i) The grammar of a language contains an independent morphological component for word formation.
- (ii) The morphological component constitutes a sub-component of the lexicon.

- (iii) The morphological component interacts with syntax only at the interface; the output of morphology becomes the input of the syntax.

The internal organization of grammar concerning word formation advocated by the lexicalist approach is schematically represented in (4.2).



Given that words (X^0) are formed in the lexicon while phrases (XP) are formed in syntax, and that the output of syntax cannot be the input of morphology, it follows that XP cannot form a part of X^0 , and thus compounds containing an XP cannot be accommodated within the strictly lexicalist approach. In order to account for the possibility of phrasal compounds, we must either modify the assumptions above or add an auxiliary assumption to them. In the following subsections, I will review the analyses of phrasal compounds by Shimamura (1986) and Wiese (1996), which are basically conducted within the framework of the lexicalist approach, and will point out

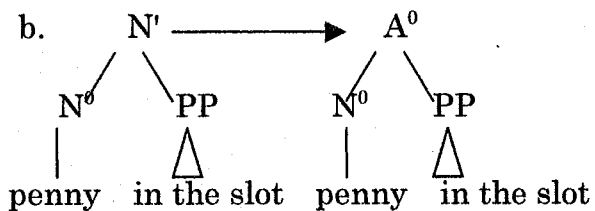
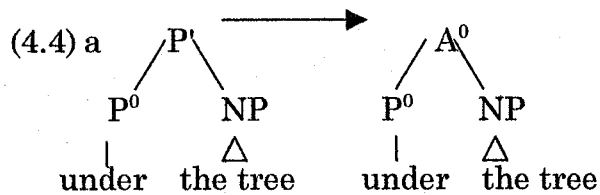
the problems of their analyses.

4.1.1 Shimamura (1986)

Shimamura proposes a Rule of Reanalysis, by which phrases at the X' level are reanalyzed into Y⁰. For instance, she analyzes the modifying element *under-the-tree* in (4.3a) as an A⁰ which has been reanalyzed from P' through application of the Rule of Reanalysis as illustrated in (4.4a). Similarly, the modifying element *penny-in-the-slot* in (4.3b) is taken as an A⁰ which has been reanalyzed from N' through application of the Rule of Reanalysis as illustrated in (4.4b).

(4.3) a. an *under-the-tree* picnic

b. a *penny-in-the-slot* machine



Shimamura argues that phrase structures to which the Rule of Reanalysis applies are restricted in form. It is proposed that phrasal categories at the X' level (N', A', V', P') may be reanalyzed into A⁰ and that

each phrasal category may have the internal structure as shown in (4.5a-d)¹.

(4.5) a. [N-PP]_N

e.g. a *penny-in-the-slot* machine, that *end-of-the-century* time

b. [A-VP]_A

e.g. an *easy-to-clean* room, a *hard-to-learn* manuscript

c. [V-NP]_V

e.g. *catch-cold* weather, *wash-hand* stand

d. [P-NP]_P

e.g. an *under-the-tree* picnic, an *after-the-party* mess

N can take only a PP complement or a PP adjunct, A can take only a VP complement, V can take only an NP complement, and P can take only an NP complement.

The internal structure of a complement phrase is also restricted. For instance, a noun contained in the structure in (4.5a) cannot be modified by an adjective or a demonstrative as in (4.6), and a verb contained in the structure in (4.5d) cannot be modified by an adverb as in (4.7).

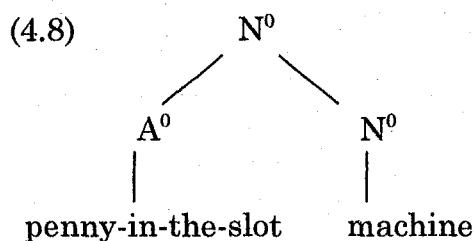
(4.6) a. *an *end-of-the-twentieth-century* time

b. *an *end-of-this-century* time

(4.7) **wash-hand-carefully* stand

¹ It is unclear whether these phrasal categories are reanalyzed into only adjectives.

On the basis of the discussion above, Shimamura claims that the Rule of Reanalysis applies in the lexicon and that phrase structures to which this rule applies are distinct from those generated in syntax.² Given that reanalyzed words are formed in the lexicon, these words, like other words, may be the input of other morphological processes such as compounding, and may constitute compounds³. A compound which contains a reanalyzed word is a phrasal compound. The structure of a phrasal compound like *penny-in-the-slot machine*, for instance, is represented as in (4.8), where the non-head position of a compound is occupied by A⁰, which has been reanalyzed from N' through the Rule of Reanalysis.



There are several problems with the analysis of phrasal compounds seen above. One problem is that conditions imposed on phrase structures which occupy the non-head position of a phrasal compound are too restrictive. The set of possible phrase structures which may occupy the non-head position of a phrasal compound is larger than the set of phrase structures listed in (4.5). For instance, we can find phrasal compounds whose non-

² It is unclear whether phrase structures which function as the input of the Rule of Reanalysis are generated in the lexicon on her analysis.

³ It is also discussed in Shimamura (1986:34) that reanalyzed words may be the input of affixation as in *matter-of-factness* (cf. Allen 1978:237).

head position is occupied by a noun with a quantifier as in (4.9) and a verb modified by an adverb as in (4.10).

(4.9) The drawbacks inherent in the methodology employed in the universal-typological [['many languages']_{NP}[approach]_N]_N are many. < Hall:47>

(4.10) an *ate-too-much* headache (Lieber 1992:11)

The second problem is that since Shimamura does not postulate any conditions for the categories of words which occupy the head position of a phrasal compound, the analysis fails to give an explanation for why the set of possible categories of words which constitute phrasal compounds is not the same as the set of possible categories of words which constitute ordinary compounds. As we have seen in Chapters II and III, the set of possible categories of words which constitute phrasal compounds is smaller than the set of possible categories of words which constitute ordinary compounds; both in English and in Japanese, only categories of words which productively form ordinary compounds may constitute phrasal compounds.

The third problem is that since Shimamura does not postulate any conditions for the position in which reanalyzed words may appear, her analysis leads by default to the conclusion that reanalyzed words can be placed in the head position as well as in the non-head position of a compound. However, it is impossible to form a phrasal compound whose head position is occupied by a phrase. For instance, a phrase like *sugar-on-the-tongue* whose intended meaning is 'sweet' cannot form a compound adjective as in

(4.11) (cf. *bitter-sweet*).⁴

(4.11) *[[*bitter*]_A[*sugar-on-the-tongue*]_A]_A

4.1.2 Wiese (1996)

Wiese (1996) claims that phrases appearing in the non-head position of a phrasal compound are quoted expressions, and argues that not only a quoted expression in the language in question but also an expression quoted from a foreign language may appear in the non-head position of a compound. In (4.12), for instance, English compounds contain a Malay phrase and a Chinese phrase, respectively.

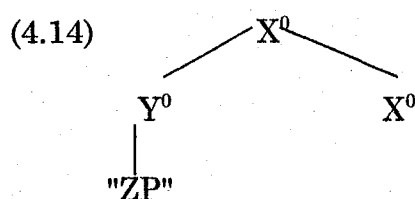
- (4.12) a. pasar-partois expression
 'marketplace-dialect' expression
- b. jiang-huayu campaign
 'speak-Mandarin' campaign

He also points out that a compound may contain even a non-verbal gesture, such as a gesture of despair, contempt, or insult, as in (4.13). A non-verbal gesture contained in a compound like (4.13), for instance, may be a shrug of the shoulders which means that 'I don't care'.

(4.13) his [*nonverbal gesture*] attitude

⁴ The example in (4.11) is provided by Christopher Tancredi.

In order to be able to generate these compounds, together with phrasal compounds, Wiese proposes that elements of one system may be brought into those of another system through the mechanism of quotation; a phrase generated in syntax may be brought into the morphological component only through this mechanism. This leads to the conclusion that a phrasal compound has the internal structure in (4.14), where the non-head position of a compound is occupied by a phrase which has been quoted from syntax.



In this quotation analysis, no structural conditions are postulated for phrasal compounds beyond those valid for ordinary compounds, and any quotable elements including verbal expressions and non-verbal gestures can appear as the constituent of a compound.

Weise's analysis has the same kinds of problems as pointed out for Shimamura (1986). Since no conditions are postulated for the possible categories of words which constitute phrasal compounds, the following fact is left unexplained: the set of possible categories of words which constitute phrasal compounds is smaller than the set of possible categories of words which constitute ordinary compounds.

Second, since no conditions are postulated for the position in which a quoted expression may appear, this analysis implies by default that quoted

expressions may be placed in the head position as well as in the non-head position of a compound. However, it is impossible to form a compound whose head position is occupied by a phrase as shown in (4.11).

4.2 Syntactic Approach

In contrast to the lexicalist approach, Lieber (1988,1992) advances a syntactic approach to word formation. The basic tenet of this approach is summarized in (4.15).

(4.15) *Syntactic Approach*

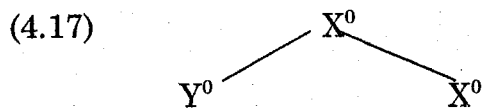
- (i) Word formation applies in syntax.
- (ii) Word structures, as well as phrase structures, are explained by the same set of syntactic principles.

The generally assumed X-bar theory contains the principles in (4.16).

(4.16) X-bar theory (general version)

- a. $X^n \rightarrow \dots X^{n-1} \dots$
- b. Only maximal projections (X^{\max}) may appear in the non-head position.

A word structure as in (4.17) is not derived from these principles, because principle (4.16a) does not allow recursion at the X^0 level and principle (4.16b) does not allow X^0 categories to appear in non-head position.



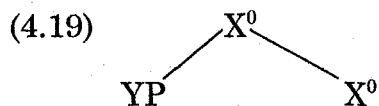
Lieber (1992) revises the principles of X-bar theory, so that the same set of principles account for word structures as well as phrase structures. She proposes that principle (4.16a) be modified to allow recursion at the X^0 level as in (4.18a) and that principle (4.16b) be modified to allow X^0 to appear in the non-head position as in (4.18b).

(4.18) X-bar theory (revised version)

- a. $X^n \rightarrow \dots X^{(n-1, n)} \dots$, where recursion is allowed for $n \neq 0$.
- b. Pre- or post-head modifiers may be X^{\max} or X^0 .

(Lieber 1992:38)

Principle (4.18b) also allows XP to appear in the non-head position of a word. Principle (4.18b), together with principle (4.18a), make the structure of a phrasal compound as in (4.19) possible.



In this analysis, phrasal compounds are given the same theoretical status as ordinary compounds or syntactic phrases. The following fact is thus left unexplained: phrasal compounds are more marked than ordinary compounds.

Furthermore, since Lieber does not postulate any structural conditions for the possible types of phrasal compounds, her analysis fails to capture the restriction observed on phrasal categories appearing in the non-head position and the restriction observed on categories of words which appear in the head position.

4.3 Modular Approach

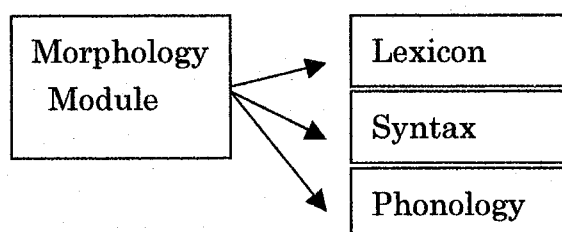
The last approach that I take up is the approach which has been developed in Shibatani and Kageyama (1988), Kageyama (1993), Baker (1988), and so on. The basic tenet of this approach is summarized in (4.20).

(4.20) *Modular Approach*

- (i) Word formation applies in any or all components of the grammar (specifically the lexicon, syntax or phonology).
- (ii) The rules and principles of morphology, which determine the well-formedness of word structures, constitute their own module.

The internal organization of grammar concerning word formation advocated by the modular approach is schematically represented in (4.21) (cf. Shibatani and Kageyama (1988)).

(4.21)



Within the framework of the modular approach, Kageyama (1993) suggests an analysis of Japanese phrasal compounds. In what follows, I will look at Kageyama's analysis and will point out problems with his analysis.

Kageyama (1993:328) claims that XP in general cannot form a part of X⁰, and regards phrasal compounds as in (4.22) as exceptional⁵.

- (4.22) a. [[*furuhon-ya* *no nyoubou*]_{NP} [*gorosi*]_N]_N
 secondhand bookstore GEN wife killing
 'killing the wife of an owner of a secondhand bookstore'
- b. [[*yutaka-na umi*]_{NP} [*zukuri*]_N]_N
 rich-INFL sea making
 'making sea resourceful'
- c. [[*ajisai* *no hana no tera*]_{NP} [*meguri*]_N]_N
 hydrangea GEN flower GEN temple tour
 'a tour for temples famous for hydrangeas'

He argues that only restricted lexical items such as *korosi* 'killing,' *tukuri* 'making' and *meguri* 'tour' and others may combine with a phrasal category to form a compound and that the property of taking a phrasal category to form a compound can be listed directly in the lexical entries for these items. Since listing in a lexical entry is arbitrary, Kageyama's analysis implies that there is no regularity to which words can form a phrasal compound. As we have seen in Chapters II and III, however, possible types of categories which

⁵ The English glosses for the examples in (4.21) are my own.

occur in the head position of phrasal compounds are not arbitrary; words which productively form ordinary compounds may occur in the head position of phrasal compounds.⁶

⁶ Baker (1988:71-72) claims that XP, in general, cannot form a part of X^0 because of a principle of morphology which blocks phrases inside a word. This principle is expressed roughly as in (i).

(i) * X^0

|
 X^n , where n is greater than 0.

However, he suggests in a note that the condition in (i) may be subject to linguistic variation, referring to the fact that phrasal compounds are productively formed in German and Dutch. This analysis implies that the morphology module contains a parameter with respect to the condition in (i), which would determine whether a given language allows phrasal compounds or not. In this analysis, however, the detailed properties of phrasal compounds in a given language are left unexplained.

CHAPTER V

A DYNAMIC APPROACH

In this chapter, I will propose an alternative analysis of phrasal compounds, assuming the general framework of the Dynamic Theories of Language (henceforth, DTL) which have been developed in Kajita (1977, 1997)¹. Before presenting the analysis, I will first review some of the basic assumptions of DTL (in Section 1). Based on these assumptions, I will propose that phrasal compounds are derived from ordinary compounds through extension of the types of possible items in the non-head positions and that this extension is triggered by a certain conflict between form and meaning (in Section 2). I will show that this alternative can not only explain the properties of phrasal compounds, but can also give a principled and unified account of various phenomena concerning language acquisition and cross-linguistic variation (in Sections 3 and 4).

5.1 Dynamic Theories of Language

Kajita (1977,1997) develops a 'dynamic' approach to language. This approach is contrasted with the 'static' approach taken by Chomsky². In

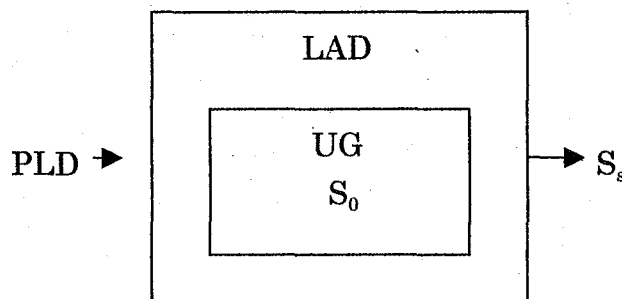
¹ The analysis in this chapter is based on and developed from Komatsu (1998) and two papers read at the regular meeting of the Tokyo English Linguistics Circle (TELC) held at Sophia University (June 20, 1998 and June 19, 1999). The slightly different version of this chapter was also read at the annual meeting of Tokyo Area Circle of Linguistics (Summer Institute of Linguistics) held at Tokyo Metropolitan University (September 12, 1998).

² Kajita works in a basically Chomskyan framework. He assumes that (i) language is a state of the brain, and that (ii) the architecture of language is

order to place the former approach in a proper perspective, let us first briefly review some of the basic assumptions of the latter approach.

Chomsky claims that human beings are genetically endowed with some linguistic knowledge. This innate knowledge, which is referred to as the Language Acquisition Device (LAD) or Language Faculty, includes principles common to all human languages. These principles constitute Universal Grammar (UG). UG is a theory of the initial state S_0 of the relevant component of the LAD. S_0 is taken as a function mapping the totality of data available to the language learner, which is called the Primary Linguistic Data (PLD), to the steady state S_s attained, i.e. the grammar of the final stage of language acquisition (adult grammar) in a particular language. Chomsky views the model of language acquisition as in (5.1), where language acquisition is idealized as if S_0 mapped the PLD instantaneously to S_s .

(5.1)



The crucial assumption of this 'instantaneous' model of language acquisition is that the order of presentation of data does not affect the characteristics of

elucidated by means of empirical science.

S_n ; the grammars of the non-final (intermediate) stages of language acquisition play no role in explaining the characteristics of the final stage of grammar.

As pointed out by Kajita, if the instantaneous model of language acquisition is taken, then the theory of UG consists of rules or principles in the following form:

(5.2) Theory Format (I)

Rules of type W are possible in a grammar G (where W is characterized exclusively in terms of the properties of adult grammars, with no reference to intermediate grammars).

(Kajita 1983:4)

Theory Format (I) does not take into account the process of acquisition and in that sense it is 'static.' Under such an approach, the class of 'possible grammars' is determined solely in terms of the characteristics of the form of adult grammars.

However, Kajita (1977, 1983, 1997) argues that it would be impossible for such a static approach to both accommodate a wide range of complex empirical phenomena and severely restrict the class of possible grammars³. He claims that the real regularity of language lies, not in the characteristics of adult grammars, but in the process of acquisition, and that the grammars

³ The dynamic approach has been empirically supported by many studies on various phenomena including passives, negation, relativization, and wh-movement. See the select bibliography compiled by Kajita (1992) and also articles based on the dynamic approach in Ukaji et al. (1997).

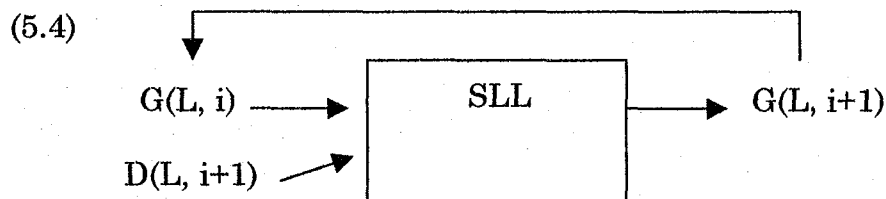
of the intermediate stages of acquisition play an important role in explaining both the uniformity and diversity of adult grammars as well as the course of language development.

Kajita assumes that, schematically, language acquisition proceeds step by step in the following way:

(5.3) "First, the child who is to learn a language, L, equipped with the prelinguistically given system of language learning, SLL, receives and processes a set of data drawn from L, $D(L, 1)$, and constructs a grammar at the first stage of L, $G(L, 1)$. Then the child goes on to process another set of data, $D(L, 2)$, and constructs a grammar at the second stage of L, $G(L, 2)$, on the basis of $G(L, 1)$ and the SLL. Repeating this process at subsequent stages until reaching the final stage, the child attains the adult grammar of L, $G(L, n)$."

(Kajita 1997:378)

The model of language acquisition assumed in (5.3) is schematically represented in (5.4), where the acquisition of grammar is considered to be 'non-instantaneous'.



SLL consists of dynamic principles which govern the possible grammatical transition from one stage of language acquisition to the next. Kajita proposes that Theory Format (I) should be replaced by Theory Format (II) below in (5.5).

(5.5) Theory Format (II)

- (A) Rules of type X are possible in G. (X: far more restrictive than W)
- (B) If rules of type Y are possible in G_i^j , then rules of type Z are possible in G_{i+1}^j . (Superscripts: particular languages; subscripts: stages of acquisition)

(Kajita 1983:4)

Theory format (II-A) is a general statement which should hold at any stage of acquisition of any natural language. Principles falling under the statement of (II-A) include the universal principles listed in (5.6)⁴.

- (5.6) a. ASSOCIATE a form and a meaning.
- b. ANALYZE form-meaning associations.
- c. CATEGORIZE form-meaning associations.

Although these principles are still schematic and have to be elaborated in more detail, I will later argue that principles of these kinds are at work in the process of acquisition of rules for compounding.

⁴ Kajita (1999b) suggests that these principles are still schematic and need to be elaborated in more detail.

Theory format (II-B) defines the possible grammatical transition from one stage of language acquisition to the next, by saying that "if rules of type Y are possible in a grammar at a certain stage of language acquisition, then rules of type Z are possible in the grammar at the next stage."

Before going on to the analysis of phrasal compounds, let us here mention some of the basic advantages of the dynamic approach over the static approach. First, it can account for the success of language acquisition more easily. Rules of Type X in (II-A) are far more severely restrictive than those of the type W in (I). Kajita (1997:378) suggests (5.7) as a working hypothesis.

- (5.7) Only those linguistic properties that are actually realized in every language can be prelinguistically given.

Given that the set of X-rules is much smaller than the set of W-rules and that the set of possible rules at successive stages is determined on the basis of the grammar already acquired at the preceding stage, the set of possible rules for a child at any stage is much smaller in (II) than in (I). In (I), a child at any stage has to take into account all the possibilities within a large number of W-rules in order to determine the set of possible rules.

Next, the dynamic approach can account for the course of language development "more directly in terms of the general theory of grammar" (Kajita 1983:4), since (II-B) refers to the process of language acquisition and suggests that the set of grammars possible at the next stage is determined on the basis of the grammar already acquired. Under the static approach,

however, it is necessary to append a special theory of acquisition such as the theory of "maturation" (cf. Borer and Wexler 1987, Wexler 1990) in order to account for the course of language development.

Lastly, under the dynamic approach, there is no need to append a special theory of markedness, which has been thought necessary under the static approach. (II-B) suggests that "certain rules are in some sense 'more basic' than others and more or less constitute the core of the grammar, while others are in some sense peripheral and derived from the corresponding basic rules" (Kajita 1977:72).

5.2 A New Analysis of Phrasal Compounds

It is generally assumed that grammar consists of the linguistic units such as morphemes, words, compounds and phrases, and that they are universally given. It is known that there is no language which does not have linguistic units such as words and phrases, while there are some languages which do not allow compounds. Given a working hypothesis of DTL in (5.7), it follows that compounds are not prelinguistically given, but that they are derived through dynamic processes. Thus, the first thing we have to do is to see how ordinary compounds are analyzed under the dynamic analysis. This we will do in Section 5.2.1 and then we go on to discuss how phrasal compounds become possible in 5.2.2. Consequences of the analysis presented in 5.2.1 and 5.2.2 are discussed in 5.2.3.

5.2.1 A Dynamic Approach to Ordinary Compounds

It is proposed in DTL (cf. Kajita (1998)) that children acquire rules generating complex words by applying the universal principles in (5.6) to the primary linguistic data. For the sake of simplicity of discussion, I would like to confine myself to the examination of the example of N+N root compounds in English. English-speaking children acquire a rule generating N+N root compounds in the following way.

First, children acquire a number of words and store them in their lexicons, guided by one of the universal principles, ASSOCIATE. ASSOCIATE helps children to associate a meaning with an appropriate word form. The words acquired through this principle include simple words as well as complex words. The term 'complex word' here means that it is analyzable into morphemes in the adult grammar. Children at this stage of language acquisition produce or understand complex words without analyzing them into morphemes, and use a compound word, as well as a simple word, as one form-meaning pair. For instance, children use compounds such as *garbage man*, *mailman*, and *policeman* in the same way as simple words such as *cook*, *pilot*, and *janitor*. I will refer to the grammar at this stage of language acquisition as G_i (where the subscript i indicates some stage of language acquisition).

At the next stage (G_{i+1}), children analyze these words into morphemes, guided by the universal principle, ANALYZE. ANALYZE is applicable to words whose constituent words have already been acquired. For instance, the compound word *garbage man* is analyzed into *garbage* and *man*, the compound word *mailman* is analyzed into *mail* and *man*, and so on. The

plausibility of this assumption is confirmed by Clark (1993:39-42), where it is observed that children sometimes spontaneously talk about how the meaning of a compound is inferred from the meaning of its constituent words as shown in the utterances in (5.8) (where C is a child (year; month, week), and Mo is his mother).

(5.8) a. C (2;4,3, looking at toy car): *That a motor-car. It got a motor.*

b. Mo (pointing at picture of lady-bug): What's that?

C (2;4,13): *A lady-bug! That like "lady."*

c. C (2;11,28, looking at flowering ice-plants): *What's that called?*

Mo: That's ice-plant.

C: *Does it grow ice?*

As the number of N+N compounds stored in the lexicon increases, compounds which share common properties are grouped together. Compounds containing the same lexical item form a coherent group. For instance, the compounds *garbage man, policeman, mailman*, and so on form one coherent group, since they contain the same lexical item *man*. This group of compounds includes compounds where the word at the non-head position belongs to the same syntactic category, 'noun.' Children apply the universal principle, CATEGORIZE, to the words in the non-head position of these words, and then come up with a rule like (5.9), which is formulated with reference to a specific lexical item, *man*. CATEGORIZE is applicable to words whose head and non-head positions are occupied by various lexical items belonging to the same syntactic category. I will refer to the grammar

at this stage of language acquisition as G_{i+2} .

(5.9) N ---> N *man*

Children who have acquired a rule like (5.9) can create novel compounds by combining the word *man* and any word belonging to the category 'noun.' For instance, it is reported in Clark (1981), Clark, Hecht and Mulford (1986) and Clark (1993) that children often produce novel compounds with the noun head *-man* as in *rat-man* (2;0) 'man who works with rats [in a psychology lab],' *store-man* (2;5) 'clerk,' *firetruck-man* 'fireman,' and *plant-man* (3;0) 'gardener.'

Children go on acquiring more and more compound rules which are formulated with reference to specific lexical items. For instance, when children's attention begins to be drawn to different kinds of cars like *police car*, *sports car*, *street car*, *sleeping car*, and come up with a rule like (5.10), by applying the universal principles, ANALYZE and CATEGORIZE, to these words.

(5.10) N ---> N *car*

In this way, children acquire rules generating ordinary compounds whose head position is occupied by different lexical items as in (5.11).

(5.11) a. N ---> N *man*

b. N ---> N *car*

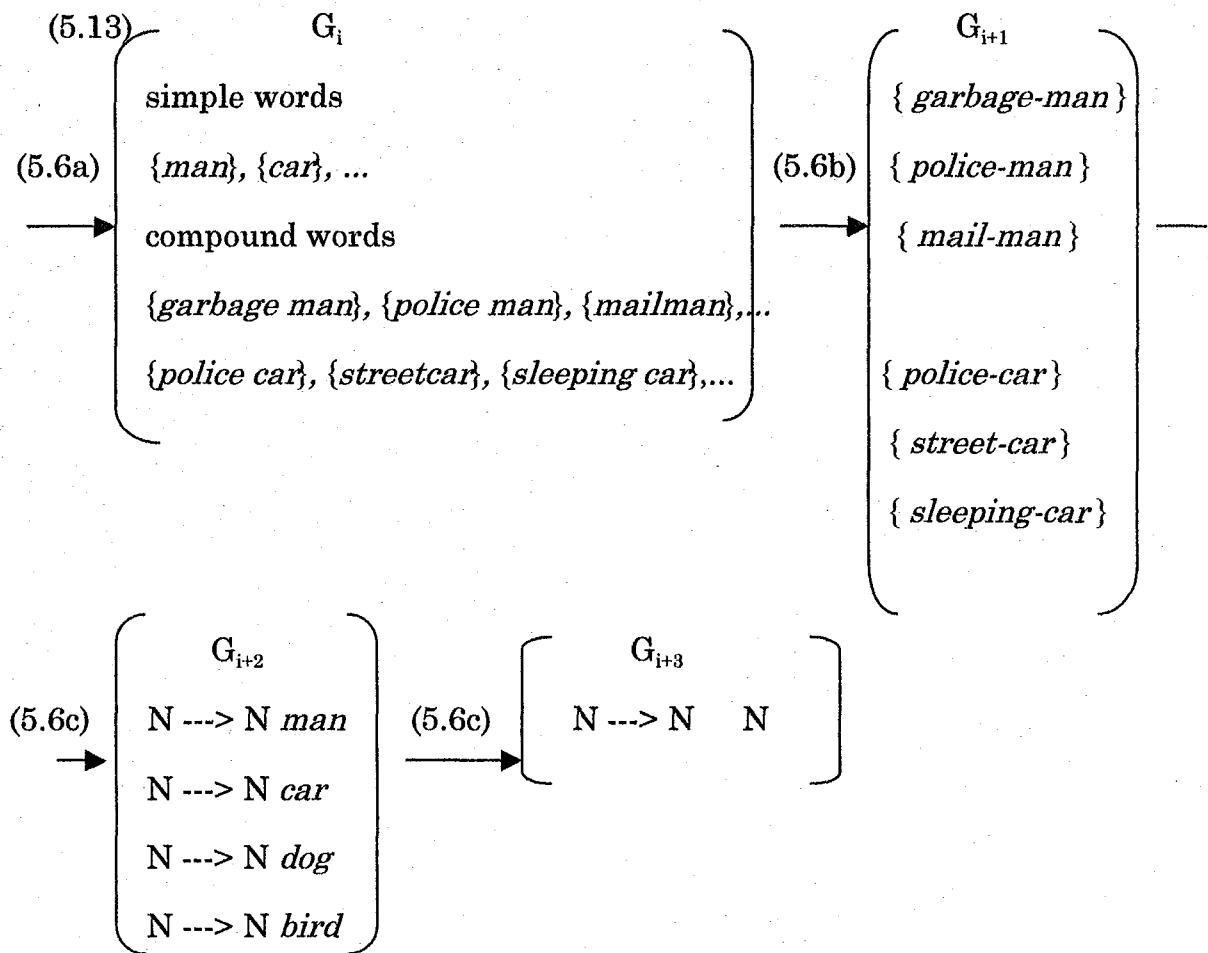
- c. N ---> N *dog*
- d. N ---> N *bird*

Children who have acquired rules in (5.11) produce novel compounds like *beach-car* or *taxi-car* (1;6) for different kinds of cars; *chow-dog*, *dalmatian-dog* (2;2) or *poodle-dog* (2;6) for different kinds of dogs; and *crow-bird* (1;6), *parrot-bird* or *flamingo-bird* (2;7) for different kinds of birds.

When children become aware that the lexical items which occupy the head position are, in many cases, nouns, then they apply the universal principle, CATEGORIZE, to the rules in (5.11) and generalize them into one rule like (5.12), which is formulated with reference to a specific syntactic category, 'noun.' I will refer to the grammar at this stage of language acquisition as G_{i+3} .

$$(5.12) \quad N \text{ ---> } N \quad N$$

To summarize the discussion so far, the process of acquisition of a rule generating N+N compounds in English is schematically represented in (5.13). In (5.13), square brackets indicate each stage of acquisition, and arrow indicates transition of stages and what kinds of dynamic rules or principles apply.



Following the lexicalist approach, I assume that these compound rules constitute a subcomponent of the lexicon, morphology. Morphology consists of rules obtained by application of the universal principles to the primary linguistic data, i.e. actual ordinary compounds stored in the lexicon.

5.2.2 A Dynamic Approach to Phrasal Compounds

Now that we have shown how ordinary compounds are analyzed under the dynamic theory, I would like to discuss how phrasal compounds can be treated in a dynamic process like (5.13). Since we cannot account for phrasal compounds under the lexicalist approach without introducing some modifications, as we have seen in Chapter IV, I claim that syntactic phrases can be brought into the lexicon under narrowly restricted conditions and that those conditions cannot be specified without reference to the dynamic process.

I would like to argue that children who have acquired rules generating ordinary compounds may create a phrasal compound by placing XP in the non-head position of an ordinary compound when they feel a need to express a complex concept which is ordinarily carried by an XP and which cannot be conveyed by a simple word but which nevertheless corresponds to a non-specific, coherent semantic unit and can be conveyed by a compound. Thus, phrasal compounds are derived from ordinary compounds through the extension of the types of possible items in the non-head positions only when the following conditions are satisfied.

- (5.14) (i) It is necessary to express a complex concept which is ordinarily expressed by an XP.
- (ii) The concept corresponds to a non-specific, coherent semantic unit, and hence can be conveyed by a compound.

We may say that the use of a phrasal compound is motivated by a conflict between form and meaning⁵.

In order to illustrate the main points discussed so far, let us consider specific examples. It is reported in Clark, Hecht and Mulford (1986) that children who have acquired a rule generating root compounds but not a rule generating synthetic compounds produce a compound noun whose non-head position is occupied by a verb phrase like *a pull-wagon-man* 'a man who pulls a wagon.' Such a compound is used to denote the agent of an action. The agent of an action refers to an entity understood as the external argument of a certain predicate (cf. Levin and Rappaport (1988), Rappaport and Levin (1992)) and thus carries a more complex concept than a single entity denoted by a simple word like *boy* does. Since the meaning of an action is ordinarily expressed by a verb phrase, we may say that the agent of an action contains a semantically complex concept which is ordinarily expressed by a phrase. The agent of an action which is expressed by means of a compound is also interpreted as non-specific. For instance, the noun element *wagon* contained in the compound *pull-wagon-man* does not refer to any specific wagon. Similarly, the verb phrase *pull-wagon* does not refer to any specific action at any specific point in time. The compound *pull-wagon-man* is not used to denote 'a man who pulled a wagon yesterday' or 'a man who is pulling a wagon at this very moment' but 'a man who (habitually) pulls wagon' (cf. Di Sciullo and Williams 1987:50). Furthermore, the agent of an action is

⁵ The notion of a conflict between form and meaning has often played an important role in the dynamic approach. 'Syntactico-semantic discrepancy' proposed in Kajita (1977:47) is one major condition under which a new rule is introduced in grammar by extension.

considered to be a coherent semantic unit because it refers to a single entity, 'a man who pulls a wagon.' As we have seen so far, the agent of an action expresses a complex concept which is ordinarily carried by a verb phrase, but nevertheless corresponds to a non-specific, coherent semantic unit. In order to express such a complex concept, children create a phrasal compound like *pull-wagon-man* by placing a verb phrase in the non-head position of an ordinary compound.⁶

Phrasal compounds created by the adult grammar also meet the semantic conditions above in (5.14). Consider, for instance, the example a *fish-and-vegetable store*. This compound may be used to denote 'a store which sells fish and vegetables.' In this compound, the meaning of the modifying element *fish-and-vegetable* expresses a combination of two entities, which is considered to be a more complex concept than a single entity expressed by a simple word like *book*. A combination of two entities is ordinarily expressed by two noun phrases coordinated with the conjunctive *and*. The coordinate noun phrase *fish and vegetable* in the non-head position is interpreted as non-specific. Neither of the two nouns *fish* or *vegetable* refers to a specific fish, salmon, or specific vegetable, carrot. While the coordinate structure of noun phrases denotes a combination of two entities, the compound containing the coordinate noun phrase as a whole denotes a single entity, that is, perishables, and is thus considered to be a coherent semantic unit. The phrasal compound *fish-and-vegetable store* is interpreted as 'a store which sells perishables,' but not as 'a store which sells

⁶ I will return to the issue concerning novel compounds created by children in 5.3.

various kinds of fish and a store which sells a various kinds of vegetables.' In relation to this, a phrasal compound like *a fish-or-vegetable store* is considered to be unacceptable because the modifying disjunctively conjoined noun phrase denotes two different entities and thus does not form a coherent semantic unit.⁷

5.2.3 Discussion

The analysis presented above has several consequences. First, given that phrasal compounds are derived from ordinary compounds through extension, it follows that phrasal compounds share properties with ordinary compounds. As we have seen in Chapters I, II and III, phrasal compounds share properties with ordinary compounds in that (A) their constituents are interpreted as having generic reference, not specific reference; (B) they exhibit the same phonological patterns (a stress pattern (in English) or a pitch pattern (in Japanese)); and (C) they have morphological integrity and do not allow any syntactic element to be inserted between the constituents.

Second, the markedness of phrasal compounds follows. Given the analysis above, ordinary compounds are more basic than phrasal compounds

⁷ The analysis presented in this subsection is still schematic and needs to be elaborated in more detail. One of the points which need to be defined is what constitutes 'a coherent semantic unit.' In relation to this problem, it is discussed in Clark, Gelman and Lane (1985) that children understand the meaning which is expressed by compounds from as young as 2;6. According to the results of their experiment, children, like adults, "produced more compounds for like objects that differed on intrinsic properties than were unrelated, and for contrasting objects that differed on intrinsic properties than for unrelated objects in momentary juxtaposition." Taking into account data in language acquisition, I would like to explore the problem above in the future research.

and hence belong to the core of a grammar, while phrasal compounds are derivative and more or less belong to the periphery of a grammar.

Third, the syntactic categories of words which may appear in the head position of a phrasal compound are narrowly restricted by referring to the grammar already acquired. As we have seen in Chapter II, English grammar contains rules generating compound nouns and compound adjectives. Given that the possible types of phrasal compounds are determined on the basis of rules generating ordinary compounds, along with the fact that English grammar contains rules generating compound nouns and compound adjectives, it follows that English allows both phrasal compounds with a noun head like *the* $[[\textit{save-the-whale}][\textit{campaign}]_{\text{N}}]_{\text{N}}$ and those with an adjective head like $[[\textit{cold-weather}][\textit{cozy}]_{\text{A}}]_{\text{A}}$. Japanese grammar, on the other hand, contains rules generating compound nouns, but not rules generating compound adjectives, as we have seen in Chapter III. Thus, in Japanese, phrasal compounds with a noun head are frequently used as in $[[\textit{sumai no oteire}][\textit{kyousitu}]_{\text{N}}]_{\text{N}}$ 'maintenance-of-a-house lecture,' but phrasal compounds with an adjective head are virtually impossible as in $*[[\textit{aoao-si-ta kusa}][\textit{buka-i}]_{\text{A}}]_{\text{A}}$ 'lush-green deep'.

Lastly, possible phrases which may appear in the non-head position of a phrasal compound are narrowly restricted by postulating the semantic conditions in (5.14). We have seen in Chapters II and III that both in English and in Japanese, the following constraints are imposed on phrases in the non-head position of phrasal compounds: (i) non-head phrases cannot include either demonstratives or deictics; (ii) non-head phrases cannot include degree words; and (iii) IP and CP contained in a phrasal compound

are restricted to quoted expressions. Conditions (i) and (iii) are attributed to property (A) above. Since the constituents of a compound are interpreted as non-specific, a noun phrase containing a demonstrative adjective like *this whale* and a deictic pronoun like *that*, which are interpreted as having specific reference, cannot constitute a compound as in **the save-this-whale campaign* and **the save-that campaign*.⁸ With respect to condition (iii), CP and IP, in general, contain reference to time, which is expressed with the inflectional property of a verb contained in these phrases. Since CP and IP contain reference to time, they are excluded from compound internal position. However, when they are used as a quoted expression, they may no longer be interpreted as having specific reference to time since quotation is an act of repeating an utterance made by someone. For instance, the phrasal compound *I-never-loved-her-anyway defense* is possible when the modifying element *I never loved her anyway* is interpreted as a quoted expression and does not refer to a specific point in time. In relation to this point, Christopher Tancredi (personal communication) points out that the phrasal compound *the save-this-whale campaign* becomes possible when the phrase *save-this-whale* is interpreted as a quoted expression, in which case the compound as a whole could mean 'the campaign in which volunteers run around saying "Save this whale." Condition (ii) is left unexplained.

In the following two sections, I will show that the analysis presented above gives a unified and principled account of various phenomena concerning language acquisition and typological variation.

⁸ This point has already been discussed in Shimamura (1986).

5.3 Different Patterns of Errors Made in the Process of Acquisition of English Synthetic Compounds

Given that possible types of phrasal compounds are determined on the basis of the grammar already acquired, it follows that different types of phrasal compounds become possible at different stages of language acquisition. This assumption gives an explanation for different patterns of errors made in the process of acquisition of English synthetic compounds investigated by Clark and her colleagues (Clark 1981, Clark, Gelman, and Lane 1985, Clark, Hecht, and Mulford 1986, and Clark 1993). Let us first briefly review their basic findings in 5.3.1.

5.3.1 Synthetic Compounds in Early Child English

Clark and her colleagues examined how English-speaking children acquire various morphological forms (specifically, compounds, affixes, or their combinations). They argue that a certain regularity is seen in the forms children produce and the order in which they acquire different forms, assuming that if they produce a novel word with a correct morphological form, then those children have acquired the form.

I am specifically concerned here with novel nouns children produce for things. The data upon which Clark et al. draw come from two sources: the corpus of novel nouns spontaneously produced by a number of English-speaking children aged two to six, and data from elicitation studies.

According to their analysis, children use compounds as novel nouns from an early stage. They produce novel compounds from as young as before age two. All the earliest compounds consist of combinations of simple

nouns, root compounds, such as *plant-man* and *present-man* (cf. Clark 1981, Clark, Gelman, and Lane 1985). In producing these compounds, they hardly make errors by age 2;6 (two years and six months) or 3.

Although children freely produce novel primary compounds from an early age, they rarely use synthetic compounds before age 3. When they begin to use these compounds, they often make errors. Their forms do not conform to adult usage. Only around age 5 to 6 do they acquire how to form these compounds.

In order to demonstrate the above, Clark, Hecht and Mulford (1986) conducted an elicitation study in which they asked children to give names to agents and instruments. According to the results of this study, the younger children, especially the three- and four-year-olds, made many more errors in their compound patterns, than the older children. Of the compounds used by the children in this elicitation task, the majority were two-part compounds, and the rest three-part compounds. A two-part compound pattern was divided into the following three classes. Suppose that the children were asked to give a name to 'someone who pulls wagons' or 'something who pulls wagons'. One group of children used a verb stem as a modifier with a certain familiar head noun such as *-man*, *-thing*, as in *pull-man* or *pull-thing*. These compounds were schematically represented as V-MAN or V-THING. The second group of children formed ungrammatical compounds from verb phrases with a verb and a noun combined in that order, as in *pull-wagon* (V-O). When they attached affixes like *-er* to such compounds, they attached them to a verb stem in the left position, as in *puller-wagon* (V-er-O). The third group of children formed compounds

which conformed to adult patterns, as in *wagon-puller* (O-V-er). There were also children who used ungrammatical three-part compounds which consisted of a verb phrase and the head noun, as in *pull-wagon-man* and *pull-wagon-thing* (V-O-MAN or V-O-THING). Table 5-1 below summarizes the course English-speaking children generally followed in learning how to form synthetic compounds (where the stages from one to three indicate the stages children go through, and the asterisk indicates that the form so marked is ungrammatical in adult usage).

Table 5-1

Stage 1	* V + MAN or V +THING	(e.g. <i>pull-man, pull-thing</i>)
Stage 2	* V + O	(e.g. <i>pull-wagon</i>)
	* V-er + O	(e.g. <i>puller-wagon</i>)
Stage 3	O + V-er	(e.g. <i>wagon-puller</i>)

For the explanation of the facts shown above, the following acquisition principles are proposed: (i) Transparency of Meaning (speakers try to interpret and coin new words that are transparent in meaning --- that is, words that are based on known roots and affixes); (ii) Simplicity of Form (speakers find it easier to interpret and coin a new word the simpler it is in form --- that is, the less its root changes in its construction); (iii) Productivity (in forming new words, speakers rely on the most productive option with the appropriate meaning). It follows from principle (ii) that children initially form compounds without affixes, i.e. root compounds, before forming compounds with affixes, i.e. synthetic compounds. When they are asked to

form synthetic compounds, they initially form ungrammatical synthetic compounds without affixes as in V-MAN or V-THING before forming ones with affixes as in V-er O or O-V-er. Given principle (iii), children choose the compound patterns which are the most productive for adults, i.e. O-V-er, after identifying the affix-*er* and acquiring compound word order.

However, the above analysis does not explain all the patterns of errors made in the process of acquisition of synthetic compounds. It is suggested in Clark, Hecht and Mulford (1986:21) that the use of bare verbs as the modifier of compound nouns (i.e. V-MAN or V-THING) is a result of "an extension in the set of possible modifiers in compound nouns," but the reason for such an extension is not given. The reason why the other patterns of errors such as V+O, V+O+MAN or V+O+THING were made by children is not given, either.

5.3.2 Discussion

Under the dynamic approach, the phenomena discussed in the previous subsection can be explained in the following way. Suppose that children have already acquired how to form a root compound, but not how to form a word with an affix, let alone how to form a synthetic compound. Suppose further that those children are asked to give a name to "someone who pulls wagons," and is then given the four different options.

One of the options is to use the structure of a root compound as in *wagon-man*. In this case, the semantic relation between *wagon* and *man* (i.e. the meaning of the predicate PULL (X)) is not expressed in form and it must be interpreted contextually.

The second option is to use the structure of a root compound as in *pull-man*, a novel compound created by placing a verb in the non-head position of a primary compound. In this case, children express the predicate meaning, rather than the internal argument as in the first option. We may say that V-MAN compounds are derived from root compounds through the extension of the possible items in the non-head positions.

The third and fourth options are to express the meaning of the predicate with its internal argument, PULL (WAGON). The third option is to create novel compounds by placing a verb phrase in the non-head position of a root compound, as in *pull-wagon-man*. We may say that V-O-MAN compounds, as well as V-MAN compounds, are derived from root compounds by extending the possible items in the non-head positions. The fourth option is to use the syntactic structure of a verb phrase, as in *pull-wagon*.⁹

Common to all the errors is that they are used to resolve a conflict between form and meaning. Children who cannot form synthetic compounds create various types of compounds by extending the rules made available in the grammar at that stage, when they would like to express a complex concept (the agent of action) which is ordinarily carried by a verb phrase and which cannot be conveyed by a simple word but which nevertheless corresponds to a non-specific, coherent semantic unit and can be conveyed by a compound.

After acquiring how to form deverbal nouns with the affix *-er*, children

⁹ A precondition for the use of a novel compound like *pull-wagon* is that the predicate-argument structure in semantics has already been associated with the verb-object order in syntax. See Brown (1973:173).

can use them in compounds. Those children can freely form a deverbal noun such as *puller* but still do not know in which position the argument of a base verb should be placed in compounds. Thus, they still use the word order of a verb phrase made available in a syntactic structure and form a compound as in *puller-wagon*.

None of these errors stay in children's grammar for long, since adult grammar does not provide supporting evidence for these errors. Since the form of O-V-*er* is frequently used by adults, children eventually switch to this form.

5.4. Typological Variation

Given that phrasal compounds are derived from ordinary compounds through the extension of the types of possible items in the non-head position, we can predict the following typological variation: (A) languages which have rules generating ordinary compounds allow phrasal compounds, while languages which do not have rules generating ordinary compounds do not allow phrasal compounds; (B) languages which have rules generating different types of ordinary compounds allow different types of phrasal compounds. In what follows, I will look at examples which are compatible with these predictions.

5.4.1 Prediction (A)

Let us first look at examples which are compatible with prediction (A). Germanic languages such as English, German, Dutch and Afrikaans have rules generating ordinary compounds, and often use compounds in forming

new words. In these languages, we find phrasal compounds like (5.15)-(5.17)¹⁰.

(5.15) German:

- a. der Frauen-sind-gefährlich-Glaube
'the women-are-dangerous belief'
- b. das Oh-was-ist-das-für-eine-schlechte-Welt-Gesicht
'the what-a-bad-world-this-is face'
- c. sein komm-sofort-her-Ausdruck
'his come-immediately-here face'

(5.16) Dutch:

- a. lach of ik schiet humor
'laugh or I shoot humor'
- b. blijf van mijn lijf huis
'stay off my body house' (i.e., shelter for abused women)

(5.17) Afrikaans:

- a. Charles en Di sindroom
'Charles and Di syndrome'
- b. op'n ry neste
'in a row nests'
- c. vies vir die wêreld uitdrukking
'cross for the world expression'

¹⁰ I would like to thank Yasuhito Hosaka and Walter Ruprecht for the examples in (5.15). The examples in (5.16) and (5.17) come from Lieber (1992:11), where they were cited from Hoeksema (1988) and Savini (1983).

- d. God is dood theologie
'god is dead theology'

In contrast, Romance languages such as French do not have rules generating ordinary compounds, and hence do not allow phrasal compounds. Interestingly, while these languages do not allow phrasal compounds, they have a lot of syntactic words (cf. Di Sciullo and Williams 1987, Zwanenburg 1992, Picone 1992). In French, there are a lot of nouns which are reanalyzed from phrases such as NP, VP, and AP as in (5.18)-(5.20).

(5.18) NP

- a. coffre-fort
box strong 'safe'
- b. arc-en-ciel
arch in sky 'rainbow'

(5.19) VP

- a. essuie-glace
wipe glass 'screen wiper'
- b. gagne-petit
gain little 'poorly paid person'
- c. couche-tard
put-to-bed late 'night-reveller'

(5.20) AP

bons-à-rien

good for nothing

Recall here that English-speaking children at an earlier stage of acquisition use the structure of verb phrases in order to express the agent of action which is ordinarily carried by compound nouns in adult English. For instance, children produce an expression like *pull-wagon* instead of *wagon-puller*. These expressions seem to correspond to syntactic words like (5.19) found in Romance languages. Common to both an early child English grammar and adult Romance languages is that they do not have rules generating compounds which express the agent of an action. Considering these facts, we may say that syntactic words are used when it is necessary to express a complex concept which is ordinarily carried by an XP and which cannot be conveyed by a simple word but which nevertheless corresponds to a non-specific, coherent semantic unit and can be conveyed by a word. Syntactic words found in Romance languages as well as phrasal compounds found in Germanic languages serve to resolve a conflict between form and meaning.

5.4.2 Prediction (B)

Let us next look at examples which suggest that prediction (B) is correct. The examples that I consider here are what are called Verb Raising constructions and Verb Projection Raising constructions. According to Haegeman and Riemsdijk (1986), Verb Raising (VR) is a type of clause union

that affects the verb of a nonfinite complement clause and incorporates it into a certain matrix verb. As a consequence, the embedded verb is incorporated into the matrix verb to form a verb cluster. Such a construction is seen in German and Dutch. A German example is given in (5.22a) and a Dutch example is given in (5.22b).

(5.22) a. ... dass er das Problem *zu begreifen* versucht

that he the problem to understand tries

'that he tries to understand the problem'

b. ... dat hij het probleem probeert *te begrijpen*

that he the problem tries to understand

(Haegeman and Riemsdijk 1986:1-2)

As we see from the contrast between (5.22a) and (5.22b), the embedded verb in italics is extracted from the complement clause and adjoined to the underlined matrix verb --- to its left in German and to its right in Dutch, which is schematically represented in (5.23) ¹¹.

¹¹ According to Haegeman and Riemsdijk (1986:418), there are a variety of criteria which show that a process of clause union is at work in German, even though its effect is not visible in the order of the verbs. One such criterion, for instance, is that object clitics of the embedded verb may move to the position preceding the matrix subject in verb-raising contexts, as in (i).

(i) dass esi der Hans ti zu begreifen versucht
that it (the) Hans to understand tries

(5.23) VR

... V₁]_{IP} V₂ ...

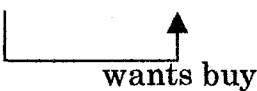
a. ... t₁] [V₁ V₂]_V ... (German)

b. ... t₁] [V₂ V₁]_V ... (Dutch)

Verb Projection Raising (VPR) is a variant of the VR construction. In the VPR construction, the part of the embedded clause affected is not just the verb but some projection of it, i.e. V' or VP. As a consequence, the embedded verb phrase is incorporated into the matrix verb to form a verb cluster. These constructions can be observed in only several varieties of Belgian Dutch (Flemish) and Swiss German. Specifically, they can be seen in West-Flemish (WF), the dialect of Belgian Dutch, and Zuritüütsch (ZT), the dialect of Swiss German, but not in Standard Dutch (SD). Examples from each language are given in (5.24)-(5.26) ((5.24): SD, (5.25): WF, and (5.26): ZT).

(5.24)a. dat Jan [PRO [een huis t]_{VP}]_{IP} wil *kopen* (VR)

that Jan a house wants buy



b. *dat Jan [PRO [t]_{VP}]_{IP} wil *een huis kopen* (VPR)

that Jan wants a house buy



(5.25)a. da Jan [PRO [een hust t]_{VP}]_{IP} wilt *kopen* (VR)

b. da Jan [PRO [t]_{VP}]_{IP} wilt *een hus kopen* (VPR)



(5.26)a. das de Hans [PRO [es huus t]_{VP}]_{IP} wil *chaufe* (VR)

b. das de Hans [PRO [t]_{VP}]_{IP} wil *es huus chaufe* (VPR)

The diagram for (5.26)b shows the sentence "das de Hans [PRO [t]_{VP}]_{IP} wil *es huus chaufe*". A horizontal line with an upward-pointing arrow is drawn above the words "es huus", indicating their movement from the embedded VP to the matrix VP. A second horizontal line with an upward-pointing arrow is drawn below the words "es huus", indicating their movement from the matrix VP to the IP level.

The detailed analysis of these constructions is beyond the scope of this study. Let us here concentrate on verb clusters formed in VR and VPR. In VR constructions, the embedded verb is incorporated into the matrix verb to form a compound verb of the form V-V. In VPR constructions, on the other hand, the embedded verb phrase is incorporated into the matrix verb to form a compound verb of the form VP-V or V-VP. The latter type of compound verb is an instance of a phrasal compound. WF and ZT, but not SD thus have phrasal compounds with a verb head. The important point here is that WF and ZT also have the corresponding ordinary compounds (V-V compound). We may say that languages which have VR (rules generative V-V compounds) may allow VPR (rules generating VP-V compounds). This contrasts with the case of English, in which neither VR nor VPR is allowed. We may say that the languages which have VR may allow VPR, while the languages which do not have VR never allow VPR. This is compatible with prediction (B). Table 5-2 summarizes the discussion so far.

Table 5-2

	WF	ZT	SD	English
VR	+	+	+	-
VPR	+	+	-	-

(the symbol "+" indicates that VR or VPR is allowed in the language in question).

CHAPTER VI

CONCLUSION

In this study, I examined the properties of phrasal compounds and attempted to explain their properties, along with the following facts concerning phrasal compounds shown in Chapter I: (i) phrasal compounds share properties with ordinary compounds; (ii) phrasal compounds are more marked than ordinary compounds; and (iii) phrasal compounds are attested in many languages.

In Chapters II and III, I examined the properties of phrasal compounds in English and in Japanese, and pointed out the similarities and differences between the two languages. In both languages, phrases appearing in the non-head position of a phrasal compound are restricted in the following way: (i) non-head nouns cannot include either demonstratives or deictics; (ii) non-head nouns cannot include degree words; and (iii) IP and CP which constitute a phrasal compound are restricted to quoted expressions. With respect to the head, each language has a different set of possible categories of words which constitute phrasal compounds. In English, the categories which may occupy the head position of a phrasal compound are nouns as in *the* $[[\textit{save-the-homeless}]_{\text{IP}} [\textit{campaign}]_{\text{N}}]_{\text{N}}$ and adjectives as in $[[\textit{cold weather}]_{\text{NP}} [\textit{cozy}]_{\text{A}}]_{\text{A}}$. In Japanese, on the other hand, phrasal compounds with a noun head are frequently used as in $[[\textit{sumai-no oteire}]_{\text{NP}} [\textit{kyousitu}]_{\text{N}}]_{\text{N}}$ 'maintenance-of-a-house lecture' but those with an adjective head are virtually impossible as in $*[[\textit{aoosita kusa}]_{\text{NP}} [\textit{bukai}]_{\text{A}}]_{\text{A}}$ 'lush-green-grass

deep' (cf. *kusa-bukai* 'grass-deep (= grassy)). Common to both languages is the fact that there is a correlation between actual ordinary compounds and possible phrasal compounds; categories of words which productively form ordinary compounds are more likely to constitute phrasal compounds.

In order to examine whether the properties of phrasal compounds can be explained in the frameworks that have already been proposed, I reviewed three major theoretically different approaches to word formation: (A) the lexicalist approach (Selkirk 1982, Di Sciullo and Williams 1987), (B) the syntactic approach (Lieber 1992), and (C) the modular approach (Shibatani and Kageyama 1988). Approach (A) claims that word formation applies in the lexicon; Approach (B) claims that word formation applies in syntax; and Approach (C) claims that word formation applies in any or all components of grammar, but that the rules and principles of morphology constitute their own module and determine the well-formedness of word structures. Under each of these approaches, various analyses of phrasal compounds have been proposed. However, none of the previous analyses explained the properties of phrasal compounds adequately. These analyses all assume a Chomskyan generative framework, which defines the notion of 'possible grammars' solely in terms of characteristics of adult grammars without reference to any grammar at the non-final stage of language acquisition.

In Chapter V, I proposed an alternative analysis of phrasal compounds within the Dynamic Theories of Language (DTL), which have been developed in Kajita (1977, 1997). The basic tenet of DTL is that the grammars of the non-final stages of language acquisition play an important role in explaining both the uniformity and diversity of the final stage of grammars (adult

grammars), and the course of language development. Suppose children who can form ordinary compounds have acquired rules for generating ordinary compounds by applying to the primary linguistic data the following universal principles proposed in DTL: (i) ASSOCIATE a form and a meaning; (ii) ANALYZE form-meaning associations; (iii) CATEGORIZE form-meaning associations. Those children may create phrasal compounds by placing XP in the non-head position of ordinary compounds, when they feel a need to express a complex concept which is ordinarily carried by an XP and which cannot be conveyed by a simple word but which nevertheless corresponds to a non-specific, coherent semantic unit and can be conveyed by a compound. In this sense, phrasal compounds are derived from ordinary compounds through the extension of the types of possible items in the non-head position. Phrasal compounds serve to resolve the conflict between form and meaning.

The analysis presented above only explained the properties of phrasal compounds, but also gave a principled and unified account of various phenomena concerning language acquisition and cross-linguistic variation. With respect to language acquisition, different patterns of errors made in the process of acquisition of English synthetic compounds investigated by Clark and her colleagues were explained in the following way. Suppose that children have already acquired how to form root compounds, but not synthetic compounds such as *wagon-puller*. Those children may create a new compound structure by placing a verb or verb phrase in the non-head position of root compounds as in *pull-man* and *pull-wagon man*, when they would like to express a complex concept ('a person who pulls wagon') which is ordinarily carried by a verb phrase and which cannot be conveyed by a

simple word but which nevertheless corresponds to a non-specific, coherent semantic unit and can be conveyed by a compound.

Furthermore, with respect to cross-linguistic variation, the following was explained. (A) Germanic languages, which have rules generating ordinary compounds, allow phrasal compounds, while Romance languages, which do not have rules generating ordinary compounds, never allow phrasal compounds; (B) languages which have Verb Raising Constructions (VR) do or do not allow Verb Projection Raising (VPR), but languages which do not allow VR never allow VPR. In relation to (B), I also argued that Romance languages, which do not have rules generating compounds, often use syntactic words, and that syntactic words, as well as phrasal compounds found in Germanic languages serve to resolve a conflict between form and meaning.

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