VERBAL COMPOUNDS IN JAPANESE:  
IMPLICATIONS FOR MORPHOLOGICAL THEORY

by

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ABSTRACT

A number of past studies on verbal compounds show the asymmetry between subjects (external arguments) and non-subjects (internal arguments). The same type of asymmetry between subjects and non-subjects has been observed and well-known (though, see Bresnan 1983) in syntax. Several linguists, such as Roeper and Siegel (1978), Selkirk (1982) and Lieber (1983), have proposed an independent principle to account for this asymmetry. In this thesis, an attempt is made to show such a principle is unnecessary. Moreover, it is argued that the existing syntactic principle can be extended to cover the domain of morphology. Once the above proposal is shown to be a desirable and plausible move, then other aspects of morphology, namely, a theory of percolation, can be reduced to bare minimal - 'Percolate freely'.

The problematic case of V-V compounds in the previous theories is resolved, again, by adopting the proposal made for syntactic co-ordinate structure three-dimensional representation.
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"a new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die and a new generation grows up that is familiar with it"

The Planck Principle

"Montaigne remarked that no one is exempt from talking nonsense: the misfortune is to do it solemnly. I shall therefore avoid being solemn in the hope that no argument need be entirely useless—even the worst one might serve a didactic purpose and be cited as wrong or invalid"

Wolfgang Yourgrau
CHAPTER 1

Introduction

Since the publication of Roeper and Siegel’s (1978) important work, "A Lexical Transformation for Verbal Compounds", linguists such as Selkirk (1982), Pesetsky (1982) and Lieber (1983) have tried to reduce the First Sister Principle to capture the similarity between syntactic and morphological asymmetries of subjects and non-subjects. In this thesis, the proposals made by these linguists will be examined critically, and an attempt is made to capture the similarities observed by the previous researchers by extending some of the syntactic principles to the domain of morphology.

In the first three sections of Chapter 2, three proposed accounts for verbal compounds will be examined. Selkirk (1982) takes such notions as 'subject-of' and 'object-of' as primitives in her theory and proposes a principle to constrain verbal compounds using these primitives. Pesetsky (1982) re-examines Selkirk’s proposal and translates it into Government-Binding theory in which grammatical relations are taken to be non-primitives, i.e. derivable from other primitives in the theory. Lieber (1983) proposes another different approach in which an independent, additional principle constrains the formation of verbal compounds.

The last three sections of Chapter 2 will examine three different representations of predicate argument structure - Williams (1981 & 1985), Marantz (1984) and Farmer (1984) and the consequences of these proposals for verbal compounds.

Chapter 3 contains an outline of a model which synthesizes the previous proposals. It also contains a new approach to the verbal compounds which in the previous approaches have been shown to be problematic.
CHAPTER 2

2.1.1. A Sketch of Selkirk's Theory of Word Formation

Selkirk observes that "word structure has the same general formal properties as syntactic structure and moreover, that it is generated by the same sort of rule system" (p.2).

The morphological structure Selkirk proposes differs significantly from that of Lieber (1980) (see Section 3 below). Selkirk's conception of the morphological component is illustrated in (2-1):

(2-1)

![Diagram of Extended Dictionary](image)

The Dictionary component contains "a list of freely occurring lexical items (words)". The list of bound morphemes has a separate component. Together they constitute the Extended Dictionary. A set of word structure rules defines "the possible morphological structures of a language". These are the subcomponents that form "the core of the word structure component".

The main objective of Selkirk's monograph is to show that word structure rules are context-free in the same sense as the \( \lambda \) theory of syntax. She proposes the following rules for generating the word struc-
tures of language:

\[(2-2)\]

\[\chi^n \rightarrow \chi^m \gamma^p\]
\[\chi^n \rightarrow \gamma^p \chi^m\]

where \(0 \geq n \geq m,p\)

For compounds, Selkirk argues that the constituents of the English compound are of the category type Word. Thus, she proposes the following rules for generating English compounds:

\[(2-3)\]

\[X \rightarrow Y X\]

where \(X\) stands for \(\text{Word; Noun, Verb,...}\) and \(Y\) stands for \(\text{Word; Noun, Verb,...}\)

Coupled with the above general schema to generate English compounds, she suggests, adopting the Lexical Functional Grammar, the following condition:

\[(2-4)\]

The First Order Projection Condition (FOPC). All non-SUBJ arguments of a lexical category \(X_i\) must be satisfied within the first order projection of \(X_i\).

(1982:37)

The definition of the "first order projection" is given below:

\[(2-5)\]

The first order projection (FOP) of a category \(X^n_i\) is the category \(X^m_i\) that immediately dominates \(X^n_i\) is syntactic representation (i.e.,) in either S-syntactic or W-syntactic structure.

What this means, Selkirk explains, is that "the non-SUBJ arguments of an item must be 'locally' satisfied, indeed, must be sisters to that item."

(1982:p.38) For example,
Correspondingly, the argument structures of 'eat' and 'devour' are shown in (2-7) and (2-8):

(2-7)

a. eat: \((\text{AGENT}, \text{THEME})\)
   \[\text{SUBJ} \quad \text{OBJ}/\emptyset\]

b. eating: \((\text{AGENT}, \text{THEME})\)
   \[\text{SUBJ}/\emptyset \quad \text{OBJ}/\emptyset\]

(2-8)

a. devour: \((\text{AGENT}, \text{THEME})\)
   \[\text{SUBJ} \quad \text{OBJ}\]

b. devouring: \((\text{AGENT}, \text{THEME})\)
   \[\text{SUBJ}/\emptyset \quad \text{OBJ}\]

The difference between 'eating' and 'devouring' is that the latter cannot participate in a compound in which the first stem cannot be interpreted as an OBJ. Whereas 'eating' can appear with a Locative, as in 'restaurant-eating' and 'roof-top-eating' \(^1\), 'devour' cannot.

In Japanese, for example, 'de-bune' (=departing boat) has the following structure within Selkirk's system:

(2-9)

a. \(N\)

\[\text{V} \quad \text{N}\]

b. de: \((\text{THEME})\)

\[\text{SUBJ}\]

de bune

It is reasonable to assume that the head is located on the right-hand side.
Selkirk observes that "the verb or deverbal element on the left (in nonhead position) may not satisfy its argument structure with its sister (the head)" (1982:25). The relation that the head appears to have to the verb or deverbal element in the nonhead position can pragmatically determined. Selkirk claims that "...word structure is thus entirely parallel to syntactic structure, where the head of a phrase may have its arguments satisfied by its complement(s), but not vice versa" (1982:25). Note that if compounds of the form [V N]N, as in (2-9), were subject to the First Order Projection Condition, then all of these compounds would be ruled out since the node 'V' would be the first order projection and all non-SUBJ must be satisfied within that 'V'.

Since the FOPC applies to any lexical item that has arguments and does not specify whether that lexical item is head or not, it is, in principle, necessarily the case the FOPC applies to those compounds having one configuration (2-9).

Now, the Japanese data that are of interest in considering Selkirk's theory are presented below:

(2-10)

a. uta - utai 'song' 'to sing'
   'singer'

b. hana - mi 'flower' 'to look/watch'
   'flower-appreciation'

c. mondo - huki 'window' 'to clean'
   'window-washer'

There are two possible structures that the theory permits:
Selkirk suggests that for a compound to have a configuration such as the one in (2-11b), it must be shown that some rule refers to the subcomponent of the compound, namely, [ [ ] [ ] ], which behaves as a constituent. Furthermore, there should be examples of zero-formation independently of compounds.

Note that if the structure (2-11a) is chosen, Selkirk will be forced to say the verbal/deverbal compounds in Japanese are NOT constrained by the FOPC at all. Since the examples in (2-10) are grammatical and since, according to the FOPC, the V is the first order projection of the verb, its arguments must be satisfied within that V.

There are indeed words such as 'hanası = "story" (verb hanas- "to speak")', 'hasirı = "run" (verb hasir- = "to run")', 'nokorı = "remainder" (verb nokor- = "to remain")', etc. Thus, independently of compounds there needs to be a rule of the form N → V.

Note that the final vowel, /i/, in these examples is not a nominalizer but it is a reflex of an independently motivated epenthetic vowel. Traditionally, (cf. J. McCawley, 1968), the Japanese verbs are grouped into two distinct classes at the underlying level: (1) the consonant final verbs (henceforth C-verbs) and (2) the vowel-final verbs. What is of interest and of relevance here is the C-verbs. When a consonant-initial level II affix or stem follows the C-verb, that is, in the environments [...]C [...]
or \([\ldots C][C\ldots]\), the epenthetic vowel, /i/, is inserted. What causes this epenthesis is that the Japanese syllabic template does not tolerate consonant clusters. We assume, following Grignon (1983), that Japanese has the following syllable template:

(2-13) The Japanese Syllable Template

\[
\begin{array}{c|c}
\text{ONSET} & \text{RIME} \\
\hline
\text{X} & \text{Nucleus} \\
\hline
\text{C} & \text{V (V/n)} \\
\end{array}
\]

Thus, when the C-verbs are inserted into either \([\ldots C][C\ldots]\) or \([\ldots C][C\ldots]\) frames at Level II, the epenthetic vowel, /i/, is inserted to break up the offensive clusters.

If, on the other hand, this vowel, /i/, is treated as a nominalizer, not only will we lose a significant phonological generalization, but it will become necessary to add another word formation rule, namely, zero derivation to account for examples such as in (2-14).

(2-14)

\[
\begin{align*}
\text{v} \\
a. \text{sosetsu-o kaki - tai desiderative} \\
& \text{v 'novel' ACC, 'write' DESID.} \\
b. \text{sosetsu-o kaki - nagara 'while writing a} \\
& \text{v 'while-ing' novel...'} \\
c. \text{sosetsu-o kaki - kaketa 'about to write a} \\
& \text{v 'about to' novel...'}
\end{align*}
\]

There will be at least two possible structures any morphological theory can assign to each of the examples in (2-14): (i) \([[\text{kaki}]i]0\); (ii) \(v n v\)
[kaki]. On the other hand, it may be the case that the subcategorization frames of the suffixes have to be complicated, e.g., (i) - tai = \([[[v]_n] \_\]

Thus, the final vowel of the stems ending with consonants is treated as an epenthetic vowel.

The former requirement, though, is not met with \([N V]_v\) compounds, i.e., the \([N V]_v\) compound does not behave as a verb. However, there are numerous examples of nominalized \([[[V V]]]\) compounds that do indeed behave like verbs. Let me clarify the last remark with examples:

(2-15)

a. hiki - dasi 'drawer' 'to pull' 'to take out'

b. tabe - nokosi 'scrap of food' 'to eat' 'to leave'

c. iki - nokori 'survivor' 'to live' 'to remain'

d. oshi - ire 'closet' 'to push' 'to put into'

Both stems in these compounds are independent verbs, having word status. These can have two possible structures:

(2-16)

\[
\begin{array}{c}
\text{N} \\
\text{V} \\
\text{V}
\end{array}
\begin{array}{c}
\text{V} \\
\text{V}
\end{array}
\begin{array}{c}
\text{V} \\
\text{V}
\end{array}
\]

For these compounds, the structure must be (2-16ii), since the subcomponent of the compound, i.e., \([ [] [[ ]] \] \_\), seems to participate in regular inflection as in (2-17):
If the exocentric structure (2-16ii) were the structure for these [VV] compounds, we would need extra machinery to account for the behavior of these non-nominalized verbal compounds.

Thus, there is an independent necessity for a re-writing rule N,--> V.

Returning to the examples in (2-10), they have the following structure when the verb is transitive:

(2-18)

Now, the same problem will arise in Lieber's model in section 2.3 with [VV]vN compounds where both stems have (obligatory) non-SUBJ arguments, e.g. 'tabe-nokosi':
According to the FOPC, this structure should be ruled out: The obligatory non-SUBJ argument, THEME, in both verbs, cannot be satisfied within the FOP of the compound.

2.2 Pesetsky’s (1983) Approach to Compounds

Having reviewed Selkirk’s (1982) generalization, Pesetsky proposes that the 8-Criterion accounts for the compounds that involve argument-taking stems. Pesetsky’s claim is that if the positional aspect of the 8-Criterion is satisfied, then in compounds, an available 8-role must be assigned to that position.

The version of the 8-Criterion Pesetsky adopts is the one in Chomsky (1981):

(2-20)

"If a structural position that can be 8-marked is obligatory, then it is obligatorily 8-marked by an element that may 8-mark it; if such a position is only optionally present, then 8-marking of this position is correspondingly optional, and will apply just so as to satisfy the 8-Criterion"

(Chomsky 1981, p.40)

Coupled with the government requirements on 8-marking, Pesetsky observes that "...where V is ultimately responsible for assignment of a 8-role, the argument that receives that role is sister to some projection of V (p.35)".

Given the above, Pesetsky derives Selkirk’s generalization in the
following way:

(2-21)

a. pasta-eating in trees  
b. *tree-eating of pasta

In (2-21a), 'pasta' in a compound receives a 0-role, THEME, from 'eat'. 'Trees', on the other hand, receives its 0-role, LOCATIVE, from 'in'. The 0-Criterion is satisfied.

In (2-21b) 'tree' in the compound is 0-marked, THEME, by 'eat'. However, 'pasta' cannot receive any 0-role either from 'eat' or from 'of'. The 0-Criterion is violated.

Are both 'pasta' in (2-21a) and 'tree' in (2-21a) actually in the appropriate position to satisfy the 0-Criterion? In other words, is the nominal in the compound such as 'pasta-eating' and 'tree-eating' sister to the verb, 'eat'?

The answer, according to Pesetsky, is "Yes". Pesetsky assumes (i) that "the process of morphological conversion (or zero derivation) changes lexical item of Class N into items of Class 0 and (ii) that affixes such as /-ing/ undergo a QR-like rule in LF". Thus, at S-Structure, a compound like 'tree-eating' has the following representation:

(2-22)

```
  N
 / \  
tree   N
  /   
V
 /  
eat   ing
```

This structure is converted to (2-23) at LF by a QR-like rule 2,3:
The trace left by /-ing/, by stipulation, is of category 0, thus, the subcategorization requirement of /-ing/ is satisfied even after the QR-like rule has applied. Notice that 'tree' is now sister to 'V'. The positional requirement of the θ-Criterion is satisfied. The θ-Criterion sanctions the verb to θ-mark 'tree'.

Pesetsky goes on to claim that another generalization made by Selkirk (1982) supports the existence of affixal traces. Selkirk's generalization is that while non-SUBJ arguments can appear in compounds with argument-taking items, SUBJ arguments can never appear in compounds. Pesetsky gives the following examples:

(2-24)

a. N1

  dog  N2

  v3

  bark  ing

b. N0

  v1  ing1

  v2

  dog  v3

  bark  ei

- 12 -
The affixal traces, as shown by Pesetsky (1983:29), have the properties of an anaphor. Thus, "if 'dog' is a subject of 'bark' (being an external argument), then the trace in (2-24b) is free in the domain of a subject, and violates Principle A of the Binding Theory (here, the Specified Subject Condition)" (1983:36).

How would Pesetsky account for the Japanese [VV] compounds? If we continued to assume the structure shown in the preceding sections, then clearly, there is nothing Pesetsky could say about it. Suppose in Japanese, the first member of a compound undergoes zero-derivation as Pesetsky proposed for nouns in English. This will yield, for example, the following structure for 'tabe-nokosi' at S-structure:

(2-25) a.

```
  N1
    /\   \
   /   \  
  tabe  N2
       /   \
      /     \ 
     /       \ 
    V        0
   /         \
  nokosi    
```

Subsequently, the zero morpheme is adjoined to the N1 at LF. The result of this operation is (2-25b):
Now, the verb 'nokos-' 8-marks 'tabe'. The obligatory argument of 'nokos-' is satisfied.

However, this is a very disturbing analysis. Why should any class of lexical items undergo this "process of morphological conversion" to become categoriless? Pesetsky's claim that since the category of the whole compound is determined by the second member, the first member of the compound has the properties of prefixes such as the categoriless /counter-/, does not necessarily motivate a process of morphological conversion. Since Pesetsky states that the structure like (2-21) 'tree-eating' is fed into LF, we can safely assume in the lexicon this process of morphological conversion has taken place. Furthermore, since he assumes the framework of Lexical Phonology and Morphology such as the one proposed by Kiparsky (1981), the structure must have the stress and prominence already encoded. Let us see if this is the case.

Given the structure like (2-21), the English Compound rule, for example by Hayes (1982), does not apply. The result is an ungrammatical form as in (2-26)
Instead, the compound has its main stress on the first member, tree-eating.

In Japanese, if it is the case that the first member of the [VV] compound must undergo a process of morphological conversion, then what happens to its argument structure? This claim cannot be maintained since if 'tabe' in 'tabe-nokosi' is assigned a θ-role then the following should be ruled out by the θ-Criterion but it is perfectly grammatical:

(2-27)

\[
\text{tabe-nokosi no okasi ga ar-u.}
\]

'scraps of food' GEN. 'sweets' NOM. 'exists-NOM-PAST'

"There are left-over sweets"

If 'tabe' had undergone zero derivation, received a θ-role from 'nokos-', then 'okasi' could not be interpreted as a THEME-argument of 'tabe-nokosi'.
2.3. Lieber's Approach to Compounds

2.3.1 A Sketch of Lieber's Theory of Morphological Component and Argument-linking Principle

As a point of departure, Lieber (1983) takes the morphological structure proposed in her doctoral thesis (1980)). Her conception of a morphological component in generative grammar consists of three sub-components: (i) a permanent lexicon which contains lexical entries, morpholexial rules and redundancy relations; (ii) a lexical structure component which consists of unlabeled binary branching trees plus the Percolation Conventions; and (iii) a string dependent rule component which contains rules of reduplication, infixation, etc. Schematically, Lieber's (1980) model of morphology is illustrated as below:

```
PERMANENT LEXICON

CATEGORY: N    CATEGORY: V    CATEGORY: A

v

LEXICAL STRUCTURE

- Lexical Structure Rewrite Rule
- Feature Percolation Conventions

v

STRING DEPENDENT RULES

- Reduplication
- Infixing
- Umlaut
  etc.
```

As with Allen (1978) and Pesetsky (1983), Lieber takes lexical seman-
tics to be autonomous. That is, contrary to the Aronovian framework in which morphological rules have access to semantic contents of morphemes, within Lieber's model the only information that the morphological rules can refer to is categorial. Thus, whereas Aronoff's model does not ever generate such semantically anomalous words as 'rekill' and 'unkill', Lieber's model is permitted to generate words that may have a conflict in some semantic feature specifications of affix and stem. What Lieber's model does not allow morphological rules to do is to violate the subcategorization of affix. All affixes have in their lexical entries the categories to which they attach. Stems have no such information in their lexical entries. The term 'subcategorization' here refers only to morphological subcategorization frames, not to syntactic subcategorization frames such as the ones proposed by Chomsky (1965) for verbs.

The claim that lexical semantics is autonomous - i.e., separate from morphology - has several advantages over the one that mixes these two. Lieber argues that the autonomy of lexical semantics accounts for (1) the difference in 'grammaticality' between the two sorts of case - 'rekill' and 'unkill' on the one hand, 'unpeace' and 'refusity' on the other: the former is the semantic ungrammaticality and the latter the structural/subcategorizational ungrammaticality; (2) the structurally compositional but semantically non-compositional characteristics of such compounds as 'paleface', 'recap' and 'blackboard'.

Lieber postulates two autonomous sets of semantic projection rules: one for compositional lexical semantics and another of non-compositional lexical semantics. In her (1980) thesis, she states, "What a theory of lexical semantics should look like, what sorts of rules are needed, and what sorts of constraints must be placed on rules of lexical semantics are questions which must be answered if we accept the autonomy of lexical
semanctics, but they are questions which I cannot answer here."

2.3.2 Lieber's (1983) "Argument-linking Principle":

In Lieber (1983), "Argument-linking and Compounds in English", she observes that a number of current theories of syntax rule out the overgenerated sentences such as (2-28a-c) by an independent principle 'requiring that lexical items which have argument structures must be able to satisfy those argument structures in any tree into which they are inserted (p.257).'

(2-28)

a. * John put.

b. * The magician appeared the rabbit.

c. * Mary likes.

Although, Lieber does not explicitly state the principles, I will assume that the θ-Criterion and the Projection Principle of Government-Binding (GB) theory (Chomsky, 1981 & 1982) or the Completeness Principle and the Coherence Principle of Lexical Functional Grammar (Bresnan, 1982 and Kaplan & Bresnan, 1982) are the principles which she refers to in her article. Since both GB theory and LFG prohibit any syntactic rule from altering the argument structures but permit lexical rules to affect the argument structures, it is of theoretical interest to determine the limitation of these argument-structure-affecting rules. Lieber's Argument-linking Principles makes such an attempt with compounds in English.

Lieber (1983) assumes the following four axioms:

(2-29)

I. Feature Percolation Conventions

a. Convention 1

All features of a stem morpheme, including category features, percolate to the first non-branching node dominating that morpheme.
b. Convention 2

All features of an affix morpheme, including category features, percolate to the first branching node dominating that morpheme.

c. Convention 3

If a branching node fails to obtain features by Convention 2, features from the next lowest labeled node automatically percolate up to the unlabeled branching node.

d. Convention 4

If two stems are sisters (i.e., they form a compound), features from the right-hand stem percolate up to the branching node dominating the stems.

II. Internal argument

In the sense of Williams (1980), all obligatory (i.e., lexically specified) arguments with the exception of the subject are internal. For example, give and elect have two internal arguments; put has both an NP and Locative as internal arguments; and a preposition like during has one internal argument.

III. Semantic argument

Semantic arguments are phrases which are not obligatory or lexically specified. They include Locative, Instrumentals, Manner phrases, Benefactives, Agentives, etc.

IV. FREE

A stem is free if it is left unlinked by an argument-taking lexical item.

(Lieber, 1983:253-7)

Once these assumptions are explicitly defined, Liebers presents the argument-linking Principle:

(2-30)

The Argument-linking Principle

a. In the configuration [ ] [ ] or [ ] [ ], where \( \alpha \) ranges over all categories \( \{V\} \), \( \alpha \) must be able to link all internal arguments.

b. If a stem is free in a compound which also contains an argument-taking stem, \( \alpha \) must be interpretable as a semantic argument of the argument-taking stem, i.e., as a Locative,
Manner, Agentive, Instrumental or Benefactive argument.

The first part (2-30a) defines the structural requirement in which all internal arguments must be satisfied. In syntax, it is in the structure (2-31a) and in Morphology, it is in the structure (2-31b):

(2-31)

\[
\begin{align*}
&\text{a. } \text{V/P NP} \\
&\text{b. } \alpha
\end{align*}
\]

For example, in syntax

(2-32)

\[
\begin{align*}
&\text{a. VP} \\
&\text{b. PP}
\end{align*}
\]

'HIT': (Patient\textsubscript{i})

'FOR': (Benefactive\textsubscript{i})

The internal argument of 'HIT' and 'FOR', Patient and Benefactive, respectively, are linked with the sisters of the argument-taking lexical items, V and P. (Here, the linking is shown by indices). An example of a compound as analyzed by the Argument-linking Principle is given in (2-33)^4.
By Convention 4, only the features of the right-hand stem percolate up to the branching node. The Argument-linking Principle requires that the internal argument, Theme, must be satisfied within the compound.

On the other hand, in compounds like 'hand-weave', the second stem 'weave', does not necessarily have to satisfy its internal argument within the compound, since all the features of 'weave' are permitted to percolate up to the highest node:

2.3.3. Japanese Data

At first glance, there seem to be 3 types of verbal compounds in Japanese: (i) [V N]N; (ii) [N V]V; (iii)[X V]N. In this section these
sets of verbal compounds will be analyzed within Lieber's model. It will be revealed that the Argument-linking Principle fails to account for one type of verbal compounds, namely, \([V V]N\) compounds.

2.3.2.1 \([\text{Verb-Noun}]\text{NOUN}\) Compounds

These are the compounds that have the internal constituents \([\text{Verb Noun}]\) which behave as a noun. The simplest analysis of this sort of compounds takes the features of the right-hand stem percolating up to the uppermost node. Thus, creating a configuration illustrated below:

\[
\begin{array}{c}
N \\
\downarrow \\
V \quad N \\
\downarrow \\
[ ] \\
\quad \quad V \\
\quad \quad [ ] \\
\quad \quad N
\end{array}
\]

This group must then adhere to the Argument-linking Principle. The examples of this group are such as the ones in (2-36):

\[
\begin{align*}
(2-36) \\
a. \text{ire} & - \text{zumi} \quad \text{'(to put in)' 'ink')} \\
b. \text{kai} & - \text{mono} \quad \text{'(to buy)' 'thing(s)'} \\
c. \text{ue} & - \text{ki} \quad \text{'(to plant)' 'tree')}
\end{align*}
\]

The second stem of each compound above may surface as direct-object of the preceding verb:

\[
\begin{align*}
(2-37) \\
a. \text{sumi} - \text{o} \quad \text{ire-ru} \quad \text{'X puts ink in'} \\
\quad \text{ACC.} \quad \text{Non-Past} \\
b. \text{mono} - \text{o} \quad \text{kaw-(r)u.} \quad \text{'X buys things'} \\
c. \text{ki} - \text{o} \quad \text{ue -ru.} \quad \text{'X plants trees'}
\end{align*}
\]
These examples involve transitive verbs where obligatory internal arguments must be satisfied within the compound. The Argument-linking Principle correctly accounts for these examples.

There are some cases in which the first stem is intransitive—that is, these verbs do not require that the second stem satisfy the first part of the Argument-linking Principle.

(2-38)

a. de — bune 'departing boat'
   'to depart'   'boat'

b. naki — goto 'complaint'
   'to cry'      'matter/fact'

The second stem in these compounds shows up with a 'so-called' semantic postposition "de" in syntax:

(2-39)

a. hune — de de-ru   'X leaves by boat'

b. (sono) koto — de naka-(r)u.   'X cries because of
   'that'     'that matter/fact'

In (2-39) 'koto' is interpreted as the cause or an instrumental. The meaning of the compound, 'naki-goto', seems to obey Allen's (1978) "Variable R Condition" which states:
(2-40) **Variable R Condition**

In the primary compound

\[
\begin{bmatrix}
\alpha_1 \\
\vdots \\
\alpha_n
\end{bmatrix}_A 
\begin{bmatrix}
\beta_1 \\
\vdots \\
\beta_m
\end{bmatrix}_B
\]

where

\[
\begin{bmatrix}
\alpha_1 \\
\vdots \\
\alpha_n
\end{bmatrix}
\]

is the semantic content of A in terms of hierarchical semantic features

and

\[
\begin{bmatrix}
\beta_1 \\
\vdots \\
\beta_m
\end{bmatrix}
\]

is the semantic content of B in terms of hierarchical semantic features

and

\[
\begin{bmatrix}
\alpha_{n-x} \\
\alpha_{n-x}
\end{bmatrix}
\]

such that \(\alpha_{n-x} = \beta_{m-y}\)

the meaning of X ranges from \(\alpha_1 (\alpha_1 \ldots \alpha_n)\)

to \(\beta_m (\beta_1 \ldots \beta_n)\)

(Allen 1978:93)

Walsh (1981) succinctly explains the **Variable R Condition** as follows:

What the **Variable R Condition** states... is that the range of possible and impossible meanings for a compound is a function of the interaction of the hierarchies of the semantic features of the compound elements." (Walsh 1981:16)

Thus, the **Variable R Condition** predicts the possible and impossible meanings of the N-N compounds such as *water-mill* as follows:
Thus, one of the possible meanings the Variable R Condition predicts for compounds such as 'naki-goto' would be something like 'the matter/fact which X cries about'.

However, 'de-bune' in (2-38a) cannot be interpreted as 'the boat X leaves by/on'. The meaning of 'de-bune' is more like 'the boat that leaves'. The second stem, 'hune (=boat)', then, refers to the subject of the verb, 'de (=to depart)', as in (2-42):

(2-42)

Hune - ga de-ru. 'The boat leaves'

NOM.

The observation made above is inconsistent with Lieber's claim that only the internal arguments participate in compound formation. There are, however, several others that seem to have the right-hand stem referring to the subject of the argument-taking item:

(2-43)

a. tobi - hi
   'to fly'  'fire'
   'flying-fire'

b. nagare - dama
   'to flow'  'bullet'
   'rampant bullets' (loose translation)

c. kare - ki
   'to dry up'  'tree'
   'dried-up tree'
   (intransitive)
The right-hand stems of the above examples can appear only as subjects with these verbs.

(2-44)

a. Hi - ga/*o/*de/*ni  tob(r)u. 'The fire flies'
   NOM./*ACC/*MANNER/*DAT.

b. Tama - ga/*o/*de/*ni nagare-ru 'The bullets flow'

c. Ki - ga/*o/*de/*ni kare-ru. 'The tree dries up'

Perlmutter and Postal (1978) hypothesize that there are two types of intransitive predicates (verb): (i) "unergative": predicates have a subject at the initial stratum; (ii) "unaccusative": predicates have no subject at the initial stratum. The criterion for classifying these two kinds of intransitive predicates depends on, according to Perlmutter and Postal, the meaning of the predicate. For instance, one characteristic of unergative predicates is that the initial subject is always Agent, Cognizer or Experiencer. On the other hand, the unaccusative predicates lack an initial subject completely. These predicates represent "states not involving cognition, actions without agents, etc. (1978:40)". Note that the Japanese verbs in examples (2-38a) and (2-43) fall into the class of "unaccusative" predicates described by Perlmutter and Postal.

Within the framework of Government Binding (Chomsky 1981-82), Burzio (1982) makes the following generalization about case-assignment properties and θ properties of verbs.

(2-45)

Burzio's Generalization:

For a verb V₁, if V₁ assigns Case to an NP it directly θ-marks, then VP₁ indirectly θ-marks its subject.

What Perlmutter and Postal (1978) call 'unaccusative' verbs are called 'ergative' verbs in Burzio's framework. We will return to Burzio's generalization in later sections with respect to Japanese 'unaccusative' (or
ergative) verbs'. It will be shown in Chapter 3, Burzio's Generalization holds for these verbs in Japanese. For the time being, I will assume that these are unaccusative verbs having only the internal arguments and no external arguments.

In Chapter 3, when the modified version of Lieber's Argument-linking Principle is developed, I will give further support to the claim that some intransitive verbs in Japanese are indeed "unaccusative".

2.3.3.2. [Noun-Verb] Noun Compounds

This class is rather more productive than the one above. Examples in (2-46) show some compounds of this type:

(2-46)

a. **u t a** – **u t a i**
'song' – 'singer'

b. **h a n a** – **m i**
'flower' – 'flower-appreciation'

c. **m a d o** – **h u k i**
'window' – 'window-washer'

d. **h i z a** – **g e r i**
'knee' – 'knee-kick'

e. **y a m a** – **n o b o r i**
'mountain' – 'mountain-climbing'

By the Right-hand hypothesis (Williams, 1981), each of the compounds in (2-46) should have the following structure:

(2-47)

```
V
 / \
N V
 / \ / \ 
[ ] [ ]
N V
```

According to Lieber, in this structure the verb normally links its obliga-
tory arguments "outside" the compound. Since all features of the verb are passed on to the highest node, the entire compound can appear as a verb in syntax, then the first stem can and must be interpreted as a semantic argument. But none of these compounds can appear as verbs independently. They must have a dummy verb, /s-/ 6, attached to them in order to appear in syntax as verbs. For example, 'mado-huki-suru (= to window-clean)' and 'yama-nobori-suru (= to mountain-climb)'.

The reason for this is that the compound formation takes place at Level II (Shaw and Nakata, in preparation). The epenthetic vowel, /i/, at the end of the verbs occur only at Level II. At this point, the non-past suffix /-ru/, which is located at Level I is inaccessible. Thus, the compound needs a verbal element to function as a verb, hence the /s-/ attachment. The majority of the elements that the dummy verb, s-, attaches to are Noun. Furthermore, the compounds in (2-46) all function as nouns in syntax. Thus, we must amend the structure proposed in (2-47). There are two possible structures that the theory permits:

(2-48)

```
a.       N
        /\       /\      
       /  \     /  \     
     N     V   N     V
       [ ]   [ ]   [ ]   [ ]
      N     V
```

Notice that both structures (2-48a-b) are subject to the Argument-linking Principle since all the features of a verb cannot percolate up to the highest node in order to satisfy its argument structure outside the compound.
There is another set of compounds that will shed some light on which is more likely to be the structure for (2-43):

(2-49)

a. nori - ori 'getting on and off' 'to ride' 'to descend'
b. waka - zini 'premature death' 'young' 'to die'
c. tabe - nokosi 'scraps (of food)' 'to eat' 'to leave'

(2-49a-c) do not contain any nominals and neither the first stem nor the second stem can appear as a noun in syntax independently. The only way the theory permits them to convert to nouns is by zero-affixation. The structure for the compounds in (2-49) is as follows:

(2-50)

Returning to the compounds (2-46) then, they have the structure represented in (2-48b). However, the problem does not stop here. Notice in (2-50), the embedded verbs are both subject to the Argument-linking Principle. For compounds like (2-49a), when both verbs are intransitive, Lieber suggests that the second part of the principle "holds only if the free stem is of a category which can act as an argument (p.265)." However, this accounts for a structure such as the one in (2-50b):
Within this structure even if the first stem and the second stem are transitive, it is possible to claim that "since they share the same argument structure, they can somehow satisfy that argument structure with the same noun... (1983:265)". Since the whole compound is still a verb, in syntax it is required that there be an NP that satisfies the argument structure. The situation is not identical with Japanese in (2-50a). The uppermost node is not "V", therefore, the features of a verb cannot percolate up to this position. Then, the head verb in (2-50a) cannot satisfy its argument structure 'outside' the compound.

In the alternative model developed in Chapter 3 these V-V compounds will be proposed to have the tree structure that is analogous to the syntactic co-ordinate structure proposed by Lasnik and Kupin (1977), Williams (1978) and Lightfoot (1983).

2.4 The Representation of Predicate Argument Structure

There have been several proposals as to how predicate argument structure (PAS) must be represented. I will present only three here within a Government-Binding (GB) or GB-like framework. Each of the three proposals will be tested against Lieber’s Argument-linking Principle to see if the proposed PASs are compatible with the Argument-linking Principle.

2.4.1 Farmer's (1984) proposal

According to Farmer (1984), "8-roles...are argument slots in PAS.
nothing more." For example, she represents transitive verbs such as 'love' and 'want' as follows:

(2-52)

a. love: (____(LOVE ____))
b. want: (____(WANT ____))

Following Williams (1981), Farmer assumes that "...subject is an external argument and object an internal argument" (1984:205/38), though, she does not assume that "...lexical structures universally have internal versus external arguments..." (1984:205/37).

For Japanese, Farmer gives the following examples:

(2-52)

c. (___ aruk) intransitive 'to walk'
d. (___ ___ tabe) transitive 'to eat'
e. (___ ___ ___ age) ditransitive 'to give'

(Farmer's p.47 (2.65))

According to these examples, Japanese does not seem to have the external-internal distinction. However, on pp.48-49, she gives the following syntactic representations with PASs:

(2-52')

c'. V'  d'. V'

\[ \begin{array}{c}
\text{NP-ga} \\
\text{aruk} \\
\end{array} \quad \begin{array}{c}
\text{NP-ga} \\
\text{NP-oj} \\
\text{tabe} \\
\end{array} \]

\[ \begin{array}{c}
\text{NP-ga} \\
\text{NP-ni} \text{g} \\
\text{NP-o} \text{k} \\
\text{age} \\
\end{array} \]

(Farmer's p.47 (2.65))
The argument-slots with 'O' and/or 'NI' in (2-52d'-e') enclosed in the internal parentheses with their respective head verbs. I will assume that this is after 'S' Assignment had applied. However, I will take the PASs in (2-52c-e) to be the correct representations of predicate argument structure for Japanese.

Farmer states, regarding these PASs such as in (2-52), "Each of these predicates has an argument slot that will be called the subject slot (p.47)". For English, in most cases, the external argument corresponds to the subject. However, for Japanese, since the non-configurational analysis is adopted by Farmer, she must, therefore, need an additional device to assign the subject slot in PASs of Japanese, which she calls "'S' Assignment".

(2-53) 'S' Assignment

Assign 'S' to the left-most argument. If this argument cannot be a subject for some reason, then assign 'S' to any other argument. (All PAS's - that is both innermost and outermost PAS's - are subject to the principle) (p.66-7)

From (2-53) the argument slots are strictly ordered as is the case with Jackendoffs (1977). This is a necessary consequence in Farmer's system for Japanese since Japanese is conceived as non-configurational and the Case-linking rules apply directly to the PASs.

~ 32 ~
The overview of Farmer’s model for Japanese is given below:

(2-54)

<table>
<thead>
<tr>
<th>LEXICAL COMPONENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRINCIPLES:</td>
</tr>
<tr>
<td>a. 'S' Assignment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERMANENT LEXICON</th>
</tr>
</thead>
<tbody>
<tr>
<td>contains:</td>
</tr>
<tr>
<td>a. List of nondecomposable items</td>
</tr>
<tr>
<td>b. Lexical entries (e.g. PASs)</td>
</tr>
<tr>
<td>c. Device of semantic linking (e.g. kara, ni)</td>
</tr>
</tbody>
</table>

| Principles of WORD FORMATION and operations on PASs |

<table>
<thead>
<tr>
<th>REGULAR CASE LINKING RULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>e.g., (GA, NI, O)</td>
</tr>
<tr>
<td>e.g., (GA, (NI, O tabe) sase)</td>
</tr>
<tr>
<td>S S</td>
</tr>
</tbody>
</table>

Note that the 'S' assignment principle is prevalent all through the lexicon of Japanese. Thus, the 'S' assignment principle plays an important role in three subcomponents of the lexicon. Word formation rules are sensitive to the existence of 'S' in the PASs. For example, the passive morpheme in Japanese is able to erase the previously assigned 'S' and assign a new 'S' to the next rightmost argument slot. An example of passivization in Japanese is given below:
How does Lieber's Argument-linking Principle fit into Farmer's system? Since all argument slots of PASs in Japanese are internal, the Argument-linking Principle predicts that any of these argument slots can participate in compounds. However, as the previous sections have shown, this prediction is not correct. A closer look reveals that the argument with 'S' assigned to it does not seem to appear in compounds. Thus, the modification of Lieber's Argument-linking Principle may have the following clause:

(2-56)

(c) if there is no internal-external distinction in the predicate argument structure, then all obligatory non-'S'-assigned arguments must be satisfied in compounds.

(2-56c) will predict that the examples in (2-38a) and (2-43) are ungrammatical since within Farmer's theory there is only one kind of intransitive verb viz. what Postal and Perlmutter (1978) call "unergative". Also, (2-56c) will rule out all compounds with derived causative verbs such as the ones given in (2-57):

(2-57)

a. hito - s a w a g + (s) a s e = people agitate-make
   'person' 'to agitate+CAUSE'

b. o y a - n a k + (s) a s e = parent-cry-make
   'parent' 'to cry+CAUSE'

c. y u - w a k + (s) a s i = hot water-boil-make
   'hot water' 'to boil+CAUSE'

Each of the verb stems in (2-57) is intransitive. Within Farmer's theory,
these have the following predicate argument structure:

\[(2-58) \quad (\ldots (\ldots \text{VERB}) \text{CAUSE}) \quad \text{S} \quad \text{S}\]

Unlike the passive morpheme, the causative suffix does not erase the previously assigned 'S'. The interpretation of the nominals in (2-57) is uniformly that of the "causee" and not of the "causer". Then, the constraint in (2-56c) cannot account for these facts.

In fact, any constraint that refers to the 'S' will be untenable since it will lead to the following paradox: since there is no distinction between the "unergative" verbs and the "unaccusative" verbs in Farmer's theory, she must account for the difference shown in (2-59) independent of predicate argument structure:

\[(2-59)\]

a. **UNERGATIVE verb**

\[\text{na ki - o ya} \quad \text{name - oy a} \quad \text{cry} \quad \text{parent}\]

\[\text{ka ci - sensu} \quad \text{ka ci - sensu} \quad \text{win} \quad \text{player}\]

\[\text{ki - hit o} \quad \text{ki - hit o} \quad \text{go} \quad \text{person}\]

b. **UNACCUSATIVE verb**

\[\text{ok a ki - su} \quad \text{ok a ki - su} \quad \text{open} \quad \text{nest} = \text{burgler}\]

\[\text{uk i - yo} \quad \text{uk i - yo} \quad \text{float} \quad \text{world} = \text{floating world}\]

\[\text{wa ki - mizu} \quad \text{wa ki - mizu} \quad \text{gush} \quad \text{water} = \text{spring-water}\]

If one tries to rule out the examples in (2-59a) by saying that any argument with 'S' cannot participate in compounding, then the examples in (2-59b) must be ruled out, also.

In the alternative approach proposed in Part III of the present thesis, Farmer's predicate argument structure is rejected.

2.4.2. **Harantz (1984) Proposal**

The model Harantz (1984) proposes differs from Farmer's (1984) in
several respects. In Farmer's model, especially in Japanese, a constituent receives its semantic role by virtue of occupying a particular slot in the predicate argument structure via indexation. Marantz, however, argues that constituents in sentences assign semantic roles to other constituents. Thus, when the constituents appear in the predicate argument slots, they 'already bear the indicated semantic roles'. Semantic-role assigners are (i) lexical items (verbs, prepositions, nouns, adjectives); (ii) predicates; (iii) case markings; and (iv) certain structural positions. In the unmarked case, an argument-taker (presently we restrict our attention to verbs and prepositions) assigns its direct argument one and only one semantic role. An indirect argument of a verb, for example, though listed in the predicate argument structure (PAS), is assigned a semantic role by a preposition.

Marantz introduces two lexical features, [logical subject] and [+transitive]. The feature [logical subject], which is relevant only at logico-semantic structure, indicates whether or not the verb which names a function from arguments to a predicate can assign an additional semantic role to the constituent which the predicate is predicated of. On the other hand, if the lexical item is specified as [+transitive], then it assigns a syntactic role. Marantz claims that only verbs and prepositions may be [+transitive] and adjectives and nouns may not.

Marantz' model of grammar is schematized in (2-60):

(2-60)

\[\text{Move Alpha} \quad \text{surface structure} \quad \text{phonological structure}\]
Given this crude overview of Marantz' model, let me illustrate it with a couple of examples:

(2-61)

a. Elmer gave a porcupine to Hortense.

b. A porcupine was given to Hortense by Elmer.

The verb 'give' has a lexical representation (2-62a) and (2-62b) is the lexical representation of 'give' after the affixation of a passive morpheme /-en/:

(2-62)

a. give : (i) (theme, goal) [+logical subject]
    (ii) [+transitive]
    (iii) /gIv/

b. give+en : (i) (theme, goal) [-logical subject]
    (ii) [-transitive]
    (iii) /gIv+En/

Thus, the constituent structures for (2-61) that derive from the information given in (2-63) will have the following representations at 1-s structure:
The semantic-role assigners, 'was') give(n)' and 'to', assign semantic roles to 'porcupine' and 'Hortense', respectively. The assignment of semantic roles obeys one condition:

If X bears a semantic relation with respect to Y, then X and Y must be sisters at 1-s structure. X and Y are sisters if they are immediately dominated* by the same constituent node.

Marantz gives the definition of immediate domination*:
Immediate Domination*

X is immediately dominated* by Y iff

a. it is immediately dominated* by Y or

b. it is immediately dominated* by a lexical category node that is immediately dominated* by Y or

c. it is immediately dominated* by a node Y' that is immediately dominated* by Y, where Y' and Y are of identical category type

Although in (2-63), the NP, 'porcupine', bears a semantic relation to the verb, 'give(n)', note that the lexical category 'V' is intervening. The immediate domination* (2-65b) permits the NP 'porcupine' and the verb 'give(n)' to be sisters.

Before going into how verbal compounds are analyzed within Marantz' theory of grammar, it is necessary to show how causative constructions are analyzed by Marantz.

First, Marantz argues that any morpheme that has semantic-role assigning features or argument structures must have an independent 1-s constituent structure. He postulates a general principle as in (2-66):

(2-66)

Principle

If a lexical item assigns a semantic role or has an argument structure, it is an independent constituent at 1-s structure

What this principle predicts for sentences with verb plus causative morpheme in Japanese is that at 1-s structure, causative sentences are analyzed as biclausal as shown in (2-67):
For Japanese, the verb and the causative morpheme, according to Marantz, 'merge' at s structure. With respect to the notion of 'merger', there are at least two possible interpretations to the above claim 9:

(2-68)

a. At l-s structure, some non-derived forms may be inserted, i.e., stems/roots and affixes will have independent, separate constituent structures, or

b. at l-s structure, derived forms may be decomposed

Marantz seems to take the first option. (2-68). He states,

(2-69)

a. two (lexical) constituents at any level of syntactic analysis may correspond to a single derived constituent at the next level

b. all affixation is lexical

c. the results of affixation, derived words, are inserted at some level of syntactic analysis

(Marantz, 1984:222-223)

Since each level of syntactic analysis is generated independently, and there is no principle prohibiting non-derived words from being inserted into syntactic representations and the Merger Principle governs the mapping
of relations and constituents, the decompositional analysis (2-68a) is not necessary. Note that the non-decompositional analysis does not violate the Strong Lexicalist Hypothesis which restricts word formation to take place in the lexicon. If the merger relates, say, two constituents at one level of syntactic analysis to one constituent at another level, then there is no word formation taking place in syntax at all.

Returning to the main theme of this thesis, 'Compounds', Marantz' theory accounts for most of the compounds involving argument-takers without Lieber's (1983) Argument Linking Principle. For example, if A in (2-70) is an argument-taker, and if B bears a semantic relation to A, or vice versa, then A and B must be sisters by the principle given in (2-64). The only statement that must be left from Lieber's Argument Linking Principle is (b) which says that a free stem must be interpretable as Manner phrase, Instrumental, Benefactive and so on.

(2-70)

\[
\begin{array}{c}
X \\
A \quad B
\end{array}
\]

However, the situation is not as clear-cut as described above. Recall that Principle (2-66) which states that any lexical item that has an argument structure or assigns a semantic role is an independent 1-s structure constituent. If this is so, then compounds such as the ones in (2-57), one of which is repeated here as (2-71a), must have the following representation at 1-s structure:


- 41 -
One of the problems posed by the compounds of the type in (2-67) is exemplified by the representation in (2-71). What is the verb, /nak-/, dominated by? There seem to be two possibilities:

(2-72)

<table>
<thead>
<tr>
<th>a.</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>?</td>
</tr>
<tr>
<td>oya</td>
<td>nak</td>
</tr>
</tbody>
</table>

b. | X |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>oya</td>
<td>nak</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b.</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>S</td>
</tr>
<tr>
<td>Oya</td>
<td>NP</td>
</tr>
<tr>
<td></td>
<td>Z</td>
</tr>
</tbody>
</table>
Note that the VP analysis, i.e., /nak-/ dominated by VP, is ruled out on two grounds:

(2-73)

(i) the morphological subcategorization requires that the suffix takes a verb

(ii) Marantz assumes that "the causative verbs and affixes take propositional arguments (1984:264)"

By the same token, the structure in (2-72a) is ruled out by (2-73ii), since at 1-s structure the causative morpheme is required to have a proposition.

However, it seems that (2-73i) is not a sufficient and necessary condition to rule out (2-72b). The support for this view comes from Marantz' analyses of applied verb constructions and causative constructions in Chi-Mwí:ni, Bahasa Indonesian, Kinyarwanda. In these languages, the applied and causative morphemes never appear as independent constituents at surface structure - they are bound morphemes. But at 1-s structure, as shown below, these bound morphemes are on a par with free morphemes (loosely speaking, "words"): 

S

NP₁  VP₁

VP₂  PP

V  NP₂  P  NP₃

Hamadi -pik- cha:kuja -il- wa:na

'cook' 'food' APPL 'children'

Hamadi  O-wa-pik-il-ile  wa:na  cha:kuja

SP-OP--cook-APPL-T/A  children  food

'Hamadi cooked food for the children'

b. Malayalam causative construction at 1-2 structure (=Marantz’ 7.94:p.277)

S₁

NP₁  VP₁

S₂  V₁

NP₂  VP₂

V₂

acchan  kuttiy  kara -ik’k'

father-NOM  child-ACC  cry  CAUSE

'Father made the child cry'
Thus, only the predicate argument structure and [logical subject] are relevant at 1-s structure. Therefore, in Japanese, the compounds involving the causative morpheme, /-sase-/, must have the representation in (2-72b) within Marantz’ theory.

Let us look at the lexical representation of the verb, the causative affix and the derived causative verb of (2-57b) – ‘oya-nakase’:

(2-75)

a. nak- ‘cry’:
   (i) Morph. [-N, +V]
   (ii) 1-s (Ø) [+log. subj.]
   (iii) s str. [-transitive]
   (iv) Phono. /nak-/

b. sase ‘CAUSE’ :
   (i) Morph. [-N, +V] [V ___]
   (ii) 1-s (caused), [+log. subj.]
   (iii) s str. [+transitive]
   (iv) Phono. /-sase-/

c. nak+sase ‘cry+make’ :
   (i) Morph. [-N, +V]
   (ii) 1-s (’cause’ (2 nak (Ø))) [+log. subj.]
   (iii) s str. [+transitive]
   (iv) Phono. /nak+sase/

Both the verb, /nak-/, and the causative affix, /-sase-/, are [+logical subject], that is, the predicates they produce at 1-s structure assign additional semantic roles to their respective subjects. However, the subject of the causative morpheme is not necessarily present in the structure like in (2-72b) at surface structure due to the Surface Appearance Principle which is stated in (2-76):

(2-76)

The Surface Appearance Principle

A constituent X will appear in the surface structure tree by virtue of bearing a relation with respect to some item Y iff Y is a lexical item (i.e., not a phrase)

(Marantz 1984:85)
On the other hand, the subject of the root verb, Z, must appear at surface structure since it is, by stipulation, exceptionally head-Governed by the causative suffix - that is, Z bears a syntactic relation with respect to a lexical item, namely, /sase-/ . If so, then Z must NOT be phonologically absent.

One way to get around the above problem is to say that Z is somehow linked with the noun outside the proposition, S in this case. Note that Lieber's Argument Linking Principle predicts that the linking between 'Z' and 'oya' is ungrammatical since 'Z' is the external argument of the verb /nak-/ . Within Marantz' theory, one must allow external arguments of verb stems with affixes to participate in compounding.

The linking mechanism proposed above is necessary for Marantz' theory not only for Japanese but also for English. Consider the following examples from Lieber (1983):

(2-77)
   a. draw-bridge, pick-pocket, push-cart
   b. after-birth, under-arm, under-belly

Both sets of examples in (2-77) have the l-s representations given in (2-78):

(2-78)
   a. 
      \[ \begin{array}{c}
      \text{N} \\
      \text{S} \\
      \text{NP} \\
      \text{V} \\
      \text{O draw} \\
      \end{array} \]
   b. 
      \[ \begin{array}{c}
      \text{N} \\
      \text{PP} \\
      \text{P} \\
      \text{after} \\
      \end{array} \]
Since the verb stem and the preposition have an obligatory argument and the constituents A and B, both of which have semantic relations to the verb and the preposition, respectively, an argument must appear in the surface structure by the Surface Appearance Principle.

The alternative approach presented in Part 3 of the present thesis will adopt several of Marantz' insightful observations except Principle (2-65).

2.4.3. Williams' (1981; 1983; 1985) proposal

Williams (in class lecture, 1985) proposes that the thematic role assignment is dependent on the notion of 'sisterhood' - that is if X assigns a \( \theta \)-role to Y, then X and Y must be immediate sisters. Following Jackendoff's (1977) proposal of "...assigning all and only the strictly subcategorized phrases to the X complement in deep structure... (p.58)", Williams assumes that all internal arguments of a verb are inserted under the X single-bar. However, one argument which Williams calls 'external argument', must be outside of the maximal projection of the head. The \( \theta \)-role assignment of the external argument is done by predication. That is, the index on the external argument percolates up to the maximal projection of the verb and turns the verb phrase into a one-place predicate.

The predicate argument structure (PAS) Williams proposes is of the form shown in (2-80):

\[
(2-80) \\
\text{Verb: } (\theta_1, \theta_2, \ldots, \theta_n)
\]

Williams advocates the position in which the thematic roles listed in the PAS are not labeled and have no psychological nor semantic content within the grammar. What is relevant for the rules of grammar is that each thematic role listed in the PAS is different from the other. These thema-
tic roles are 'realized' in syntax by the fixed list of environments which is derived from the verb-independent set of rules called 'realization rules':

\[(2-81)\]

\[(=\text{Williams (1981:(17)))}\]

\[A: (X_y, Z_w)\]

where \(X\) and \(Z\) are major categories and \(y\) and \(w\) are either prepositions or case features, and \(A\) is one of the argument types (p.88).

For example, if a verb takes a Goal argument, in English, a realization rule for Goal should look something like (2-67):

\[(2-82)\]

\[\text{Goal: (NP, PP}_{\text{to}})\]

Since the realization rule (2-82) has no reference to VP, it implies that "Goal is realized as \(PP_{to}\) in all English categories (1984:88)". Note that the realization of the external argument is not subject to the realization rules since the realization of an external argument (if there is one) is dependent on the rules of predication.

What all this amounts to within Williams' system is that the verb alone determines the assignment of \(\theta\)-roles. Note that Williams' conception of \(\theta\)-role assignment differs from Marantz' in that all arguments of a verb are treated on a par with each other in Williams' (except for the external argument) whereas Marantz takes an asymmetric view of arguments - i.e., not all arguments have an equal status in PAS. Also, within Marantz' theory, some arguments are assigned \(\theta\)-roles by other means (for example, by prepositions). On the other hand, Williams' conception of predicate argument structure and the ideas behind the "realization rules" are quite similar to those of Joan Bresnan's in Marantz' book (1984:p.19):
"...direct and indirect arguments (of Marantz' MN) are all associated with essentially equivalent slots in a predicate argument structure. Some slots may be linked by semantically unrestricted grammatical functions like subject object, while others are linked to semantically restricted functions like oblique object, marked by various prepositions. For an argument position to be linked to a semantically restricted grammatical function, the argument occupying that position must bear a semantic role appropriate to the restriction. For example, in order for an argument of a verb to be associated with the oblique from-object function, it must bear the source-role" 

(Marantz (1984:p.19))

It will be shown later that Williams' realization rules make correct predictions for Japanese, where Marantz' theory of θ-role assignment fails.

Now, since Williams, like Pesetsky (1983), Selkirk (1983), Lieber (1983) and Marantz (1984), relies on the notion (immediate) sisterhood for θ-role assignment, compounds of the form, (V N)N and (N V)N are accounted for straightforwardly. Also, unlike the problems seen in Marantz' theory, Williams' theory correctly accounts for compounds involving the causative suffix - i.e., the nominal in [N V-saselx] is interpreted as the 'causee' since it is an internal argument of the complex-verb.

With respect to the [(VV) N] compounds, however, the same problem that N has been raised in previous sections also arises within Williams' theory. Williams has pointed out in class lecture that there are two parts to Chomsky's (1982) θ-Criterion 10:

(2-84)
Williams' θ-Criterion

1) Every argument is assigned
   (i) exactly one θ-role
   (ii) no more than one θ-role

2) Every θ-role is assigned (to exactly one argument)
   (i) to an argument
   (ii) to no more than one argument
One of the problematic examples for any version of Θ-Criterion is repeated as (2-85):

(2-85)

kuruma no nori-ori no toki
'car/vehicle' GEN. 'get on-off' GEN. 'time'

"the time of the getting on and off of a vehicle"

The verb, /nor-/ (=to get on/ride), takes one obligatory internal argument, namely, Goal, as in 'kuruma ni nor-u' (=get on to the vehicle). On the other hand, the verb, /ori-/ (=to get off/descend), has Source as its obligatory internal argument as in 'kuruma kara ori-ru' (=get off from the vehicle). Then, 'kuruma (=vehicle)' is assigned two Θ-roles in (2-85) - i.e., 'kuruma' is both Source and Goal. This leads to the violation of the Θ-Criterion.

In the alternative analysis, Williams' Θ-Criterion is maintained.

One last remark on Williams' theory of morphology: Williams (1981) claims that "...morphological rules can alter argument structure in only two ways... a rule can either (a) externalize an internal argument or (b) internalize the external argument... (p.91)" An example of 'externalization' and 'internalization' is given in (2-86):

(2-86)

a. Externalization

(i) E(Th) : read (A, Th) ---> readable (A, Th)
(ii) E (O) : see (A, Th) ---> seen (A, Th)

b. Internalization

(i) I(Th) : V (A) ---> Vsase (A, Th=A)
(ii) I(G) : V(A) ---> Vsase (A, G=A

(Williams (1981: pp.93-4 & p.100))

Williams' claim here excludes all morphological rules that affect other than external arguments. However, consider the following examples from Carlson and Roeper (1980):
(2-87)

a. John situated Bill in the front room.
b. *John situated Bill
c. John resituated Bill
d. John resituated Bill in the front room
   (C&R’s (9) p.125)
e. Bob mis-calculated the time of our arrival.
   *that we would arrive at 9 O’clock.
   (C&R’s (14) p. 129)
f. Bob ran.
   *Bob ran Bill
   (C&R’s (16) p.131)

The examples (2-87a-d) show that the affixation of /re-/ makes an obligatory internal argument. Locative, of ‘situate’ into an optional one. C&R claim that in this case the prepositional phrase, ‘in the front room’ is not an argument but an adjunct. The examples in (2-87e-f) indicate that the created verb, ‘mis-calculate’, cannot take a propositional theme as its argument. The examples in (2-87g-i) show that the affixation of /out-/ adds an internal argument.

Thus, contrary to Williams’ claim that a morphological rule affects only the external argument, there seem to be a number of morphological rules that do affect internal arguments.

If these two rules, ‘externalization’ and internalization’, were abandoned, we would lose the explanation for those compounds with V+ase - that is, the external argument of a root verb can participate in compounds because the causative affix has internalized the external argument of the root verb.

Notice that these morphemes are prefixes and although they affect the verb’s internal arguments they do not change the external arguments in any way. We may hypothesize that if a language has argument structure affecting suffixes then it may not have argument structure affecting prefixes, or vice versa. Of course, this is subject to empirical testing.
1. I am grateful to Prof. M. Rochemont for these examples.

2. Pesetsky (1983: fn15) suggests that "...less strict sisterhood requirements hold..." at "S-structure" to satisfy the Projection Principle. Another suggestion made by Pesetsky is that "S-structure" for words might be misnamed;...syntactic θ-roles are not necessarily assigned...

3. The tree structure of 'restaurant-eating' in which the verb does not have an obligatory internal argument is exactly the same as 'pasta-eating' in which 'pasta' is interpreted as Theme of 'eating'.

4. The external argument is underlined in PA5.

5. Lieber's claim can be succinctly stated as follows:

The argument-taker satisfies its obligatory internal argument(s) either within the compound or outside the compound in which case the sister to the argument-taker in the compound must be interpretable as a semantic argument.

6. /s-/ is considered as a "dummy verb" only semantically, since it does not affect the meaning of the lexical item in any way nor does it add or subtract arguments of a nominalized verb.

7. In (2-57c), the causative suffix is /-sas-/. See Miyagawa (1960).

8. Note that even if 5 is not the maximal projection of V, i.e., S=INFL, these conditions predict correct outputs.


When X and Y merge, the argument structure of the derived word X+Y is the argument structure of X applied to the argument structure of Y, or to Y itself, or the argument structure of Y applied to the argument structure of X and to X itself. Where the merger of X and Y expresses the relations(s) between X-h and Y-h (constituents headed by X and Y, respectively), the LIST relations corresponding LIST and relations borne by X and Y and constituents between X and X-h and between Y and Y-h in constituent structure are determined by examining the internal structure of the derived word X+2.

10. Williams (in class lecture, UQAM 1985) has pointed out that (283:2) may be too strong due to the observation made by Roeper in the unpublished paper. For example,

(i) John promised Bill a raise.
(ii) John promised Bill.

Assuming that the verb, 'promise', has three arguments in its PAS, (AGENT, THEME, GOAL), and these three θ-roles are assigned in (i) as AGENT = 'John', THEME = 'raise', and GOAL = 'Bill', θ-Criterion (2 i) will rule out the example (ii) above.
Roeper calls this missing argument an "Implicit argument".
CHAPTER 3

AN ALTERNATIVE APPROACH

3.1. Introduction

The model of predicate argument structure outlined in this chapter is a synthesis of several leading ideas presented in Chapter 2 and elsewhere.

In the model developed here there is only one principle of 8-role assignment governing both the morphological and syntactic components.

3.2.1. Assumptions

The particular hypotheses adopted by the present model follow. First, Williams' version of the 8 Criterion is axiomatized with the proviso given in footnote 10 (Chapter 2):

(3-1) a. Every argument is assigned
    i. exactly one 8-role
    ii. no more than one 8-role

b. Every 8-role is assigned to
    i. exactly one argument
    ii. no more than one argument

The assignment of 8-role is constrained by the Immediate Sister Condition which is a modified version of Marantz' (1984):

(3-2) a. The Immediate Sister Condition

If X bears a semantic relation with respect to Y, then X and Y must be sisters. X and Y are sisters if they are immediately dominated* by the same node.

b. Definitions of immediate domination*

X is immediately dominated* by Y iff

i. it is immediately dominated by Y or

ii. it is immediately dominated* by a lexical category node that is immediately dominated* by Y or

iii. it is immediately dominated* by a node Y' that is immediately dominated* by Y, where Y' and Y are of identical category type.
As with Williams (1985), I will accept Jackendoff's observation that all strictly subcategorized internal arguments must be inserted under the first-bar projection of the verb in syntax as the First-Bar Stipulation in (3):

(3) The First-Bar Stipulation

All strictly subcategorized internal arguments must appear within the first-bar projection of the verb or the argument-taker in syntax.

The first-bar stipulation will rule out the popular analysis of the double-object construction in English as in (4):

(4)

Furthermore, the first-bar stipulation will, also, rule out Hoji's (1983) binary branching analysis of Japanese.
One other aspect of the present model that differs from most of the current morphological theories is that verbs do not have strict subcategorization frames as stated in the Aspects model (Chomsky, 1965). In his thesis, Pesetsky (1982) shows that the strict subcategorization frames in the Aspects model and in subsequent models do not meet the "condition of epistemological priority (Chomsky 1981:10)". Syntactic categories such as NP, S', AP, PP, small clauses, etc., are not "concepts that can be plausibly assumed to provide a preliminary, prelinguistic analysis of a reasonable selection of presented data, that is to provide the primary linguistic data that are mapped by the language faculty to a grammar (Chomsky, 1981:10)". Pesetsky derives the effects of strict subcategorization from other subsystems of grammar, such as Case theory, θ-criterion and semantic selection (ref. Grimshaw, 1979, 1981). For example those subcategorization frames shown in (3-6) can be predicted by Case theory:

\[(3-6) \begin{cases} a. \quad \{NP\} \\ b. \quad S' \\ c. \quad NP \end{cases}\]

If a verb is specified as [+transitive], it can have either an NP or S' complement as in (3-6a). If the verb is [-transitive] and specified for a complement (maybe in its predicate argument structure), then the complement must be (3-6b). If the verb is [+transitive], it must necessarily have an
If we assume that verbs do not have subcategorization frames, then we should be able to maintain the distinction between affix and non-affix which is proposed in the immediately following section.

3.2.2. Theory of Percolation

There are at least two different proposals of feature percolation:

(3-7)

i. Selkirk's (1982) Percolation

a. If a head has a feature specification \([F^l = u]\), its mother node must be specified \([F^l]\), and vice versa.

b. If a non-head has a feature specification \([uF^l]\), and the head has the feature specification \([vF^l]\), then the mother node must have the feature specification \([F^l]\).

(p. 76:3.20)

ii. Lieber's (1980 & 83) Feature Percolation Convention

a. Convention I

All features of a stem morpheme including category features, percolate to the first non-branching node dominating that morpheme.

b. Convention II

All features of an affix morpheme, including category features, percolate to the first branching node dominating that morpheme.

c. Convention III

If a branching node fails to obtain features by Convention II, features from the next lowest labeled node automatically percolate up to the unlabeled branching node.

d. Convention IV

If two stems are sisters (i.e., they form a compound), features from the right-hand stem percolate up to the branching node dominating the stems.

(1983:252-3:(3))

The most significant difference between these two systems of percolation concerns the notion of head. Within Lieber's theory of morphology,
there is no mention of 'head'. Whereas for Selkirk (1982) the concept, 'head', is a necessary term since her theory of Percolation relies on it. Furthermore, she explicitly uses the concept, 'head', to claim that such examples as in (3-8) are exocentric:

\[(3-8)\]
\[
\begin{array}{llllll}
  a. & \text{cutthroat} & b. & \text{pickpocket} & c. & \text{scarecrow} \\
  d. & \text{saw bones} & e. & \text{cutpurse} & f. & \text{daredevil}
\end{array}
\]

(p.26: (2.17))

Selkirk explains that "Cutthroat does not designate a throat, but rather someone who cuts throats (p.26)". She suggests that "...the grammar of English will include a statement specific to this particular configuration, assigning the verb-argument interpretation to the parts and the appropriate exocentric interpretation to the whole (p. 26)".

Lieber, as mentioned in 2.0, on the other hand, argues for an autonomous lexical semantics to account for the non-compositional interpretation of compounds such as in (3-8) without the concept of 'head'.

The issue to be addressed here is whether it is necessary to have this concept in theory of grammar. Since Selkirk claims that the examples in (3-8) have no 'heads', it cannot be a configurationally definable term. Observe the following lexical structure of (3-8a):
If Selkirk claims, "a word structure has the same general formal properties as syntactic structure, and moreover, that it is generated by the same sort of rule system," then the definition of 'head' of a word structure should not be any different from that of a syntactic structure. For example, Jackendoff (1977) gives the following definition of 'head':

\[(3-9) \quad \text{Definition of 'Head'}\]

\[
\text{the head of a phrase of category } X^n \text{ can be defined in two different ways, either as the } X^{n-1} \text{ that it dominates, or as the lexical category at the bottom of the entire configuration.}
\]

(Jackendoff 1977:30)

If Selkirk's observation that word structure and syntactic structure share "the same general formal properties", then each of the examples in (3-8) should have a 'head' as defined in (3-9). Note that Selkirk stipulates that within W- syntax the upper bound for the category X is fixed as X^n, where n ≤ 0. Recall in Chapter 2, the following set of phrase structure rules has been given from Selkirk's monograph.

\[(2-2)\]

\[
\begin{align*}
X^n \rightarrow X^m Y^p \\
X^n \rightarrow Y^p X^m
\end{align*}
\]

Where \(0 \geq n \geq m:p\)

The head of a word from (2-2), is derivable by applying Jackendoff's definition in (3-9). If it is the case that Selkirk wants to maintain the
similarity between word structure and syntactic structure then her claim that the examples in (3-8) have no 'heads' makes Jackendoff's definition given in (3-9) 'ad absurdum'.

Why Selkirk wants to claim that the examples in (3-8) are non-headed is because of her commitment that the semantic head and the categorial head of compounds must be isomorphic, in other words, if the meaning of a compound is compositional then the compound is headed; if not, then that compound is exocentrically derived. From the above view, the 'head' in morphology and the 'head' in syntax differ, contrary to Selkirk's original claim that word structure and syntactic structure share the same general formal properties. In syntax nothing of the sort described above is permitted, i.e., regardless of the compositionality of the sentence, phrasal categories are endocentrically derived.

If lexical semantics were isomorphic with lexical structure, not only those compounds Selkirk presented in (3-8) should be exocentric but all the bracketing paradox cases such as 'ungrammaticality', where the lexical structure is not isomorphic with semantics, should also be exocentric. Since this is not the case in Selkirk's model, i.e., the bracketing paradox cases are generated by regular Word Structure rules, it is inconsistent to claim that compounds that have non-compositional meaning are exocentrically generated. Furthermore, Selkirk, as does Lieber (1980), suggests that her 'non-headed' compounds such as in (7), are "interpreted by semantic rules specific to them (p.25-26)". Thus, these compounds must be generated by the regular compound formation rule without any reference to the 'head' but to the language-particular location - i.e., whether right-hand or left-hand.

The next task is to determine whether the concept, 'head' is necessary for the theory of Percolation. However, before going into Percolation, let
us look at the lexical entry of the affix in both Selkirk’s (1982) and Lieber’s (1980) frameworks:

(3-9)
i. Lieber’s (1980)
   a. The category and conjugation or declension class of an item
   b. Phonological representation
   c. Semantic representation
   d. Subcategorization
       (p.35)

ii. Selkirk’s (1982)
   a. Its category (involving a specification of its type (level Af) and of its categorial features, syntactic and diacritic)
   b. Its subcategorization frame
   c. Its meaning
   d. Phonological representation
       (p.5)

Given that the affix is specified for its category and for its sister to which it attaches, it would be redundant for Percolation to refer to 'head'. Let me illustrate this point with examples:

(3-10)

\[
\begin{align*}
&\text{a. } X \quad \text{b. } Y \\
&\hspace{1cm} X \quad \hspace{1cm} X \\
&\hspace{2cm} x \quad \hspace{2cm} x \\
&\hspace{3.5cm} y \\
&\hspace{3cm} [\{x \ y\}]
\end{align*}
\]

The lexical structure in (3-10a) is necessary for mono-morphemes, such as 'dog', 'happy', or 'eat', etc. Thus, whether the stem, in (3-10a-b), is bare or affixed, it must have the structure represented in (3-10a). On the other hand, no affix can have the (3-10a) structure, since the affix must
always have a sister. Since the structure (3-10a) is not the appropriate representation for an affix with its own category to be inserted into, it must be inserted into a binary branching tree such as the one in (3-10b).

The percolation mechanism need not refer either to the 'head' as in Selkirk's or to the affix or the stem as in Lieber's if we view the percolation as moving some set of features to a node in the tree. The suggestion made above takes one of the two functions of Selkirk's Percolation as given in (3-7): Not only does Selkirk's Percolation percolate the features of the head up to the mother node but it also acts as a well-formedness condition ensuring that the subcategorization of an affix is observed. I assume that Lieber's Percolation Conventions also have these two properties since they ensure that the percolation of the features of affixes takes precedence over the percolation of the features of stems.

The proposal made here is that Percolation has only one function, namely, Percolate freely, and subject to a certain well-formedness condition, call it "the generalized projection principle" monitoring the representation at each level of analysis.

(3-11)

a. Percolation

Percolate freely

b. The Generalized Projection Principle

Representation at each linguistic level are projected from the permanent lexicon, in that they observe the subcategorization properties of lexical items.

The proposal here, then, is different from Lieber's and Selkirk's. For Lieber, Percolation is a set of conventions. For Selkirk, it is a set of well-formedness conditions. Here, Percolation is proposed as "Percolate freely", that is, Percolation is viewed as a rule which is already needed in syntax.
Let me give some examples of what has been proposed in this subsection so far. In the model proposed, there is only one set of category-neutral context-free rewriting rules, such as the one proposed by Lieber (1980). These rules generate unlabeled binary branching trees:

\[(3-12)\]

\[
\begin{array}{c}
\quad \quad \quad \quad \quad \\
\quad \quad \quad \quad \quad \\
\quad \quad \quad \quad \quad \\
\quad \quad \quad \quad \quad \\
\quad \quad \quad \quad \quad \\
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\quad \quad \quad \quad \quad \\
\quad \quad \quad \quad \quad \\
\quad \quad \quad \quad \quad \\
\quad \quad \quad \quad \quad \\
\end{array}
\]

As with Selkirk and Lieber, the distinction between affix and non-affix is based on whether or not a particular lexical item has a subcategorization in its lexical entry: affixes are inherently specified for sisters, whereas non-affixes are not.

The category specification is indicated by the features, \([+N, +V]\), as in Selkirk's and Lieber's models. The lexical entries of affix and non-affix will look something like in (3-13):

\[(3-13)\]

i. affix: 
   a. Category \([+N, +V]\)
   b. Subcategorization \([..._] \text{ or } [_...]\)
   c. Semantic information
   d. Phonological information

ii. non-affix:
   a. Category \([+N, +V]\)
   b. Phonological information
   c. Semantic information

According to Pesetsky (1985), the subcategorization frame of an affix serves two purposes: it indicates the positional requirement and the categorial requirement of its sister to which the affix attaches. What is relevant for morphology is only the 'positional' requirement. The 'categorial' requirement is relevant at the level of LF. I will accept Pesetsky's (1985) hypothesis with no argument.
The overview of the proposed model is given below:

(3-14)

a. The category-neutral context-free rewriting rules will generate unlabeled binary branching trees e.g.,

```
  \  /
 / \  \
/   \ 
```

b. The lexical insertion transformation inserts lexical items into the unlabeled binary branching trees, e.g.,

```
  \  /
 / \  \
/   \ 
```

happy ness operative

Percolation (Percolate freely) which is subject to the G.P.F., will properly distribute feature specifications onto tree nodes, e.g.,

```
  \  /
 / \  \
/   \ 
```

N

A

A

happy ness operative

d. For compounds, as Lieber (1980:1983) observes, there is a language-specific statement as to whether the right-hand or the left-hand stem percolates its features to the mother-node, e.g.,

(i.) English/Japanese (ii.) Vietnamese

```
  \  /
 / \  \
/   \ 
```

B

A

A

B

It might be objected that in cases such as 'happiness' and 'opera-
tive', the argument(s) of the stem is (are) not satisfied, thus, leading to
the violation of the (Generalized) Projection Principle. However, it is a
well-known and well-established fact that certain affixes have the inherent
ability to alter the argument structure of the argument-taker as in (2-85)
and (2-86). The prime example is the passive morpheme. The passive mor­
pheme makes the obligatory agentive argument an optional one in English and
in the direct (as opposed to indirect or adversative) passive of Japanese.

For example,

(3-15)

a. John killed Bill.

b. Bill was killed (by John).

c. John ga Bill o Korosi-ta.
   NOM.  ACC.  'Kill-PAST'

d. Bill ga (John ni) Koros-(r) ure-ta.
   by PASSIVE

The verb stems, 'kill' and 'koros-', have two obligatory arguments. In
addition to externalizing no argument and absorbing the case-assigning
feature of the verb, the passive morphology optionalizes the agentive argu­
ment which used to be the external argument.

The (Generalized) Projection Principle looks at the relevant level of
linguistic analysis. In morphology, it is the word, not the constituents,
that is relevant. What this means is that, for example, in passive, the
Projection Principle will look at the mother node which carries the altered
argument structure.

Returning to the original examples, 'happiness' and 'operative', they
have the following lexical structures:
Before turning to those compounds with argument-takers, I will review the proposals made by Williams (1981) and Marantz (1984) on the representation of predicate argument structure.
3.2.3. The Predicate Argument Structure

In section 2.4, three different representations of predicate argument structure (PAS) have been presented:

(3-17)

a. Farmer:  
   i. (θ₁...θₙ)
   ii. arguments are strictly ordered
   iii. no distinction between external and internal arguments (at least for Japanese)

b. Marantz
   i. (___...___)
      θ₁...θₙ
   ii. arguments are unordered
   iii. if a verb is [+logical subject], then the function from arguments to predicates which the verb names produces an additional semantic role

c. Williams:  
   i. (θ₁...θₙ)
   ii. arguments are unordered
   iii. one argument (usually, Agent), in the unmarked case, must be realized outside of the maximal projection of the head

Since there has been a number of arguments against the nonconfigurational analysis of Japanese (Arai (1983), Saito (1983), and Hoji (1983)) and there seems to be some evidence of unaccusative (= 'ergative') verbs in Japanese (see section 2.2.1.), I will reject Farmer's predicate argument structure for Japanese.

There are two significant differences between Williams' and Marantz' theories: (i) Within Marantz' theory, the semantic role of the argument in [NP, S] position is determined by the predicate. On the other hand, within Williams' theory, the semantic role of the argument in the [NP, S] position is determined by the head itself. (ii) For Marantz, not all inherent arguments of the verb are assigned semantic roles by the verb, but by other
constituents hence the distinction between 'direct' and 'indirect' arguments. In Williams' all arguments are assigned 8-role by the argument-taker.

Let us look at the first difference. Rothstein (1985) argues against Marantz' position based on the marginal status of the examples in (3-18):

(3-18)

a. John's gift of the book late
b. John's arrival in a hurry
c. John's performance drunk

(Rothstein, 1985:43)

The nominal head in each of these examples, 'gift', 'arrival' and 'performance', has an external theta-role to assign. However, "the general rules of theta-role assignment designate agent as an external argument assigned through predication". Predication, as stated earlier, is defined as a relation between YP and XP, each of which is a maximal projection of Y and X, respectively. If this is so, then 'John' cannot be assigned an agent role through predication since the phrase that contains the head of the NP in (3-18) after 'John' is an N' as shown in (3-19):

(3-19)

[[[John] [...head...] ]]
NP N' NP

Rothstein suggests that the marginal status of these examples can be accounted for by allowing the agent role which the head is specified for in its lexical entry to be 'improperly' assigned to 'John'. Once 'John' is assigned a theta-role, then the secondary predicate can be predicated of 'John'.

Rothstein claims that the above account can be maintained only if the external theta-role is explicitly specified in the lexical entry, i.e. the head determines the external theta-role. Marantz' theory fails, so Rothstein's argument goes, to account for these marginal examples because the head in each of these phrases is not specified for an agent role and there
is no maximal projection to determine the external thematic-role of 'John' within Marantz' theory. Unfortunately, Rothstein's claim that in Marantz' theory the external theta-argument is determined by the maximal projection is incorrect. In Marantz' theory, the 5 is the maximal projection of the verb. Thus, the projection that acts like a predicate of other theories such as Williams' (1980 & 81) and Rothstein's (1985), is not the maximal projection but the nonmaximal projection of the verb within Marantz' theory.

However, Rothstein is correct in concluding that in Marantz' theory 'John' in (3-18) cannot be properly assigned a θ-role. Marantz' following comment confirms Rothstein's observation: "...nouns do not form predicates or other phrasal constituents that might take subjects" (p.66). Thus, Marantz would rule out the possibility of taking the N' in (3-19) to be the predicate of 'John'.

The issue discussed above, i.e. whether the external thematic argument is determined by the head or by some projection of the head, has been pointed out by Bresnan (1982:p.291) and to which Marantz (1984) has given the following reply:

"The arguments for the particular representation of the asymmetries within the present theory come from considerations of the operation of the theory as a whole. I choose the present form of representation for these asymmetries—excluding the subject from the P-A structure—because it both correctly captures the semantic asymmetries, as Bresnan points out..., and allows me to relate semantic subject/non-subject asymmetries to parallel syntactic asymmetries." (Marantz 1984:p.28)

Marantz' main concern is to capture the asymmetries between subject and nonsubject in both semantic and syntactic descriptions.

The problem that Marantz' theory encountered with Rothstein's examples shown in (3-18) can be remedied by adopting the following rule proposed by Williams (1982):
The relation between the possessive NP and the following N' can be any relation at all. (Williams 1982:p.283)

Thus, the marginal status of (3-18) can be accounted for by claiming that only if 'John' is interpreted as having the agentive relation to the following N', the phrase-final predicate can be predicated of 'John'.

The second difference between Marantz' and Williams' theories is the assignment of $\theta$-roles. For Marantz, in the unmarked case, only the direct arguments of a verb are assigned $\theta$-roles by the verb, the indirect arguments are assigned $\theta$-roles by other than verbs, such as prepositions or case or structural position. For Williams, verbs assign $\theta$-roles. How these $\theta$-roles are manifested in syntax is determined by the language-particular "realization rules". Thus, within Marantz' model, though all of the verb's obligatory arguments are specified for $\theta$-roles, only the phrases that are not headed by prepositions may be assigned $\theta$-roles by the verb.

However, Williams' model is more restrictive than Marantz'. This can be shown in the following:

(3-20)

i. Williams
   In the unmarked case, the NP bears a $\theta_X$ if and only if it is governed by Py.

ii. Marantz
   In the unmarked case, if an NP bears a $\theta_X$, then the NP may be assigned that $\theta_X$ by Py.

where $\theta_X$ stands for any thematic role and P stands for any lexical category

For Marantz, the converse (3-21 iii) below is not necessarily true:

iii. In the unmarked case, if an NP is assigned a $\theta$ by Py, then that NP bears a $\theta_X$.

When an argument can be realized in two different environments, Marantz' theory seems to have some difficulty. Observe the following:
a. *kuruma kara ori-ta*  
'vehicle'   Source 'get off' PAST  
b. *kuruma o ori-ta*  
"X got off (from) the vehicle"  

Within Williams' system, SOURCE has two realization rules:

(3-23)  
a. SOURCE: (NP, PPkara)  
b. SOURCE: (NP)  

Within Marantz' system, the argument of /ori-/ is both direct and indirect and must be specified when it is a direct argument or an indirect argument. e.g., if the verb /ori-/ is a case-assigner, then the argument is direct, if it's not, then indirect.

Furthermore, when the verb /ori-/ is nominalized, Marantz' system completely breaks down:

(3-24)  
a. *kuruma kara no ori-kata*  
GEN. Nominalizer  
b. *kuruma no ori-kata*  
"the way of getting off (from) the vehicle"  

Williams' system does not have to state anything since the list of realization rules is specified verb-independently: the SOURCE interpretation of 'kuruma' in (3-24b) is readily available. On the other hand, Marantz' system cannot predict (3-24b) since 'kuruma' in both (3-24a & b) does not rely on the postposition nor the verb for case, and therefore, its θ-role assignment cannot be correlated with the case-assigning feature of the verb.

The overall picture sketched above is that as Japanese data show, it is necessarily the case that the θ-roles must be assigned by the verb.

The model being developed here adopts Marantz' predicate argument structure, i.e., only the internal arguments of the verb are represented in
Marantz gives the supporting arguments and evidence for this representation from various languages. With respect to compounds, ever since Roeper and Siegel (1978) and subsequently Selkirk (1982) and Lieber (1983), it has been shown that it is the internal arguments (sisters to the verb for Roeper and Siegel and non-subject arguments for Selkirk) that can participate in compound formation. Thus, the asymmetry of subjects and non-subjects seems to appear in morphology as well as in syntax and semantics.

Marantz' Principle (2-65) states that "if a lexical item assigns a semantic role or has an argument structure, it is an independent constituent at 1-s structure". It was argued that this principle cannot be included in the present model; consequently, we will need a new way of assigning a semantic role to the demoted subject in such cases as causative construction to have biclausal structures at 1-s structure. However, the present model cannot have biclausal analyses for causative constructions due to the elimination of Principle (2-65).

As it is well-known in Japanese causative constructions, the suffix /-sase-/ adds an extra argument, 'causer'. In the present model, the causative suffix is specified with [+logical subject] which produces this extra thematic role. Furthermore, we will assume, along with Williams (1981), that the causative suffix internalizes the verb's [+logical subject] argument as 'causee'. It may be objected that the feature [+logical subject] is merely a marker on the predicate that the verb names to indicate that the predicate produces another semantic role. We are not denying this view of the feature [+logical subject]. What the 'causee' argument does is that the semantic role the predicate produces must be assigned internal to that predicate if and only if the NP that is to receive this semantic role is in the appropriate position. For example:
In (3-25), 'oya' is in the appropriate position to receive the semantic role the predicate produces. It may be the case that this semantic role is a fusion of 'causee' and the role produced by the predicate.

Note that if the verb is intransitive, as in (3-25) 'nak', the causee NP can appear with the accusative case marker:
The noun 'oya' in (3-25b) is not in the appropriate position for the predicate to assign the semantic role it produces; it is assigned only the 'causee' role. In this case, the ['logical subject'] feature of the verb may or may not stay in the representation for semantic interpretation.

How do we predict/account for these two possible syntactic analyses? Let us look at the lexical structure of the derived structure of 'nak-(s)ase-ita':
As we have proposed in section 3.2.2., the percolation is "percolate freely". Thus, everything can, in principle, percolate up to the mother node, only what is forced by the theory as a whole remains. Notice the feature, \([\text{transitive}]\), in (3-26). There is no necessary reason that the causative suffix must be \([\text{transitive}]\). However, the subject of an intransitive verb such as 'nak' can appear as a direct object of the derived causative verb optionally, it is sufficient to claim that /-sase-/ has an optional feature \([\text{transitive}]\). Only when the subject of the intransitive verb appears within the first-bar projection of the derived causative verb, does the theory forces the feature \([\text{transitive}]\) to percolate up to the mother node.

The fusion of the feature, \([\text{logical subject}]\) of the verb, 'nak' for example, and the semantic role, 'causee', is necessarily so if we accept Williams' (1981) argument for incorporating "a limited use of the lambda calculus": that is, the lambda calculus restricts the number of external argument to one and only one.
3.3 Consequences of the model proposed

3.3.1. Compounds

As stated in Section 2, the Argument-linking Principle of Lieber (1983) can be dispensed with, since the Immediate Sister Condition will account for all the compounds of the form in (3-27):

(3-27)

A

\[ X \]

B

If A is an argument-taker and X=B, then B must satisfy A’s argument structure. On the other hand, B is an argument-taker and X=B, then either A or what is on the outside of the whole compound may satisfy B’s argument structure.

Note that I have not made any restriction that only the internal arguments (obligatory or optional) may participate in compound formation. Such a restriction is spurious since, by assumption, the external argument must be assigned its 8-roles by predication. Predication is a relation between two phrasal categories, XP and YP, not between two lexical categories.

Now, we come to the [V-V] compounds in which both verbs involved have obligatory internal arguments. First, we will begin with those [V-V] compounds that are verbs, such as the ones in (3-28):

(3-28)

a. freeze-dry, stir-fry, drop-kick, slam-duck

b. hiki-das (to pull-take out), tabe-nokos (to eat-leave transitive), osi-ire (to push-insert)

Note that in the above examples, both verb stems of the compounds are transitive, thus, the obligatory internal arguments must be satisfied.
Note, further, that the features of the right-hand stem percolate up to the mother node, thereby satisfy its internal argument with the phrase outside the whole compound. The problem is the internal arguments of the left-hand verb stem.

What is clear at this point is that the right-hand verb stem cannot serve as an argument to the left-hand verb stem (cf. Lieber (1983:p265)). This is ruled out on pre-theoretical grounds: Verbs are assumed to be lexical items with no referential function in semantic description. Whatever it is that can be an argument must be able to pick out some entity in the world. The fundamental idea behind the above assumption comes from Categorial Grammar developed by Edmund Husserl (1962). Since all current syntactic theories, all versions of GB theories (Chomsky (1980 & 81), Marantz (1984), Farmer (1984)), LFG and Relational grammar, seem to share the same assumption above, the burden is on those morphologists who are working on verbal compounds.


The three dimensional proposal raises a couple of interesting questions: (1) which stem percolates its features to the mother node? and (ii) how is the internal argument of each of these verbs satisfied?

First, in the three dimensional structure, both stems percolate the features since there is no way of telling which is on the right-hand side or on the left-hand side. Once the categorial features are percolated up to the mother node, they will be fused together:
Each verb constitutes a single, individual argument complex. The internal argument of each of the verb stems in the compound is satisfied separately. This is diagrammatically shown in (3-30):

(3-30)

a.
Each arrow constitutes a separate independent argument complex. Therefore, there is no violation of the $\Theta$-Criterion.

Let us return to the examples in (3-28b), repeated here as (3-31a). The three-dimensional proposal overgenerates the forms in (3-31b) which have, on the right-hand side, the intransitive counterparts of /das-/,$/nokos-/,$ and /ire-/.

(3-31)
   a. hiki-das (to pull-take out), tabe-nokos (to eat-leave), osi-ire
      transitive
      (to push-insert)
   b. *hiki-de (to pull - come out), *tabe-nokor
      (to eat-leave), *osi-hair (to push-enter)
      intran.

How do we rule out the overgenerated examples such as the ones in (3-31b)?

Note that each stem of the compounds in (3-31a) has one obligatory internal argument, whereas only one stem in each of the compounds in (3-
31b) has an argument. The constraint I propose here is the Across-the-Board Application. That is, if it is the case some rule or condition applies to one stem then it is necessarily the case that the same rule or condition must apply to the other stem.

3.3.2 Conclusion and Residual Problems

In this chapter, we have argued that the satisfaction of predicate argument structure is governed by the same principle, namely, the Immediate Sister Condition, in both syntax and morphology. Furthermore, Percolation is proposed to be constrained by the (Generalized) Projection Principle which reduces percolation to bare minimal "percolate freely". In the previous section where the Generalized Projection Principle has been proposed, I have deliberately avoided the formalized version of the Projection Principle in Chomsky (1981:36-38) which is given below:

(3-32)

(a) i. \[ \ldots \alpha \ldots \beta \ldots \]  
    ii. \[ \gamma \ldots \beta \ldots \alpha \ldots \]  

(Chomsky’s (5) p36)

(b) i. if \( \beta \) is an immediate constituent of \( \gamma \) in (a) at \( L_i \), and \( \gamma = \alpha \), then \( \alpha \) marks \( \beta \) in \( \gamma \)  
    ii. if \( \alpha \) selects \( \beta \) in \( \gamma \) as a lexical property, then \( \alpha \) selects \( \beta \) in \( \gamma \) at \( L_i \)  
    iii. if \( \alpha \) selects \( \beta \) in \( \gamma \) at \( L_i \), then \( \alpha \) selects \( \beta \) in \( \gamma \) at \( L_j \)  

(Chomsky’s (6):p38)

The effects of (3-31b.i.) can be obtained from the interaction of our Immediate Sister Condition and the First Bar Stipulation.

With respect to (3-32b.ii. & iii.) it is ambiguous whether the term ‘select’ means s(emanic)-selection or c(ategorial)-selection. If it designates s-selection, then the Projection Principle applies at the level of
semantic interpretation as well as at syntax since s-selection consists of such notions as 'Proposition', 'Exclamation', 'Question' and so on. These notions are not available in syntax but only in semantics.

As we have stated earlier, there are no subcategorization frames as those proposed in the Aspects model. Thus, the term 'select' cannot mean c-selection.

However, we can still retain Chomsky's formalized Projection Principle as it is in (3-32). Furthermore, we retain the ambiguity of the term 'select'. This is a necessary move in the model proposed here. The c-selection applies only in affixation as shown in the derivation given in (3-14) since the sister of an affix is categorially specified. On the other interpretation of 'select', i.e. the s-selection, it applies at the level of semantic interpretation. It also applies at the level of syntax where θ-roles, but not such semantic notions as 'Proposition', 'Exclamation' or 'Question', are involved. Thus, as proposed, the Projection Principle is generalized over morphology and over semantics.

Another consequence of the analyses given in this thesis is if it is the case that Japanese has unaccusative verbs as proposed in Chapter 2, then clearly the non-configurational analysis of Japanese syntax must be abandoned. It seems that there are asymmetries between subjects and non-subjects which do exist in morphology of Japanese, as argued in this thesis.

The issues raised here are still very controversial in current linguistic theory. However, I hope the proposals and analyses given in this thesis will shed some light on the future research.
FOOTNOTES

1. I am indebted to Prof. E. Williams (personal communication) for pointing this out to me.

2. This is a slightly modified version of Chomsky's (1981) original Projection Principle (p.29). The Extended Projection Principle of Chomsky (1982) is rejected since the additional clause which states that every clause must have a subject can be derived from Rothstein's (1985) Predicate-Linking Rule:

Rule for Predication (for English)

a. Every non-theta-marked XP must be linked at S-structure to an argument which it immediately C-commands and which immediately Commands it.

b. Linking is from right to left (i.e., a subject precedes its predicate)

(Rothstein, 1985:11)
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