UNIVERSITY OF CALIFORNIA
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Phonological Phrasing in Japanese

A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy in Linguistics

by

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1994
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ACKNOWLEDGEMENTS

I would like to thank the members of my committee, Shoichi Iwasaki, Robert S. Kirsner, Russell G. Schuh, Donea Steriade and Bruce P. Hayes for their help and patience with me and this dissertation. Particularly, I am grateful to Bruce for his stimulating comments and constructive suggestions, too numerous to cite individually throughout the making of this dissertation.
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PUBLICATIONS AND PRESENTATIONS


This dissertation characterizes and formalizes the principles governing well-formed phonological phrasing at all levels (except the utterance) in Japanese in the theory originally proposed in Selkirk (1978). Following Pierrehumbert and Beckman (1988), I assume, in this dissertation, four levels of prosodic organization in Japanese: the utterance, the intermediate phrase, the accentual phrase and the phonological word. For each prosodic category (except the utterance), its organizational principles are characterized and formalized with reference to the syntactic and focus structure of a sentence and with respect to the relationships with its super- and subordinate prosodic categories.

Of the four phonological phrasal levels, the intermediate phrase is the most complex in that its well-formed phrasing patterns are the results of the interaction of a
number of constraints in the following manner. 1) A sentence is intermediate-phrased at the edges of XP’s and the verb, just in case the verb is long, and there is no focus. 2) If the verb is short, its special phrasing requirements override the normal phrasing patterns. 3) If there is focus, its special phrasing requirements override the verb phrasing patterns.

To account for these data, I propose an Optimality-theoretic analysis (following Prince and Smolensky 1992 and McCarthy and Prince 1992), in which constraints are arranged in a hierarchical fashion, in layers of those which maximize and those which minimize the number of intermediate phrases per utterance. I show that constraints interact only between maximizing and minimizing ones layered in a hierarchy, and present evidence to show their overriding relationships with one another.
The objective of this dissertation is to characterize and formalize the principles governing well-formed phonological phrasing at all levels (except the utterance) in Japanese. The term phonological phrasing here refers to phonological representation of the surface syntactic structure of a sentence in terms of prosodic categories at and above the level of phonological words in the theory originally proposed in Selkirk (1978). Following Pierrehumbert and Beckman (1988), I assume, in this dissertation, four levels of prosodic organization in Japanese: the utterance, the intermediate phrase, the accentual phrase and the phonological word.

For each prosodic category (except the utterance), its organizational principles will be characterized and formalized. There are two main organizational schemes for well-formed phrasing: with reference to the syntactic and focus structure of a sentence, and with respect to the interrelationships among prosodic categories. Each prosodic category will be discussed with explicit or implicit reference to these two organizational schemes.

The following chapters are organized as follows. The first chapter covers the background material on the syntactic structure of Japanese, the relation between syntax and phonology and the tonal and intonational characteristics of Japanese at various phrase levels.

The next three chapters, Chapters II, III and IV, deal with the principles of intermediate phrase organization. Chapter II discusses the effect of focus on well-formed intermediate phrasing patterns. Chapter III, the main chapter on intermediate phrasing, presents a constraint-based analysis within Optimality Theory. Chapter IV concludes intermediate phrasing with an empirical survey and predictions. Some of
the material covered in these three chapters assumes the results from later chapters, and I will indicate and explain them briefly where relevant.

Chapter V reviews the views expressed in the traditional grammar, and propose an analysis in which every phonological word constitutes an accentual phrase when there is no focus involved. The accentual phrasing patterns when there are focused constituents (briefly discussed at the end of Chapter II) will be explicated at the end of Chapter V. Chapter VI presents an analysis on phonological word formation on the basis of the typology of various accent rules.

Chapter I Preliminaries

This chapter begins with remarks on the transcription used in this dissertation, and the relation between syntax and phonology in general. The rest of the chapter discusses the tonal and intonational characteristics of phonological phrases at various levels in Japanese.

1.1 Phonemicization and transcription

The transcription used in this dissertation is phonemic. The phonemic status of each segment is determined by the principles of contrast and alternation.

Contrast

The alveolar fricative [s] contrasts with the prepalatal fricative [ɕ] (transcribed as [sh] in the Hepburn romanization) before /u, e, o, a/. Only [ɕ] is possible before /i/, however. The following chart summarizes the phonemic consonants in Japanese
determined by the contrast principle, transcribed in IPA and in the Hepburn romanization in parentheses which I will use:

<table>
<thead>
<tr>
<th></th>
<th>Bilabial</th>
<th>Alveolar</th>
<th>Prepalatal</th>
<th>Palatal</th>
<th>Velar</th>
<th>Labial-velar</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plosives</td>
<td>p</td>
<td>t</td>
<td></td>
<td></td>
<td>k</td>
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<td></td>
<td>b</td>
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<tr>
<td>Fricatives</td>
<td>f</td>
<td>s</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affricates</td>
<td>s</td>
<td>p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nasals</td>
<td>m</td>
<td>m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approximants</td>
<td>r</td>
<td>r</td>
<td></td>
<td></td>
<td>j(y)</td>
<td>w</td>
<td>h</td>
</tr>
</tbody>
</table>

**Alternation**

Some of the segments in the chart alternate in derived environments. For example, the verb stem *hanas-* ‘speak-’ alternates with *hanash-* as follows:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Conjugation: <em>hanas-</em> ‘speak-’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hanash - i</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hanas - u</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hanas - e ba</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hanas - o o</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hanas - a nai</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I will transcribe a surface [sh] as /sh/ if it does not alternate with an [s]. For example, since the [sh] in *[shigoto]* ‘work’ does not alternate with an [s], I will transcribed it as /shigoto/ in the phonemic transcription.
If a surface [sh] alternates with an [s], I will transcribe it as /s/. For example, since the [sh] alternates with an [s] in the continuative form of the verb stem hanas- 'speak,' I will transcribe it as /hanas-i/ in the phonemic transcription.

The other alveolar and prepalatal plosives, fricatives and affricates, if they alternate, will be phonemicized as follows:

1. Phonemic
   sa  si  su  se  so  za  zi  zu  ze  zo
   Phonetic/IPA sa  ci  su  se  so  za  zi  zu  ze  zo
   Phonetic/Hepburn sa  shi  su  se  so  za  ji  zu  ze  zo

2. Phonemic
ta  ti  tu  te  to  da  di  du  de  do
   Phonetic/IPA ta  ci  tsu  te  to  da  zi  du  de  do
   Phonetic/Hepburn ta  chi  tsu  te  to  da  ji  zu  de  do

The transcription of the other consonants follows the pattern for the alveolar and prepalatal consonants.

1.2 The relation between syntax and phonology

Regarding the relation between syntax and phonology, I follow Selkirk (1984) in which the surface syntactic structure of a sentence relates to its phonological representations in a unidirectional fashion:
The F-structure in the diagram is the structure mediating the relation between intonational structure and focus-related intonational meaning (Selkirk 1984). This matter will be further discussed in the chapter on focus marking. The unidirectionality of the relation between surface syntactic and focus structure and phonological representations in the diagram indicates that the prosodic structure P1 is derived or constrained by the surface syntactic and focus structure, and not the other way.

The organizational principles governing phonological phrasing can be stated with reference to the syntactic and focus structure of a sentence and/or in terms of the interrelationships between prosodic categories. The rules and constraints governing phonological phrasing differ from regular phonological rules and constraints in that the latter relate a phonological representation to another, and may refer only to the prosodic structure derived from a syntactic structure.

**Syntactic structure**

For the syntactic structure of Japanese, I follow Saito (1985) and others in the standard Generative framework. Specifically I assume the X'-theoretic distinction between lexical categories X's (such as nouns N's, verbs V's and adjectives A's) and phrasal categories XP's (such as noun phrases NP's, verb phrases VP's and adjective phrases AP's). In particular I assume that Japanese is configurational in sense that a verb V and its object NP form a verb phrase VP. The configurationality of Japanese is
supported not only by Saito (1985) and others in the Generative framework, but also by Gunji (1988) within the framework of Generalized Phrase Structure Grammar.

The lexical categories (such as nouns, verbs and adjectives) are open-class, free-standing lexical items. There are others which are closed-class and bound morphologically (as affixes) and/or syntactically (as function words that subcategorize for particular phrasal categories). There are two kinds of this sort: particles (called *joshi* in the traditional grammar) such as case markers and postpositions; and auxiliary verbal/adjectival suffixes (called *jodōoshi* in the traditional grammar). I will refer to the latter kind as auxiliary suffixes, hereafter. The difference between these two closed-class categories is that auxiliary suffixes inflect for tense and aspect, whereas particles do not.

Examples of case markers include the subject marker *-ga*, the object marker *-o* and the possessive *-no* in NP-*no* N ‘NP’s N.’ Examples of postpositions include *-ni* ‘to’ and *-kara* ‘from’ (bound to a nominal or verbal gerundive stem) and *-kara* ‘because’ (bound to a verb/adjetive stem). Examples of auxiliary suffixes include the adjective forming *-roshī* ‘-seem’ suffixed to a noun, verb or adjective stem.

The difference between case markers and postpositions is that the former express grammatical relations whereas the latter do not. On the surface, these two kinds of particles can be distinguished by whether they can be followed by the topic/contrastive marker *-wa*: postpositions can be followed by *-wa* whereas case markers cannot be.
I assume that the differences between case markers and postpositions derive from the fact that the former result from Case assignment, whereas the latter are of the lexical category P. With this assumption, I will represent case marked noun phrases as NP’s, and noun phrases followed by a postposition as PP’s throughout this dissertation.

**Prosodic structure**

Regarding the prosodic categories in Japanese at the level of P1 in (4), I follow Pierrehumbert and Beckman (1988), who assume four levels of prosodic organization: the utterance, the intermediate phrase, the accentual phrase and the phonological word:
This hierarchical structure represents the claims of the theory of the Prosodic Hierarchy developed in Selkirk (1978, 1980, 1984), Nespor and Vogel (1986), Hayes (1989), among others. The theory claims that a prosodic hierarchy consists of a small number of prosodic constituents. These constituents are organized into a nonrecursive hierarchy distinct from syntactic structure; and they serve as domains for phonological rules and constraints (such as the alignment of tones with phonological phrase edges.)

The highest level of organization in the hierarchy is the utterance. In this dissertation, I assume that the utterance coincides more or less with a syntactic sentence. Further research is necessary to verify this assumption. The relation between the other prosodic categories and the surface syntactic structure of a sentence is the major concern of this dissertation, and will be explicated in each chapter of this dissertation.

The rest of this chapter concerns the tonal and intonational characteristics of the prosodic phrases in Japanese, characterize and formalized in the theory of Underspecification of Pierrehumbert and Beckman (1988).
1.3 **Tonal and intonational characteristics of prosodic categories in Japanese**

1.3.1 **Theoretical framework: English intonation**

Intonation is a pitch contour aligned with a linguistic text. The same linguistic text can be associated with various pitch inflections in declaratives and yes/no questions. Since various intonational inflections may be associated with the same text, it seems reasonable to assume that they are independent from the linguistic text. It is also reasonable to assume that an intonational contour consists of discrete tonal segments, H's and L's. With these assumptions, we can say that the objective of our study on intonation is to understand the principles governing sequences of tonal segments and their alignment with linguistic text.

Within the framework of Pierre Humbert (1980), an intonational contour is represented as a sequence of tones aligned with stressed syllables and boundaries. The tones aligned with stressed syllables are called *pitch accents*, and represented with an asterisk. The tones aligned with edges of prosodic phrases are called *boundary tones*. For example, in English, the verb in the sentence *John left* is stressed by the rule which stresses the rightmost phrasal category. The following are the representations of this sentence in declarative intonation whose tune is H* L, and in yes/no question intonation whose tune is L* H:

```
7  John  léft. ]  John  léft? ]
  |  |  |  |
  H*  L  L*  H
```
In these representations, the pitch accents H* and L* are aligned with main stressed syllables, and the boundary tones L and H with the sentence-final edges in declarative and question intonation, respectively.

Pitch accents can be bitonal in English and many other languages. For example, the pitch accent L*+H is a tone sequence representing a low pitch followed by a sharp pitch rise. The following is the representation of the sentence *Johnny didn’t come* with this pitch accent associated with the main stressed syllable:

8  [ [ Johnny ] didn’t come. ]
   |   |
   L*H  L  L

The following representation has a phrase-final H in place of the phrase-final L in (8), and has a different meaning: it questions the factual basis of the sentence:

9  [ [ Johnny ] didn’t come. ]
   |   |
   L*H  L  H

Unlike English, in pitch accent languages such as Japanese and Swedish (Bruce 1977), the inventory of pitch accents is restricted to a few: only H*+L in Japanese, and H*+L and H+L* in Swedish. The pitch accent H*+L represents a high pitch aligned with the peak of the syllable, followed by a sharp pitch fall. The pitch accent H+L* represents a low pitch aligned with the peak of the syllable, preceded by a sharp pitch fall. In the next section, I will describe the tonal and intonational structure of Japanese in general, and its autosegmental characterization in particular.
I.3.2 Tonal structure in Japanese

In the following, the term *accent* will be used to refer to a culminative lexical property (represented by the accent mark) in pitch accent languages. In this usage, the accent is the direct counterpart to the stress in stress languages. The term *pitch accent* will be used to refer to a tone associated with stressed syllables in stress languages, and with accented syllables in pitch accent languages.

There are similarities and differences between stress in stress languages and accent in pitch accent languages such as Japanese and Swedish (Beckman 1986). 1) As with stress, words may be associated with at most one accent. 2) Unlike with stress, words can be unaccented. 3) Unlike with stress, any syllable in the word can be accented, and the location of the accent is a lexical property. 4) Unlike with stress, the number of possible pitch accents is just a few in general: only $H^*+L$ in Japanese; and $H^*+L$ and $H+L^*$ in Swedish.

The following illustrate accentual patterns of trisyllabic words in Japanese. In the following, the bar notation indicates the traditional description of tonal inflection. The last two words are followed by the subject marker *-ga*, to illustrate the difference between final-accented and unaccented forms:

10 Accent location and pitch contour in traditional description

<table>
<thead>
<tr>
<th>ิ no ti</th>
<th>ko kó ro</th>
<th>a ṭa má (-ga)</th>
<th>mi ya ko (-ga)</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘life’</td>
<td>‘heart’</td>
<td>‘head - subject’</td>
<td>‘capital city - subject’</td>
</tr>
</tbody>
</table>
I will illustrate the four characteristics of the accent with these forms. 1) Each word is associated with at most one accent. 2) There are unaccented words, such as the last word in (10). 3) Any syllable in a word can be accented, and the location of the accent must be specified lexically. There are four possible accent locations for the trisyllabic words in (10): initial, medial, final and unaccented. 4) The accent is associated with a sharp fall in pitch. Translated to tones, the accent is associated with $H^*+L$, and only $H^*+L$ is possible. The difference between the finally accented word and the unaccented word in (10) is manifest in the pitch fall on the subject marker in the finally accented word. Finally, we note that it is syllables that are associated with accents, and it is moras that are associated with tonal segments; that is, even when a syllable is bimoraic, a pitch accent can link only to the first mora of the syllable.

The tonal pattern emerges from the four trisyllabic forms in (10) summarized as follows. 1) The initial mora is high if the initial syllable is accented, and/or if it is long, for some speakers. 2) The pitch is high to the first mora of an accented syllable, then falls and remains low. Haraguchi (1977) represents this tonal pattern by associating moras with tonal segments in his autosegmental analysis. For example, the words in (10) are represented in his analysis as follows:

```
Haraguchi (1977)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>H</td>
<td>L</td>
<td>L</td>
<td>H</td>
</tr>
<tr>
<td>V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>L</td>
<td>a</td>
<td>t</td>
</tr>
</tbody>
</table>
| H |   | m | á | (|-g|)
|   |   | a | t |  |
|   |   |  | m | ya
|   |   |  |   | k | o
|   |   |  |   |   | (|-g|)
```

Note that every mora is associated with a tonal segment, and every tonal segment is associated with a mora. Also note that as in the traditional analyses,
Haraguchi does not represent any lowering at the beginning of an initially accented word. These two characteristics are criticized later by the underspecification theory of Pierrehumbert and Beckman (1988), which I will discuss in the next section.

1.3.3 **Underspecification theory: Pierrehumbert and Beckman (1988)**

Pierrehumbert and Beckman (1988) (henceforth PB) show that the autosegmental analysis of Haraguchi is inadequate with respect to tonal specification: it underspecifies the initial lowering of initially accented and/or long words, and it overspecifies the tonal segments associated with the moras of unaccented syllables.

To prove the presence of initial lowering in initially accented and/or long words, PB contrast the phrase *amai ume* 'sweet plum' with the phrase *amai úni* 'sweet sea-urchin.' The first phrase consists of two unaccented words, whereas the second phrase consists of an unaccented word followed by an initially accented word. The following are the pitch tracks of these phrases. Their autosegmental representations are diagrammed below the pitch tracks:

1) 'sweet plum'

\[
\begin{array}{c}

\text{[u4fa a m a i ] [u um e ]]}

\end{array}
\]

\[
\begin{array}{c}

\text{L H L H}

\end{array}
\]
2) ‘sweet sea-urchin’

The second word ǘni in the second phrase amai ǘni is initially accented. The pitch track of this phrase reveals a low pitch at the beginning of the second word. However, the autosegmental representation for the same phrase fails to represent this low pitch. Since a low pitch precedes every word, PB define the tonal pattern of an accentual phrase as follows. 1) Define the accentual phrase as a phrase with at most one accent. 2) Associate the pitch accent H*+L to the accented syllable. 3) Associate H and L to the left and right edges of the accentual phrase, respectively. 4) Finally, associate an L at the left edge of the utterance. The following is the initial representation of an accentual phrase:

13 Underlying representation of pitch accent and boundary tone alignment

```
[u]...a] [a \ V \ a] [a ...u]
L  L H  H* L  L H  L/H declarative/interrogative
```
14

1) Then, H links to the second mora, and L links to the initial mora if it is free:

\[
\begin{array}{c}
\text{a} \quad \text{a} \quad \text{V} \quad \text{a} \\
\text{LH} & \text{H*L} & \text{LH}
\end{array}
\]

2) If there is only one mora to the left of the accent:

\[
\begin{array}{c}
\text{a} \quad \text{a} \quad \text{V} \\
\text{LH} & \text{H*L} & \text{LH}
\end{array}
\]

3) If the initial syllable is accented (or if the initial syllable is long, for some speakers):

\[
\begin{array}{c}
\text{a} \quad \text{V} \\
\text{LH} & \text{H*L} & \text{LH}
\end{array}
\]

The L's in the representations in (14) are either the utterance-initial L or L's linked to the right edges of accentual phrases; and the H's are always H's linked to the left edges of accentual phrases. Because of this redundancy, I can use (and will use when the origins of these accentual phrase L’s and H’s are not relevant) the following simplified representations for the tonal alignment in (14):
In the representations in (15.2) and (15.3), the H doubly linked to a pitch accent H*L is not represented, since the missing H in the L-H*L sequences in (15.2) and (15.3) can be recovered unambiguously; and phonetically, it does not seem likely that an H*L can be distinguished from an HH*L when linked to a single mora.

The inadequacies of Haraguchi’s autosegmental analysis

Haraguchi’s autosegmental analysis is inadequate with two respects: it underspecifies certain tonal inflections; and it overspecifies other inflections. Compare the following tonal representations by Haraguchi and Pierrehumbert/Beckman:
1) 'sweet plum'

\[
\begin{array}{c}
\text{[a] \text{ma} \text{i} [a] \text{ume}]}
\end{array}
\]

Haraguchi

Pierrehumbert/Beckman

2) 'sweet sea-urchin'

\[
\begin{array}{c}
\text{[a] \text{ma} \text{i} [a] \text{uni}]}
\end{array}
\]

Haraguchi

Pierrehumbert/Beckman

1. There is no distinction between H's and H*'s in Haraguchi’s representation (when there is a phonetic difference between the two tones), whereas PB distinguish them by interpreting H*'s higher than H's.

2. Observe the low pitch preceding the initially accented word \textit{uni} in (16). Haraguchi fails to represent this low pitch preceding an initially accented and/or long syllable, whereas PB represent it by the accentual phrase L.

3. Haraguchi fails to distinguish the utterance-initial L, the L linked to the initial mora of \textit{ume} and the L preceding the accented word \textit{uni}. In PB’s system, the utterance-initial L is an \textit{L linked to a mora and the utterance boundary}. The L linked
to the initial mora of *ume* is an *L linked to a mora and an accentual phrase boundary*. The L preceding *uni* is an *L linked only to an accentual phrase boundary*. Therefore, these three can be distinguished by interpreting L’s linked to moras lower than L’s linked only to boundaries; by interpreting L’s linked to the utterance boundary lower than L’s linked to the intermediate phrase boundary; and by interpreting L’s linked to the intermediate phrase boundary lower than L’s linked to the accentual phrase boundary.

These three inadequacies of Haraguchi’s analysis are due to its underspecification for the pitch inflections on accented moras and at the phrasal edges. The last inadequacy of his analysis is that it overspecifies the pitch inflections for the moras of unaccented syllables by means of H spreading. The following is the autosegmental representation of the unaccented word *miyako(-ga)* in (10):

17 Haraguchi (1977) mi ya ko (-ga)

\[ \text{L} \quad \text{H} \]

This representation predicts a level high pitch inflection on the second and following moras. However, in a series of pitch tracks, PB show that the pitch level from the first H to the last L in the series represented as \( H \ldots H \) \( L \) in Haraguchi’s analysis is not a level high pitch followed by a sharp pitch fall, but it is a gradual decline from the first mora to the last. Moreover, the decline rate is a function of the distance between the first H and the last L: the greater the number of H’s, the greater the decline from the first H to the last L in the sequence \( H \ldots H \) \( L \).
The following are the phrases used by PB to show the variable decline rates in the sequence \( H \ H \ldots \ H \ L \). They are sequences of unaccented words of variable length, followed by an accented word:

18

mori-no omáwari-san 'forests' policeman'
Moriya-no omáwari-san 'the Forests' policeman'
Moriyama-no omáwari-san 'the Moriyama's policeman'
Moriya-no niwa-no omáwari-san 'the Forests' yard's policeman'
Moriya-no mawari-no omáwari-san 'the Forests' neighborhood policeman'

The following are the Haraguchi’s and PB’s representations for these phrases:

19 Haraguchi’s and PB’ representations of (18)

\[
\begin{array}{c}
\text{mor} \ldots \text{no omáwari-san} \\
\text{L H} & \text{L H} & \text{L} \\
\text{L H} & \text{L H*L} & \text{L}
\end{array}
\]

Haraguchi

Pierrehumbert/Beckman

In PB’s system, the pitch for tonally underspecified moras is realized via interpolation between flanking target tones. For example, the pitch curve between the second mora to the pretonic mora (linked to the L preceding the pitch accent) in (19) results from interpolation between the \( H \) linked to the second mora and the \( L \) linked to the pretonic mora.

The following pitch tracks for the first and the last phrases in (18) verify the inadequacy of Haraguchi’s system:
Pitch tracks for the first and the last phrases in (18)

1)

... mori no o mawari san...

L  H  L  H  L

L  H  L  H*L  L

Haraguchi

Pierrehumbert/Beckman

The lines in these pitch tracks represent the regression line from the first H to the L preceding the accent.

Haraguchi’s representation \( HH \ldots HL \) from the second mora to the pretonic mora incorrectly predicts a level high pitch followed by a sharp pitch fall at L, whereas PB’s system correctly represents it to be a gradual decline from the first mora to the L preceding the pitch accent by means of interpolation. Also PB’s system can (but Haraguchi’s system cannot) account for the fact that the decline rate is a function of the distance between the second mora to the L preceding the pitch accent; the greater
the number of moras, the greater the decline from the second mora to the \( L \) preceding the accent.

### 1.4 Catathesis and focus: relevance to intermediate phrasing

Pierrehumbert and Beckman investigated four types of pitch downtrends on the basis of the results in Poser (1984): declination, final lowering, catathesis and the effect of focus. *Declination* refers to a steady fall of pitch over an utterance. *Final lowering* refers to a sharper decline in pitch in the final part of an utterance, at least in declaratives. The domain of these two effects is the utterance.

*Catathesis* refers to the lowering of the pitch of the high register line following each pitch accent. The high register line represents the pitch level of a pitch accent, and the pitch level of every tone is interpreted with reference to the high register line. Hence, the lowering of the high register line due to catathesis results in lowered pitch levels for all tones subsequent to the trigger pitch accent. The following illustrates the exponential lowering effect of catathesis triggered by each pitch accent:

\[
\begin{array}{c}
\text{high register} \\
\text{low register} \\
\text{accents}
\end{array}
\]

\[
| \bar{V} | \bar{V} |
\]

As indicated in the schematic representation in (21), the lowering effect due to catathesis is exponential, in that the relation between the pitch level \( P_i+1 \) of the high register line in catathesis and the pitch level \( P_i \) of the preceding high register line is such that \( P_i+1 = k \cdot P_i \) with \( k \) being the percentage of lowering due to catathesis.
Catathesis is triggered by a pitch accent. The following pair of AP-N phrases with an accented A and an unaccented A shows the correlation between catathesis and the presence of a pitch accent:

1) \([\text{tasty beans - topic (there isn't)}] \)

2) \([\text{sweet beans - topic (there isn't)}] \)

The pitch level of the pitch accent preceded by the accented adjective is lower (due to catathesis) than the pitch level of the pitch accent preceded by the unaccented adjective.

The domain of catathesis is the intermediate phrase. The following pair of NP-N phrases show that the presence of an intermediate phrase boundary blocks catathesis:
Domain of catathesis

1) imootó-no mari-ga ‘(my) younger sister-of ball-subject
   = the ball which is my sister’s’

2) imootó-no Mári-ga ‘(my) younger sister-of Mari-subject
   = Mari, who is my sister’

The difference in intermediate phrasing between these two NP-N phrases is due to the syntactic and semantic difference between these phrases. Given the intermediate phrasing difference in (23), the pitch inflections in (23) indicate that catathesis breaks where an intermediate phrase breaks. That catathesis breaks indicate intermediate phrase breaks is an effective diagnostic for determining the patterns of intermediate phrasing. This is the reason why the examples given in this dissertation involve mostly accented words only.

Defocusing. Another lowering effect delimited by intermediate phrase breaks is the effect due to focus marking. It is triggered by a focus constituent; it lowers the high register line after a focus constituent; and its domain is the intermediate phrase.
will refer to the lowering effect due to focus marking as *defocusing*, since it makes the material following a focus constituent less prominent in pitch than the focus constituent. The sense in which defocusing is delimited by intermediate phrase breaks is that a focus constituent must be preceded by a left intermediate phrase boundary. In other words, every focus must be the leftmost constituent of some intermediate phrase.

The sense in which the domain of defocusing is the intermediate phrase is that the presence of a focus constituent dictates a particular intermediate phrasing pattern, exactly the same way as a certain syntactic/semantic structure requires a particular intermediate phrasing pattern. The sense in which the domain of catathesis is the intermediate phrase, however, is that the intermediate phrase pattern of a sentence (determined by its syntactic and focus structure) dictates a particular catathesis break pattern.

1.5 Intonational characteristics of phonological phrases at various levels

In the hierarchical structure in (6), the phrases at all but the phonological word level are intonational, in the sense that only the utterance, the intermediate phrase and the accentual phrase serve as domains of tonal alignment.

The utterance is the highest level of organization. It is the domain of declination. Final lowering occurs in the final part of the utterance in declaratives, whereas it is suppressed in interrogatives. (In this dissertation, I assume that the utterance category in the prosodic hierarchy coincides more or less with a syntactic sentence. Further research is necessary to verify this assumption.)
At the phrasal level below the utterance is the intermediate phrase. The intermediate phrase serves as the domain of catathesis, in the sense that the lowering effect triggered by a pitch accent is delimited by intermediate phrase breaks. The focus structure of a sentence requires a particular intermediate phrasing pattern in which every focus must be the leftmost constituent of some intermediate phrase. The presence of a focused constituent also dictates a lowering of the high register line for the text following the focused constituent.

At the level below the intermediate phrase is the accentual phrase. The accentual phrase can have at most one accent, and it is preceded by an L linked either to the right edge of the preceding accentual phrase or to the left edge of the utterance. The following are the representations of accentual phrases with an accent on the initial syllable, on the second syllable and on/after the third syllable. Note how the initial L initiates the accentual phrase:

24 Accent on the initial syllable

\[
\begin{array}{c}
\ldots \ldots \ldots \quad a \quad {\hat{\cdot}} \ldots \ldots \quad a \quad \ldots \ldots \\
\mid \quad \mid \quad \mid \\
LH \quad H^{*}L \quad LH
\end{array}
\]

Accent on the second syllable

\[
\begin{array}{c}
\ldots \ldots \quad a \quad {\hat{\cdot}} \ldots \ldots \quad a \quad \ldots \ldots \\
\mid \quad \mid \quad \mid \\
LH \quad H^{*}L \quad LH
\end{array}
\]
Accent on/after the third syllable

\[ \ldots \ldots \ldots a] [a \ldots \ldots \tilde{V} \ldots \ldots a] [a \ldots \ldots \ldots] \]
\[ \begin{array}{c} \vdots \vphantom{[a]} \\ \text{LH} \\ \vdots \vphantom{[a]} \\ \text{H}^*\text{L} \\ \vdots \vphantom{[a]} \\ \text{LH} \end{array} \]

These three representations illustrate how the initial L marks the beginning of an accentual phrase, whether it links to a mora or a phrasal edge.

The smallest phrasal category is the phonological word. The phonological word is the domain of various lexical accent rules (Poser 1984). However, it is not intonational, in the sense that it does not serve as a domain of pitch inflection. It is the accentual and higher-level phrasal categories that serve as domains of pitch inflection.

The following summarizes the relation between various phrasal categories, excluding the phonological word:

\[ [u \ldots [i \ldots [a \ldots \ldots \tilde{V} \ldots \ldots] \ldots] \ldots [i \ldots [a \ldots \ldots \tilde{V} \ldots \ldots] \ldots] \ldots] \]

In this schematic representation, \([u\), \([i\) and \([a\) represent accentual phrase, intermediate phrase and utterance boundaries, respectively. These three phrasal categories are strictly and exhaustively layered within higher categories.
Chapter II

Focus and intermediate phrasing

It has been observed in many languages that the presence of focus within a sentence disturbs its phrasing. The presence of focus is cued by its different manifestations in different languages. In English, for example, focus is signaled by lengthening, stress, pitch prominence, expanded pitch range, etc. In some other languages, focus-related manifestations are too scarce or subtle to be amenable to casual observation, and the only reliable cue for focus is its special phrasing pattern, not observed in normal phrasing patterns. That focus is cued by its special phrasing patterns, however, is potentially a circularity, in that our objective is to show that focus disturbs the normal phrasing requirements, when the presence of focus is inferred by observing its special phrasing pattern. To avoid such circularities, we must know (at least informally) what focus is, and its semantic and functional properties at the discourse level; or at least, we must limit our attention to the only types of focus we know better.

In the first half of this chapter, I make explicit my assumptions regarding the definition and characteristics of focus, intending only to clarify the use and meanings of the terminology used in the subsequent focus-related discussions, rather than to support or falsify various theories of focus. Also discussed in this section is a level of representation (called focus structure) mediating the relation between intonational structure and focus-related meaning (Selkirk 1984).

In the second half of the chapter, I discuss various forms of focus realization in Japanese, including syntactic and prosodic ways of marking focus. The particular syntactic focus marking I discuss is scrambling. This does not mean that scrambling is the only syntactic form of focus marking, or that it does not have other functions. The
objective here is to emphasize the fact that prosodic focus marking is possible without any word order change. For prosodic focus marking, I discuss two mechanisms: I(ntermediate phrase)-focus marking and A(ccentual phrase)-focus marking. It is the I-focus marking that is most relevant to the optimality-theoretic account of intermediate phrasing in the next chapter.

II.1 The meaning of focus

The notion of focus has been variously characterized along such binary distinctions as between new and old information, comment and topic, rheme and theme, focus and presupposition, etc. However, these distinctions are not always semantic or functional, and may refer to the intonational characteristics of utterances. In Selkirk (1984), for instance, focus and focus structure are not strictly semantic and functional concepts; rather, they refer to a feature and a feature structure associated with pitch accents, the locations of which are determined by the speaker's intentions at the discourse level. Thus, it is the presence or absence, locations, distribution and choice of pitch accents, and not focus and focus structure, that the speaker directly controls at the discourse level.

In this dissertation, I follow Gussenhoven (1984) and Pierrehumbert and Hirschberg (1990) in their semantic and functional characterizations of focus, and follow Selkirk (1984) in her characterization of focus structure as a representation mediating between intonational structure and focus-related meaning.

Gussenhoven (1984) defines the semantic and functional structure of focus at the discourse level, in terms of the notions Variable and Background. The Variable, in his system, refers to a focused part of an utterance, and the Background to the sum of
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Gussenhoven (1984) defines the semantic and functional structure of focus at the discourse level, in terms of the notions Variable and Background. The Variable, in his system, refers to a focused part of an utterance, and the Background to the sum of
shared knowledge of the world resulting from a discourse. There are three ways the speaker can relate the Variable to the Background: adding a Variable to the Background; selecting a Variable from the Background; and testing the relevance of a Variable to the Background. In terms of the notions new vs. given information, the Variable in Variable Addition can be understood as new information, since it is not part of the Background, and the speaker adds it to the Background for the benefit of the speaker or hearer. The Variable in Variable Selection can be understood as given but salient information, since it is already part of the Background, but made salient (for the benefit of himself and/or the hearer).

The examples given in Gussenhoven (1984:19–20) for Variable-Addition, Variable-Selection and Variable-Testing are as follows:

1  V-Addition: The house is on fire
   H* L L%

V-Selection: The house is on fire
   H* L H%

V-Testing: The house is on fire
   L* H H%

For these examples, I used the tonal representations based on Pierrehumbert (1980), instead of the British notation Gussenhoven uses. Note also that we are not concerned with whether the tonal representation given for each semantic and functional category is the only tonal specification for that category. My intention here is that there are three semantic and functional categories, each of which can be exemplified by the tonal specification given here.
The example for V-Addition shows that the speaker lets the hearer know that he considers *the house is on fire* part of the Background. As to the reason for the selection of this manipulation, the speaker may have intended to use the sentence as a warning, or he ‘meant to signal to the hearer that he has just made an inference’ (Gussenhoven 1984:19). The example for V-Selection shows that the speaker lets the hearer know that *the house is on fire* is part of the Background. As to the pragmatic effects of this manipulation, the sentence ‘could be a reminder to the hearer that this Variable is in fact part of the Background, or an expression of surprise over the fact that it should be’ (Gussenhoven 1984:19). The example for V-Testing shows that the speaker leaves it to the hearer whether they should take this Variable as part of the Background. As to the pragmatic effects of this manipulation, the sentence could be a ‘request for information, requiring the hearer to either confirm or deny that this Variable is part of the Background, it could represent a tentative guess as to whether it is (part of the Background), or it could, again, signal surprise ’ (Gussenhoven 1984:19).

That given or old information can be focused (or made salient) is a contention not shared by some authors (including Selkirk 1984), who identify focus solely with new information. That such information can be focused, however, can be verified, for instance, by the following English sentences (Pierrehumbert and Hirschberg 1990):

\[
\begin{array}{llll}
\text{New information} & \text{My name is Mark Liberman? (To a receptionist)} \\
& \text{H* H* H H%}
\end{array}
\]

\[
\begin{array}{llll}
\text{Salient/old information} & \text{My name is Mark Liberman?} \\
& \text{L* L* H H%}
\end{array}
\]
In the first case, the H* pitch accents on Mark Liberman mark it as new information, and the speaker asks the hearer as to the relevance of this new information to the background beliefs which the speaker believes the hearer assumes. In the second case, the L* pitch accents on the old information Mark Liberman mark it salient, and the speaker leaves to the hearer the validity or incredulity of the predication 'My name = Mark Liberman.'

Another example of given but salient information is the distinction in Japanese between a focused topic phrase and its unfocused version. Observe:

3
1) \[ [i \text{ Mári-wa} ] \|^i \text{ kimasén désita} \]  
\[ \text{Mari-topic} \text{ did not come} \]  
'As for Mari, she did not come.'

2) \[ [i \text{ Mári-wa} ] \] \[^i \text{kimasén désita} \]  
\[ \text{Mari-topic} \text{ did not come} \]  
'As for Mari, she did not come.'

(The fact that a focused constituent is always preceded by an intermediate phrase break will be discussed shortly.) The subject Mári is the topic in each case; hence it is part of the Background shared by the speaker and the hearer. Marking the topic in the second sentence would be appropriate when the speaker lets the hearer know that another individual, Naoko, known to the speaker and the hearer, came (to the party) but Mari did not.

Finally, I indicate a few particular areas in which I follow different assumptions from Gussenhoven (1984). The first has to do with what focus marks. Gussenhoven claims that focus marks semantic material, and not syntactic constituents or words. The example he cites is a context in which the word spinster is used in contrast with the word bachelor. Gussenhoven claims that it is the semantic
feature FEMALE, and not the word *spinster*, that is in focus (Gussenhoven 1984:15).

I assume that there must be a level at which focus is realized contrastively, and this level is the word level. For example, the word *spinster* with its semantic feature FEMALE being focused, and the same word with its semantic feature HUMAN being focused result in the same form with the same stress pattern at the word level. It follows that whether assuming that focus marks semantic features or words would not be realized contrastively. For this reason, I assume that it is the word level that is relevant to focus marking.

Another point Gussenhoven makes is that every sentence is marked for focus: there is no sentence that is neutral in focus. To verify this contention, however, would require us to understand not only the behavior of narrow/contrastive focus, but also that of broad/phrasal focus. Since my main concern is the effect of narrow/contrastive focus on intermediate phrasing, I will refrain from discussing this matter. The only assumption I make in this regard is that a sentence can exist without any narrow/contrastive focus.

*Focus structure: Selkirk 1984*

Following Jackendoff (1972), Selkirk (1984:199) ‘view(s) the relation between intonational structure and focus-related intonational meaning as being mediated by a representation’ that she calls *focus structure*. Consider the following two syntactic structures:
S1

NP    VP1

N    V    NP1
I    have

NP2    F(S2)

N    to    F(VP2)

instructions

F(V)

LEAVE

F(S1)?

NP    F(VP1)

N    V    F(NP1)
I    have

N    F(S2)

instructions

NP2    F(S2)

F(VP2)

F(V)

LEAVE

F(VP2)

LEAVE

instructions
In the first sentence, the *to*-phrase is a relative clause, and the sentence means 'I am to leave instructions.' In the second sentence, the *to*-phrase is a complement structure, and the sentence means 'I have been instructed to leave.' The prominence on the verb *leave* in each case is due to a pitch accent assigned to it.

The F(X) and F(XP) in these representations indicate that the lexical category X and the phrasal category XP are focused. There are two focus rules that derive these focus structures: the lexical category that is assigned a pitch accent is focused; any category is focused when its head or an argument of the head is focused. In the relative clause structure, the verb is focused since it is associated with a pitch accent. VP2 is focused since its head, the verb, is focused. S2 is focused since the argument of its head, VP2, is focused. NP1 is not focused, however, since although S2 is focused, S2 is neither the head or an argument within NP1. In the complement structure, V, VP2 and S2 are focused for the same reason as in the relative clause structure. NP1 is also focused since the argument of its head, S2, is focused. VP1 and, possibly S1 as well, are focused for the same reason.

The difference in F-structure between these two syntactic structures implies that the sentence *I have instructions to LEAVE* with *to LEAVE* being a relative clause can be interpreted with *LEAVE* or *to LEAVE* being focused, whereas the sentence with *to LEAVE* being a complement can be interpreted with *instructions to LEAVE*, *have instructions to LEAVE* and, possibly, *I have instructions to LEAVE* (as well as *to LEAVE* and *LEAVE*) being focused. That differences in focus interpretation can be explained by their differences in F-structure argues for the validity of the notion of *focus structure.*
According to Selkirk (1984), the representations with F-structure in (4) are structures derived from S-structure via the lexical and phrasal focus rules that assign focus on the basis of (prior) pitch accent assignment. Although the structures in (4) represent the scope relations among focused constituents, they must be further interpreted in terms of new and given information at LF.

The analysis in (4) embodies four claims. First, the relation between intonational structure and focus-related meaning is mediated by focus structure. Second, the distinction between narrow and broad foci is represented by the distinction between F(X) and F(XP), in which X and XP are lexical and phrasal categories, respectively. Third, the relation between a focused constituent X and another focused constituent Y, which dominates X, is such that X is either the head of Y, or it is an argument of the head of Y. Fourth, pitch accent assignment (to a lexical category) logically precedes F-structure assignment. In this analysis, it is pitch accent assignment, and not focus structure, that reflects the speaker's (focus) intentions at the discourse level.

Regarding the last claim (on the precedence of pitch accent assignment to focus assignment), I cannot apply this view to Japanese, in which the presence or absence and the loci of pitch accents are lexically determined. Therefore, I assume that it is F-structure, and not pitch accent assignment, that directly reflects speakers' (focus) intentions at the discourse level. Otherwise, I follow Selkirk in her characterization and representation of focus and F-structure. This modified version of Selkirk's view can be summarized as follows. 1) F-structure directly reflects speakers' (focus) intentions at the discourse level, and it is interpreted semantically and functionally at LF. 2) Regarding the internal makeup of F-structure, I assume the
following version of Selkirk’s Basic and Phrasal Focus Rules (Selkirk 1984:207), stated as a constraint on the relations between focus constituents, without any reference to pitch accents:

5 Focus Layering Principle

For any focus constituent F(X), either X is a phonological word, or F(X) directly dominates another focus constituent F(Y), such that Y is the head of X, or an argument of the head of X.

The reason for stating this principle in terms of phonological words is that phonological words are the smallest prosodic category that can be focused contrastively. (Later I show that a focused constituent must be preceded by an intermediate phrase boundary, and it is the phonological words that can be minimally contrasted in focus intermediate phrasing.)

Narrow and broad focus

As has been extensively discussed in the literature, there is a distinction between narrow and broad focus (and polarity focus). In terms of Selkirk’s focus structure, the distinction between narrow and broad foci is expressed by the distinction between F(X) and F(XP), where X and XP are lexical and phrasal categories. In this dissertation, I assume the existence of the level of focus structure, and the distinction between F(X) and F(XP). However, there is much we do not know about broad focus, its realization and its effect (if any) on intermediate phrasing in Japanese. Therefore, I exclude the matters concerning broad focus mostly from discussion in this dissertation.
Multiple foci

The cases of narrow focus I discuss in the present and next chapters include cases of multiple foci. A typical example of multiple foci discussed in the latter half of this chapter is the case of multiple wh-phrase sentences, where each wh-phrase is focused obligatorily. It is in these multiple-focus cases that the ranking relationship between two focus-related constraints can be determined. More will be said regarding this issue in the next chapter.

Summary

To summarize, I follow Gussenhoven (1984) and Pierrehumbert and Hirschberg (1990) in their semantic and functional characterizations of focus: Variable addition (new information), Variable selection (salient old information) and Variable testing. In addition, I assume that the level of focus marking and realization is the (phonological) word, and that a sentence can occur without any (narrow) focus. The only type of focus made use of throughout this dissertation is narrow/contrastive focus, with a possibility of multiple foci. Finally, I assume Selkirk's focus structure as a representation mediating the relation between intonational structure and focus-related intonational meaning. I also assume that such F-structure is in a direct relationship with the speaker's intentions at the discourse level.

The discussion that follows is concerned with two ways constituents can be marked for focus prosodically: I(intermediate phrase)-focus marking, and A(centual phrase)-focus marking. These mechanisms are called prosodic, in that they require special prosodic phrasing patterns: special intermediate phrasing and accentual phrasing patterns for I- and A-focus marking, respectively.
Prosodic focus mechanisms contrast with syntactic mechanisms for focus marking. Scrambling is one such mechanism, with scrambled constituents being marked for focus. There are two important facets to scrambling that distinguish it from prosodic focus marking. 1) The focus marking via a scrambled structure is distinct from prosodic focus marking, in that the former derives its focus properties syntactic-structurally (and not from F-structure), and has no special intermediate phrasing patterns associated with it, whereas the latter derives its focus interpretation from F-structure, and has its own intermediate phrasing patterns. 2) The focus interpretation associated with F-structure overrides the focus interpretation associated with scrambled structures. These two aspects of scrambling will discussed fully at the end of this chapter, and in the next chapter. The point that prosodic focus marking via F-structure overrides the focus interpretation associated with scrambling can be made more easily in the next section, where various phrasing constraints are ranked in a hierarchy.

II.2 Prosodic focus marking: I-focus marking

In this section, I will explore the possibility of focus marking by directly altering the accentual and intermediate phrasing patterns in certain prescribed ways. I will discuss, first, the effect of intermediate phrasing alteration, then the effect of accentual rephrasing, on focus interpretation.

The most important aspect of focus and its effect on intermediate phrasing is that focus phrasing overrides the normal phrasing requirements. To describe how focus overrides the normal phrasing requirements, we must know what are the requirements for normal phrasing. Selkirk and Tateishi provide an answer to this.
Selkirk and Tateishi (1988, 1991) propose the following parameter setting for intermediate phrasing, in accord with the edge-based phrasing principle in Selkirk (1986):

Selkirk and Tateishi (1991:529)

Major Phrase (= Intermediate Phrase): \{Left, XP\}

(This parameter setting will be referred to as XP-left-edge, hereafter.) This XP-left-edge parameter setting requires that left edges of intermediate phrases be aligned with left edges of XP’s. The following illustrates this phrasing principle:

Although the XP-phrasing principle accounts for a variety of syntactic structures, it is not without a shortcoming. The XP-phrasing principle cannot, for instance, account for the fact that the phrasing patterns associated with structures involving focus override the normal phrasing requirements prescribed by the XP-phrasing principle. To account for such and other cases, I propose in the following, a variety of phrasing constraints that would augment the XP-phrasing principle.

That focus phrasing overrides the normal phrasing requirements has been demonstrated in a number of languages (Cho 1990 (Korean), Condoravdi 1990
(Greek), Kanerva 1990 (Chichewa), among others). This is also true for Japanese. The following paradigm illustrates the overriding effect of focus phrasing:

**8 Focus phrasing**

**Syntactic structure**

```
[inp]Naoko wa [inp]nichiyóobi ] [pp]Nágoya dé ] [pp]Mári ní] [áatta ]
Naoko topic Sunday Nagoya at Mari with met
```

**Normal intermediate phrasing**

1) 
```
[Naoko wá] [nichiyóobi ] [Nágoya dé ] [Mári ní áta]
"Naoko met with Mari in Nagoya (last) Sunday."
```

**Focus intermediate phrasing**

2) 
```
[Naoko wá] [nichiyóobi ] [Nágoya dé ] [Mári ní] [áta]
"Naoko met with Mari in Nagoya (last) Sunday."
```

3) 
```
[Naoko wá] [nichiyóobi ] [Nágoya dé ] [Mári ] [ní átta]
"Naoko met with Mari in Nagoya (last) Sunday."
```

4) 
```
[Naoko wá] [nichiyóobi ] [Nágoya ] [dé Mári ní átta]
"Naoko met with Mari in Nagoya (last) Sunday."
```

5) 
```
[Naoko wá] [nichiyóobi ] [Nágoya dé ] Mári ní átta]
"Naoko met with Mari in Nagoya (last) Sunday."
```

6) 
```
[Naoko wá] [nichiyóobi Nágoya dé Mári ní átta]
"Naoko met with Mari in Nagoya (last) Sunday."
```

7) 
```
[Naoko ] [wá nichiyóobi Nágoya dé Mári ní átta]
"Naoko met with Mari in Nagoya (last) Sunday."
```

8) 
```
[Naoko wá nichiyóobi Nágoya dé Mári ní átta]
"Naoko met with Mari in Nagoya (last) Sunday."
```

The focus readings translated to English in (8.2) through (8.8) are cases of narrow focus on lexical categories, and case markers and postpositions.

The intermediate phrasing pattern in (8.1) is normal in three ways. First, it is the citation phrasing pattern given when one asks a native speaker to read the
sentence. Second, there is no (narrow) focus reading possible in (8.1), whereas there is, for each phrasing pattern in (8.2) through (8.8). Third, (8.1) is the phrasing pattern prescribed by the XP-left-edge constraint proposed by ST.

The phrasing patterns in (8) show that the focus phrasing patterns in (8.2) though (8.8) override the normal phrasing pattern in (8.1) prescribed by ST’s XP constraint. That focus phrasing overrides not only the requirements prescribed by ST’s XP constraint, but also all the other constraints will be substantiated in the next section on the hierarchical/ranking relationships among these constraints.

In focus phrasing, breaks can occur preceding case markers and postpositions, as in (8.3), (8.4) and (8.7). If strict-layering is to be assumed, the only way to have an intermediate phrase break preceding case markers and postpositions is to suppose that there are also lower-level prosodic category breaks, including phonological word breaks. This means that case markers and postpositions must be phonological words. This is exactly what we expect from the claim (in the earlier chapter on phonological word formation) that free morphemes and morphemes lexically specified with a phonological word break preceding them constitute phonological words. According this criterion, case markers and postpositions are phonological words, since they are lexically specified with a phonological word juncture preceding them. Then, phonological words can be characterized not only as a union of free morphemes and morphemes with lexically specified junctures, but also as any lexical terms that can be contrasted or focused.

The requirements for well-formed focus phrasing can be expressed by two constraints: the focus-left-edge and focus-to-end constraints. The focus-left-edge constraint requires that the left edge of a focused constituent be aligned with a left
intermediate phrase boundary. The FOCUS-TO-END constraint requires that there be no intermediate phrase boundary intervening between any focus constituent and the end of the sentence:

9

1) FOCUS-LEFT-EDGE (Pierrehumbert and Beckman 1988)

   Left edge of focus = left intermediate phrase edge

2) FOCUS-TO-END

   No intervening \([i\) between any focus constituent and the end of sentence

When there is only one focus constituent per sentence, the effect of these two requirements is such that the left edge of the focus constituent is aligned with a left intermediate phrase boundary \([l), and no intermediate boundary intervenes between \([l) and the sentence-final \(j). This is illustrated by the following schematic representation:

10 Single focus

\[
\text{focus} \quad \text{left intermediate phrase boundary} \quad \text{sentence-final}
\]

Examples of single focus phrasing are given in (8). Note that (10) merely specifies the phrasing requirement for the material extending from the focus constituent to the end of the sentence; and it does not specify the phrasing pattern to the left of the focus constituent. To the left of the focus, the phrasing pattern is correctly prescribed by the Selkirk and Tateishi's XP-left-edge constraint. In other words, the phrasing pattern for a single focus is exactly as prescribed by the XP-left-
edge constraint, except that the focus phrasing requirements (prescribed by the two focus constraints) dictate phrasing over the text extending from the focus to the end of the sentence.

When a sentence has multiple focus constituents, its phrasing is exactly as prescribed by the two constraints in (10), except that only the rightmost focus constituent realizes the inclusive phrasing pattern set by the FOCUS-TO-END constraint. The following is a schematic representation of the phrasing pattern for multiple foci:

11 Multiple foci

\[ \ldots \text{focus1} \ldots \text{focus2} \ldots \]  
\[ [i_1 \quad [i_2 \quad \frac{\text{No intervening }}{i}] \quad i_2] \quad i_1 \]

Note that the phrasing pattern in (11) is exactly like (10) as far as the rightmost focus, focus2, is concerned. For any focus preceding the rightmost focus has an intermediate phrase break at its left edge, but does not extend its right phrasal edge to the end of the sentence. The following is a paradigm with two foci at various lexical constituents:

12 Intermediate phrasing with two foci

1) \[ [i \quad \text{Nagoya} \quad ] \quad [i \quad \text{de} \quad \text{Mari} \quad ] \quad \text{nf} \quad \text{atta} \quad ] \]
   ‘(I) met with Mari in Nagoya.’

2) \[ [i \quad \text{Nagoya} \quad \text{de} \quad ] \quad [i \quad \text{Mari} \quad ] \quad \text{nf} \quad \text{atta} \quad ] \]
   ‘(I) met with Mari in Nagoya.’

3) \[ [i \quad \text{Nagoya} \quad \text{de} \quad ] \quad [i \quad \text{Mari} \quad ] \quad [i \quad \text{nf} \quad \text{atta} \quad ] \]
   ‘(I) met with Mari in Nagoya.’

4) \[ [i \quad \text{Nagoya} \quad \text{de} \quad ] \quad [i \quad \text{Mari} \quad \text{nf} \quad ] \quad [i \quad \text{atta} \quad ] \]
   ‘(I) met with Mari in Nagoya.’
Note that some of the phrasing patterns in (12) are indistinguishable from their single-focus versions. Observe the following four (identical) phrasing patterns associated with various focus possibilities:

13  Identical intermediate phrasings with different F-structures

1) \([i\ Nágoya\ de\ ][i\ Mári\ ní\ átta\ ]\)
   ‘(I) met with Mari in Nagoya.’

2) \([i\ Nágoya\ de\ ][i\ Mári\ ní\ átta\ ]\)
   ‘(I) met with Mari in Nagoya.’

3) \([i\ Nágoya\ de\ ][i\ Mári\ ní\ átta\ ]\)
   ‘(I) met with Mari in Nagoya.’

4) \([i\ Nágoya\ de\ ][i\ Mári\ ní\ átta\ ]\)
   ‘(I) met with Mari in Nagoya.’

These identical phrasing patterns can be disambiguated by certain auxiliary processes operative within a focus intermediate phrase. These processes include collapsing the accentual phrases into a single accentual phrase within a focused intermediate phrase;
assigning a higher pitch range to a focused intermediate phrase; and compressing the
pitch range after a focus word within a focus intermediate phrase. There is much we
do not know about these processes, however. We do not even know whether or not
they are distinct, categorial processes. Some of these auxiliary processes will be
discussed in the next section, A-focus marking.

The phrasing patterns in (12) are exactly as prescribed by the XP-left-edge
constraint except at the left edges of focus constituents, and between the rightmost
focus and the end of the sentence. At the left edges of focus constituents, focus
phrasing requires that there be an intermediate phrase break; and there be no
intermediate phrase break between the rightmost focus and the end of the sentence.

The presence of phrasing breaks at the left edges of focused constituents is
specified by the FOCUS-LEFT-EDGE constraint in (9). The absence of phrasal breaks
between the rightmost focus and the end of the sentence is specified by the FOCUS-TO-
END constraint. However, for any focus preceding the rightmost focus, the FOCUS-TO-
END constraint is always violated, since it requires that there be no intermediate phrase
break between every focus constituent and the end of the sentence.

Of course, the FOCUS-TO-END constraint can be reformulated so that it applies
only to the rightmost focus constituent. However, there is reason to believe that an
analysis based on the more general formulation in (9) is not only possible but
desirable. I will give such an analysis in the next chapter. For the moment we note
just how ill- and well-formed phrasing patterns violate the two focus constraints as
formulated in (9). Consider the following transitive sentence with focus on the object
N and the verb:
```
14 subject object V

[NP Mári-ga ] [NP Náoko-ni ] [v áu ] ‘Mari will see Naoko.’

<table>
<thead>
<tr>
<th>Phrasing</th>
<th>F-LEFT</th>
<th>F-END</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>[i]</td>
<td>[i]</td>
</tr>
<tr>
<td>*</td>
<td>[i]</td>
<td>[i]</td>
</tr>
<tr>
<td>*</td>
<td>[i]</td>
<td>[i]</td>
</tr>
<tr>
<td>*</td>
<td>[i]</td>
<td></td>
</tr>
</tbody>
</table>
```

The underscore in (14) indicates focus. In (14) there are four possible phrasing patterns, Phrasing 1 through Phrasing 4, ignoring the cases of intermediate phrasal breaks at the left edges of particles. Only the first phrasing pattern is well-formed. Each phrasing pattern either obeys or violates each of the two focus constraints. The asterisk and slash notation indicates that the constraint in question is violated or is not, respectively.

Consider the FOCUS-LEFT-EDGE constraint, and the pattern of its violations by the four phrasing patterns in (14). Phrasing 1 is the only phrasing pattern which does not violate this constraint, since every focus constituent is (immediately) preceded by an intermediate phrase break. The other phrasing patterns violate FOCUS-LEFT-EDGE, since there is at least one focus constituent which is not preceded by an intermediate phrase break. (The double asterisk notation for Phrasing 4 indicates that there are two FOCUS-LEFT-EDGE violations for this phrasing pattern.)

As for the FOCUS-TO-END constraint, Phrasing 1 violates it with respect to the focus on the object N, Náoko, since there is an [i intervening between this focus and the sentence-final ]. For the focus on the verb, áu, in Phrasing 1, there is no violation of FOCUS-TO-END. Phrasing 3 violates FOCUS-TO-END for the focus on the object N,
since there is an [i intervening between this focus and the sentence-final ]f. There is no
FOCUS-TO-END violation for the focus on the verb in Phrasing 3. Phrasing 2 and
Phrasing 4 are the only phrasing patterns which do not violate FOCUS-TO-END for any
of its foci, since there is no intervening [i between every focus and the sentence-final

The pattern of constraint violations in (14) is such that any phrasing pattern
which violates the FOCUS-LEFT-EDGE constraint is ill-formed, whether or not it violates
the FOCUS-TO-END constraint at the same time. This analysis is essentially optimality-
theoretic, in that well-formed phrasing patterns are distinguished from ill-formed ones
on the basis of how they violate constraints (and not whether they violate them at all).
Note the difference between this analysis and the traditional analysis, in which ill-
formed phrasing patterns are ill-formed because they violate at least one constraint. If
we are to follow the latter analysis, we must reformulate the FOCUS-TO-END constraint,
so that it would not be violated by well-formed phrasing patterns. Let us reformulate
the FOCUS-TO-END constraint in such a way that it applies only to the rightmost focus
constituent. Apply this reformulated FOCUS-TO-END constraint to the phrasing patterns
in (14) to see the difference between this and the optimality-theoretic account given in
(14). In the following R-F-END refers to this reformulated version of the FOCUS-TO-END
constraint:

15 subject object V

[NP Mári-ga ] [NP Náoko-ni ] [v áu ] 'Mari will see Naoko.'
There is no violation of the \texttt{R-F-END} constraint by the phrasing patterns in (15), since there is no intermediate phrase break between the rightmost focus and the end of the sentence for every phrasing pattern. In this analysis, the ill-formed phrasing patterns in (15) are ill-formed because they violate at least one constraint.

The analysis given in the next chapter is optimality-theoretic; and the \texttt{FOCUS-TO-END} constraint in this analysis stands exactly as formulated in (15). The rationale for opting for an optimality-theoretic account is its capability of uniformly formalizing the hierarchical/overriding relationships between any two constraints, without resorting to writing such overriding relationships into individual constraints. More will be said about Optimality Theory and its application to intermediate phrasing in Japanese in the next chapter.

\textit{Obligatory focus marking}

I assumed at the beginning of this chapter that F-structure reflects the speaker's (focus) intentions at the discourse level. However, there are certain kinds of sentences whose F-structures are determined lexically and syntactically. Examples of such cases include wh-questions. Consider wh-questions with a single wh-phrase. Their intermediate phrasing patterns are such that the wh-phrase is preceded by a left intermediate phrase boundary, and there should be no intermediate phrase boundary between the wh-phrase and the end of the sentence. This phrasing pattern is exactly as
if wh-phrases are focused obligatorily. The following is exactly the same paradigm as (8) except that nouns and adverbials are replaced with wh-phrases:

16 Single wh-phrasing

1) \[
\begin{array}{l}
[\text{i Naoko} \text{ topic}] [\text{i \text{nichiyôbi}}] [\text{i \text{Nagoya}} \text{ at}] [\text{i \text{dare}} \text{ with}] \\
\text{Naoko topic Sunday Nagoya at who with met} \\
\end{array}
\]

`Naoko met with who in Nagoya (last) Sunday?`

2) \[
\begin{array}{l}
[\text{i Naoko} \text{ topic}] [\text{i \text{nichiyôbi}}] [\text{i \text{doko}} \text{ where}] \\
\text{Naoko topic last Nagoya where} \\
\end{array}
\]

`Naoko met with Mari where (last) Sunday?`

3) \[
\begin{array}{l}
[\text{i Naoko} \text{ topic}] [\text{i \text{itsu}} \text{ when}] \\
\text{Naoko topic last Nagoya when} \\
\end{array}
\]

`Naoko met with Mari in Nagoya when?`

4) \[
\begin{array}{l}
[\text{i Dare} \text{ subject}] [\text{i \text{ichiyôbi}}] [\text{i \text{Nagoya}} \text{ at}] [\text{i \text{Mari}} \text{ with}] \\
\text{Who met with Mari in Nagoya (last) Sunday.} \\
\end{array}
\]

Note that in the paradigm (8), each focus-phrased sentence has a normal, unfocused version. The focus-phrased sentence (8.8), for example, has the corresponding unfocused version, (8.1). In contrast, there is no unfocused version corresponding to each of the wh-questions in (16), since focus phrasing in wh-questions is obligatory. (Also note that in (16.4), the subject wh-phrase cannot be marked with the topic marker -wa, presumably because wh-phrases (which are focused) must be a case of Variable-Testing, and cannot be part of the Background, whereas topics must be part of the Background.)

When there is more than one wh-phrase per sentence, each and every wh-phrase is preceded by a left intermediate phrase boundary, and no intermediate phrase boundary intervenes between the rightmost wh-phrase and the end of the sentence. The following is a schematic representation for this phrasing pattern:
17 Multiple-wh-questions

\[ ... \text{wh-phrase} \cdots \text{wh-phrase} \cdots \text{wh-phrase} \cdots \] 

\( i \quad i \quad i_j \quad i \)

No intervening \([i \) between the rightmost wh-phrase and \( s \)]

The following is an illustration paradigm with multiple wh-phrases, derived from the paradigm in (8):

18 Multiple wh-phrasing

1) \([i \text{ Dáre } ga\] \( i \) \( \text{itsu} \) \( \text{Nágoya } dê \) \( \text{Mári } nî \) \( \text{átt}a \)]
   ‘Who met with Mari in Nagoya when?’

2) \([i \text{ Dáre } ga\] \( i \) \( \text{nichiyōobi} \) \( i \) \( \text{doko } dê \) \( \text{Mári } nî \) \( \text{átt}a \)]
   ‘Who met with Mari where (last) Sunday?’

3) \([i \text{ Dáre } ga\] \( i \) \( \text{nichiyōobi} \) \( i \) \( \text{Nágoya } dê \) \( i \) \( \text{dáre} \) \( nî \) \( \text{átt}a \)]
   ‘Who met with who in Nagoya (last) Sunday?’

4) \([i \text{ Náoko wá}\] \( i \) \( \text{itsu} \) \( i \) \( \text{doko } dê \) \( \text{Mári } nî \) \( \text{átt}a \)]
   ‘Naoko met with Mari where and when?’

5) \([i \text{ Náoko wá}\] \( i \) \( \text{itsu} \) \( i \) \( \text{Nágoya } dê \) \( i \) \( \text{dáre} \) \( nî \) \( \text{átt}a \)]
   ‘Naoko met with who in Nagoya when?’

6) \([i \text{ Náoko wá}\] \( i \) \( \text{nichiyōobi} \) \( i \) \( \text{doko } dê \) \( i \) \( \text{dáre} \) \( nî \) \( \text{átt}a \)]
   Naoko topic Sunday where at who with met
   ‘Naoko met with who and where (last) Sunday?’

(An ordinary focused NP can substitute for any of the wh-phrases, resulting in the same intermediate phrasing pattern.) That the phrasing pattern in multiple wh-phrase questions is exactly as if every wh-phrase is focused further supports the claim that wh-phrases are focused obligatorily.
Summary

There are two focus-related constraints: the FOCUS-LEFT-EDGE constraint requires the alignment of the left focus edge with a left intermediate phrase boundary; and the FOCUS-TO-END constraint requires that there be no intermediate phrase boundary intervening between any focused constituent and the end of the sentence. In the next chapter, I will give a formal analysis to account for how these two focus constraints together with other constraints, including the XP-left-edge constraint, circumscribe all and only well-formed phrasing patterns.

Manipulating the normal intermediate phrasing patterns is one way to achieve focus marking prosodically. The other is by altering the accentual organization for a given intermediate phrase. In the section that follows, I discuss this type of accentual rephrasing and its relation to I-focus marking.

II.3 Accentual rephrasing

Focused constituents must always head an intermediate phrase. I will call the intermediate phrase whose leftmost constituent is focused, the focused intermediate phrase. In this section, I deal with accentual rephrasing, which is a process in which the accentual phrases internal to a focused intermediate phrase are reorganized. The way the accentual phrase structure within a given focus intermediate phrase can be altered is given in (19):

19 Accentual rephrasing

For a given focused intermediate phrase (in which the focused word is the leftmost), rephrase all the accentual phrases into a single accentual phrase:
Like the accentual rephrasing in (19), such syntactic restructuring is an optional, auxiliary process that can enhance the focus effect. The discussion that follows describes the subtle difference between the single and multiple accentual phrase structures in (19). More will be said in the chapter on accentual phrasing.

### 2.4 Syntactic focus marking: scrambling

The discussion of syntactic focus marking in this section is intended neither to be a comprehensive survey of all possible syntactic mechanisms for focus marking, nor to give a thorough analysis for a scrambled structure. This section is merely intended to show that scrambling is one instance where focus is expressed syntactically, and only syntactically.

Following Saito (1985), I assume that scrambling is an instance of movement resulting in an adjunction structure of the form \([y x_j [y \cdots t_j \cdots]]\), in which \(x_j\) is a scrambled phrase and \(t_j\) is its coindexed trace. (Also see Gunji (1988) in which a scrambled structure is analyzed as a base-generated \([y x_j [z \cdots \cdots \cdots]]\) within the framework of Generalized Phrase Structure Grammar.) The following is one such example:

\[
\begin{array}{l}
[r\{Naoko-ga\}] [vp\{Mari-ni\}] [np\{kazoku-no shasin-o\}] [v\{miseta\}]\\
\text{Naoko-subject Mari-to family-of picture-object showed}\\
\text{‘Naoko showed a picture of her family to Mari.’}
\end{array}
\]
Although scrambling is associated with various syntactic and semantic functions, its primary function seems to be to make scrambled phrases salient or focused under certain circumstances at the discourse level. A most natural account for the association of a scrambled phrase with a focus interpretation is to assign the F-structure $[y \ F(x)] \ [y \ \ldots \ y \ \ldots]$ to the adjunction structure $[y \ x] \ [y \ \ldots \ y \ \ldots]$. However, such F-structure assignment would lead to incorrect intermediate phrasing patterns. Observe the following phrasing patterns for the scrambled sentence in (20):

1)  $[N\ \ldots \ N \ [k\ldots \)]$  $[k\ldots \]$  $[M\ldots \]$  
2)  $[N\ \ldots \ N \ [k\ldots \)]$  $[k\ldots \]$  $[M\ldots \]$  

There are two intermediate phrasing patterns possible for this scrambled sentence. The difference between these two phrasing patterns seems to be a (relatively) greater degree of emphasis for the second phrasing than the first. Otherwise, the scrambled phrase in each phrasing pattern is focused.

It should be noted, however, that the phrasing optionality in (21) cannot be attributed to the optionality of F-assignment to the scrambled phrase. Suppose that
such F-assignment is optional, for the sake of argument. Without F-assignment, the scrambled sentence in (21) should be phrased as (22):

22 Scrambled: without F-assignment

\[
\text{Naoko-subject family-of picture-object Mari-to showed}
\]

\[
\text{Naoko-ga [i kázoku-no shasin-o] [i Mári-ni míseta ]}
\]

Without F-assignment, the scrambled sentence results in a correct intermediate phrasing pattern. However, since there is no F-assignment, there is no focus on the scrambled phrase, incorrectly.

With F-assignment, the scrambled sentence in (21) should be phrased as (23):

23 Scrambled: with F-assignment

\[
\text{Naoko-ga [i kázoku-no shasin-o] [i Mári-ni míseta ]}
\]

With F-assignment, the scrambled phrase can be interpreted to be focused, correctly. However, there is no way to derive two intermediate phrasing patterns for this F-structure. Therefore, it is not correct to assume that it is the optionality of F-assignment, that derives the optional phrasing patterns in (21).

Likewise, it is not correct either to assume that it is the optionality of the FOCUS-LEFT-EDGE and FOCUS-TO-END constraints, that derives the optional phrasing patterns in (21). This is so because, if the these focus constraints are optional, we cannot explain the matching pattern between the presence of a focus and its obligatory

54
intermediate phrasing pattern, observed in an earlier section on I-focus marking. Therefore, we must assume that the FOCUS-LEFT-EDGE and FOCUS-TO-END constraints is obligatory, or that the presence of a focus necessarily correlates with its special phrasing pattern.

The only solution to this puzzle is to assume that the focus interpretation associated with scrambled phrases does not derive from F-structure. Suppose that the scrambled phrase $\xi$ in the adjunction structure $[y \xi [y \ldots \eta \ldots]]$ is interpreted to be focused not via F-structure, but via the syntactic configuration in which it is embedded. The following states this independence of the focus interpretations via F-structure from the syntactic-structural focus interpretations for scrambled structures:

24 F-assignment, focus interpretations and focus phrasing

Assign F() according to the Focus Layering Principle in (5) and the speaker's (focus) intentions within the requirements at the discourse level. The constituents assigned F() are interpreted to be focused.

Syntactic-structural focus interpretations

The $\xi$ in the configuration $[y \xi [y \ldots \eta \ldots]]$ is interpreted to be focused. Such syntactic-structural focus interpretations are not due to F-structure.

The following is a transitive sentence with its object scrambled to the beginning of the sentence. The following show four possible (single focus) F-assignment patterns, resulting from the application of F-assignment to the subject, the object, the verb, or no F-assignment:
Object scrambling

1) NP2 is focused syntactically

\[
\begin{align*}
[s \ NP2_j] & [s \ NP1] & [\iota \ \psi \ V]\\
[l_i \ NP2] & [l_i \ NP1] & [V]
\end{align*}
\]

2) NP2 is focused prosodically and syntactically

\[
\begin{align*}
[s \ F(NP2_j)] & [s \ NP1] & [\iota \ \psi \ V]\\
[l_i \ NP2] & [l_i \ NP1] & [V]
\end{align*}
\]

3) NP1 is focused prosodically; NP2 is focused syntactically

\[
\begin{align*}
[s \ NP2_j] & [s \ F(NP1)] & [\iota \ \psi \ V]\\
[l_i \ NP2] & [l_i \ NP1] & [V]
\end{align*}
\]

4) V is focused prosodically; NP2 is focused syntactically

\[
\begin{align*}
[s \ NP2_j] & [s \ NP1] & [\iota \ \psi \ F(V)]\\
[l_i \ NP2] & [l_i \ NP1] & [V]
\end{align*}
\]

The intermediate phrasing in (25.1) reflects the fact that there is no F(\) assigned to any phrase of the sentence; yet the scrambled phrase NP2 is interpreted to be focused due to its syntactic configuration. The intermediate phrasing in (25.2) reflects the fact that the scrambled phrase NP2 is focused via F-structure; and it is focused by its syntactic configuration as well. The intermediate phrasing in (25.3) reflects the fact that NP1 is focused via F-structure; and the scrambled phrase NP2 is focused due to its syntactic configuration. Likewise, the intermediate phrase in (25.4) reflects the fact that V is focused via F-structure; and the scrambled phrase NP2 is focused due to its syntactic configuration.

The focus interpretations and the intermediate phrasing patterns in (21) can be explained in the same fashion. The intermediate phrasing in (21.1) reflects the fact that there is no F(\) assigned to any of the phrases; yet the scrambled phrased is
syntactically interpreted to be focused. The intermediate phrasing in (21.2) reflects the F-structure \([y \ F(x)] \ [y \ \cdots \ y \ \cdots \ ];\) and the scrambled phrase is interpreted both prosodically via F-structure and syntactically via adjunction structure.

There are three pieces of evidence to support the view that syntactic focus marking is independent of F-structural focus marking. Note, first, the difference in the degree of emphasis between the scrambled phrase with F-assignment in (21.2) and the one without in (21.1). That the former is more prominent than the latter in the degree of emphasis supports the view that the focus interpretations associated with scrambled structures should not be via F-structure.

Second, scrambled phrases are focused; yet their intermediate phrasing patterns violate the FOCUS-LEFT-EDGE constraint at their left edges. The following are schematic F-structure representations of the sentence in (21) with its object noun phrase being scrambled to a position preceding the dative postpositional phrase:

26 Object scrambling

1) 
\[
\begin{align*}
&s \ \text{NP1} \ \text{NP2} \\
&i \ \text{NP1} \ \text{NP2} \\
&i \ \text{PP} \ \text{V} \\
&i \ \text{PP} \ \text{V} \\
\end{align*}
\]
NP2 is focused syntactically

2) 
\[
\begin{align*}
&s \ \text{F(NP1)} \ \text{NP2} \\
&i \ \text{NP1} \ \text{NP2} \\
&i \ \text{PP} \ \text{V} \\
&i \ \text{PP} \ \text{V} \\
\end{align*}
\]
NP1 is focused prosodically; NP2 is focused syntactically

3) 
\[
\begin{align*}
&s \ \text{NP1} \ \text{F(NP2)} \\
&i \ \text{NP1} \ \text{NP2} \\
&i \ \text{PP} \ \text{V} \\
&i \ \text{PP} \ \text{V} \\
\end{align*}
\]
NP2 is focused prosodically and syntactically
4) \[ [s \ NP1 \ [vP \ NP2] \ [vP \ F(P) \ \psi \ V \ ]] ]\]
[\[i \ NP1 \ ] \ [i \ NP2 \ ] \ [i \ PP \ V \ ] \]

PP is focused prosodically; NP2 is focused syntactically.

5) \[ [s \ NP1 \ [vP \ NP2] \ [vP \ PP \ \psi \ F(V) \ ]] ]\]
[\[i \ NP1 \ ] \ [i \ NP2 \ ] \ [i \ PP \ ] \ [i \ V \ ] \]

V is focused prosodically; NP2 is focused syntactically.

The intermediate phrasing in (26.1) reflects the fact there is no \( F() \) assigned to any of the phrases; and the scrambled object phrase NP2 is focused syntactically. Similarly, the sentences in (26.3) through (26.5) derive their intermediate phrasing patterns via F-structure, and their focus interpretations derive from their F-structures and the syntactic configuration of the scrambled object NP2.

Peculiar is the sentence in (26.2) in that although the scrambled object NP2 is focused syntactically, it is not preceded by an intermediate phrase break. If the focus interpretations associated with scrambled structures were due to F-structure, there would be no reason why the \textit{FOCUS-LEFT-EDGE} constraint should be violated at the left edge of NP2 in (26.2). (As will be discussed in the next chapter, \textit{FOCUS-LEFT-EDGE} is a highest ranked constraint, which no well-formed phrasing can violate.) The only reason we can attribute to the failure of the \textit{FOCUS-LEFT-EDGE} constraint at the left edges of scrambled phrases seems to be that the focus interpretations associated with scrambled phrases are made via syntactic structure, and not via F-structure.

The final argument for the view that syntactic focus marking is independent of F-structural focus marking has to do with the multiple focus interpretation within the same intermediate phrase. That multiple focus interpretations within the same intermediate phrase are possible can be shown by the focus interpretations for the
subject and the object NP's within the same intermediate phrase in (26.2). Note that
the focus interpretations in (26.2) shows that the scrambled object NP2 should not be
focused, if the focus interpretations associated with scrambled structures were due to
F-structure, since there is no possibility of multiple focus interpretations via F-
structure within the same intermediate phrase. That multiple focus interpretations
within the same intermediate phrase are possible only with scrambled phrases argues
for the contention that the focus interpretations associated with scrambled structures
should not be via F-structure.

To summarize, three arguments were presented in this section to support the
view that syntactic focus marking is independent of F-structural focus marking. If this
view is valid, then we expect to see these two focus marking systems not pay respect
to each other's highest principles that cannot be violated by any means, or they
overlap (and not override) each other under certain circumstances. Of the three
arguments, the second argument was that scrambled phrases are focused in (26.2); yet
they violate the FOCUS-LEFT-EDGE constraint, which no well-formed phrasing can
violate (as will be discussed in the next chapter). This shows that syntactic focus
marking is insensitive not only to the FOCUS-LEFT-EDGE constraint, but to any phrasing
constraints related to F-structure. This can be explained only if we assume that
syntactic focus marking does not derive its focus interpretation via F-structure.

The other two arguments I presented have to do with the overlapping effects
of the two focus marking systems. One such overlapping effect we saw was the fact
that the degree of emphasis in the scrambled phrase with F-assignment in (21.2) is
more prominent than in the scrambled phrase without F-assignment in (21.1). Another
was the case of multiple focus interpretations within the same intermediate phrase.
Examples included the multiple focus interpretations in (26.2), in which the subject
and the object NP's derive their focus interpretations via F-structure and scrambling, respectively. These two overlapping effects are possible only if syntactic focus marking via scrambling is independent of F-structural focus marking.

In the next chapter I discuss various constraints on well-formed intermediate phrasing and their overriding relationships with one another, within the framework of Optimality Theory. Two of the constraints I will discuss in the next chapter are the two focus constraints I discussed in this chapter: the FOCUS-LEFT-EDGE and FOCUS-TO-END constraints. No example in the next chapter involves scrambling, so that the correctness of my analysis regarding syntactic focus marking in this chapter should not affect the correctness of the analysis in the next chapter. Also noted is the fact that A-focus marking and the other auxiliary processes associated with focus marking are all local to the intermediate phrase, in the sense that they do not affect intermediate phrasing patterns. Therefore, the correctness of my analysis regarding these auxiliary processes in this chapter should not affect my analysis in the next chapter, either.
Chapter III

An optimality-theoretic account of intermediate phrasing

The last chapter discussed the semantics and functions of focus, and its realization mechanisms at the syntactic and prosodic levels. Also discussed were the two focus constraints, which together with the XP-left-edge and the other constraints to be discussed in this chapter, are to circumscribe all and only well-formed intermediate phrasing patterns in a principled manner. The main concern of this chapter is to explicate the principles by which these constraints circumscribe only well-formed phrasing patterns.

The theoretical framework within which the analysis in this chapter is formalized is the Optimality Theory of Prince and Smolensky (1992) and McCarthy and Prince (1992). The main advantage of this framework is its capability of uniformly formalizing the overriding relationships among various constraints, without having to code such overriding relationships into individual constraints.

This chapter is organized as follows. Section III.1 lays out the constraints (including the focus constraints) necessary to account for various phrasing patterns. Section III.2 characterizes the manner in which these constraints apply to intermediate phrasing within the framework of Optimality Theory.

III.1 The constraints on well-formed intermediate phrasing

The order of discussion of the constraints in this section is from higher- to lower-ranked constraints, in the sense defined in Optimality Theory. In the next section, I show how these constraints account for a variety of intermediate phrasing cases in
Japanese. Although some of the constraints were discussed in the last chapter, they are repeated in this section for reference.

Before proceeding to the discussion of intermediate phrasing constraints, I make two general remarks concerning the way the constraints in this section are formulated. First, the phrasing patterns specified by some constraints for particular syntactic and focus structures are not exactly the surface phrasing patterns for these structures. Rather, their surface phrasing patterns are the results of the interaction between them and the other constraints. In this sense, the constraints discussed in this section are not construction-specific.

The advantage of formulating the constraints the way they are is that they can be formulated in the most general manner; such formulations can yield a distinction between maximizing and minimizing constraints. For example, **FOCUS-LEFT-EDGE** is a maximizing constraint, in the sense that it splits a sentence into intermediate phrases at the left edges of foci as maximally as required by the constraint. **FOCUS-TO-END** is a minimizing constraint, in the sense that it merges intermediate phrases to minimize the number of intermediate phrases. Formulating the constraints the way they are in this section allows us to typologically relate seemingly unrelated constraints along the maximizing and minimizing parameter.

My second remark has to do with boundary matching. The constraints in this section (except for **STR-TCLAYERING**) are formulated as left edge alignment requirements. It does not mean, however, that a phrasing pattern which satisfies the left edge requirement of every constraint is permissible, if it misses some matching right boundaries. To rule out these mismatched cases, I assume that boundary matching for every prosodic category is inviolable. (Note that boundary matching is
not the same as exhaustive parsing since the latter is necessary even when boundaries are matching.)

1. **Strict-layering**

The first on the hierarchy of the constraints is the constraint known as Strict Layer Hypothesis (Selkirk 1984). The following is a version of this hypothesis adopt from Hayes (1989):

1. **Strict-layering:** Universal Grammar (Selkirk 1984, Hayes 1989)

   The categories of the Prosodic Hierarchy may be ranked in a sequence C1, C2, \ldots, Cn, such that

   1) all segmental material is directly dominated by the category Cn, and
   2) for all categories Ci, i ≠ n, Ci directly dominates all and only constituents of the category Ci+1.

Any phrasing that violates the **strict-layering** constraint is ill-formed, irrespective of the violation status of any other constraints.

2. **The focus constraints**

The two focus constraints discussed in the last chapter are necessary to account for the intermediate phrasing patterns for sentences with various F-structures. The following are the definitions of these constraints (repeated from the last chapter):
1) **FOCUS-LEFT-EDGE** (Pierrehumbert and Beckman 1988)

Left edge of focus = left intermediate phrase edge

2) **FOCUS-TO-END**

No intervening \([i]\) between every focus and the end of sentence

The following are schematic phrasing representations for sentences with single and multiple foci:

3 Single focus

```
. . . . . focus . . . . . . . \([f]\)
[\([ij]\) \([i]\) No \([i]\) intervenes between \([ij]\) and the sentence-final \([i]\)
```

4 Multiple foci

```
. . . focus1 . . . . . focus2 . . . . . . \([f]\)
[\([l1]\) \([l2][i]\) No \([i]\) intervenes between \([l2]\) and \([i]\)
```

These schematic phrasing patterns should be interpreted as follows. The phrasing patterns for sentences with single and multiple foci are exactly as specified by the XP-left-edge constraint except at the left edges of focus constituents, and between the rightmost focus and the end of the sentence. At the left edges of focus constituents, focus phrasing requires that there be an intermediate phrase break; and there be no intermediate phrase break between the rightmost focus and the end of the sentence.

The presence of phrasing breaks at the left edges of focus constituents in these schematic phrasing patterns is specified by the **FOCUS-LEFT-EDGE** constraint as formulated in (2). The absence of phrasal breaks between the rightmost focus and the
end of the sentence is specified by the FOCUS-TO-END constraint. However, for any focus preceding the rightmost focus, the FOCUS-TO-END constraint as formulated in (2) is always violated, since it requires that there be no intermediate phrase break between any focus constituent and the end of the sentence. As discussed in the last chapter, the FOCUS-TO-END constraint will remain as formulated in (2), and an optimality-theoretic account for the violation of this constraint will be presented in Section III.2.

3. The NONBRANCING-V, XP-LEFT-EDGE and V-LEFT-EDGE constraints

The third constraint has to do with the branchingness of the verb of a sentence. The relevance of branchingness to phrasing is discussed in Bickmore (1990), regarding branchingness of a complement, and its relevance to phonological phrasing. In Japanese, it is the branchingness of a verb that is relevant to intermediate phrasing. The branchingness of a verb is defined here in terms of accentual phrases, the category immediately subordinate to the intermediate phrase. Stated as a definition, a verb is branching if and only if it consists of a single accentual phrase. (See the chapter on accentual phrasing.)

Selkirk and Tateishi (1988, 1991) do not specifically discuss cases of branching verbs. Their XP-left-edge constraint (if assumed to be insensitive to the branchingness of a verb) predicts the following patterns for sentences whose intransitive and transitive verbs consist of a single accentual phrase or or more than one accentual phrase (represented by unlabeled brackets):
The phrasing patterns marked with ‘XP’ are those predicted by the XP-left-edge constraint. The verbs in (5.1) and (5.2) are intransitive verbs; and the latter verb is branching. The verbs in (5.3) and (5.4) are transitive verbs; and the latter verb is branching. The XP-left-edge constraint (incorrectly) predicts a uniform phrasing pattern across sentences involving intransitive verbs, and another across sentences involving transitive verbs. Specifically, the XP-left-edge constraint fails to account for the phrasing for the nonbranching intransitive verb in (5.1) and the branching transitive verb in (5.4).

These cases can be accounted for by prohibiting intermediate phrase formation for nonbranching verbs; and by aligning left intermediate phrase boundaries with the
left edge of a verb (\textit{V-LEFT-EDGE}) and left XP edges (\textit{XP-LEFT-EDGE}). The question is whether these two modifications should be made by directly writing them into the \textit{XP-left-edge} constraint. I submit that they should not be, for the following reason. There is a difference between the requirement for alignment with the left edge of a verb and the prohibition against intermediate phrasing for nonbranching verbs. The difference is that the former does not conflict with (but rather augments) the \textit{XP-left-edge} constraint, whereas the latter conflicts with the \textit{XP-left-edge} constraint at the left edge of a verb phrase, when the verb is intransitive and nonbranching. This conflict is such that the intermediate phrasing for a sentence when the verb is intransitive and nonbranching is exactly as prescribed by the \textit{XP-left-edge} constraint, except at the left edge of the verb or verb phrase, where the prohibition against intermediate phrasing for nonbranching verbs overrides the \textit{XP-left-edge} requirement, and there should not any intermediate phrase break.

A similar overriding effect can be observed when focus phrasing conflicts with the requirements of the \textit{XP-left-edge} constraint. A single focus sentence, for example, results in an intermediate phrasing pattern exactly as prescribed by the \textit{XP-left-edge} constraint, except between the focus and the end of the sentence, where the \textit{FOCUS-TO-END} requirement prevails over \textit{XP-left-edge} requirements, and there should not be any intermediate phrase break.

The overriding relationships with the \textit{XP-left-edge} constraint for these two cases show that they should be construed as characteristics of the relationships between constraints, and not characteristics of individual constraints. Therefore, such cases argue against incorporating nonbranching-V phrasing prohibition into the \textit{XP-left-edge} constraint.
The following are the formal statements for these three constraints to account for the phrasing facts in (5). Exactly how these constraints can account for (5) will be explicated in the next section.

6 NONBRANCHING-VERB

Alignment of a left intermediate phrase with the left edge of a verb is disallowed if it results in an intermediate phrase consisting of a single accentual phrase:

* \[
\begin{array}{c}
\[v \\
\mid \\
[i_a]
\end{array}
\]

7 XP-LEFT-EDGE (Selkirk and Tateishi 1988, 1991)

Left edge of every maximal projection = left intermediate phrase edge

\[
\begin{array}{c}
\ldots \ldots \ldots x_p \ldots \ldots \\
\mid \\
[i]
\end{array}
\]

8 VERB-LEFT-EDGE

Left edge of every verb = left intermediate phrase edge

\[
\begin{array}{c}
\ldots \ldots \ldots [v] \ldots \ldots \\
\mid \\
[i]
\end{array}
\]

The NONBRANCHING-V constraint disallows any intermediate phrase whose sole constituent is a verb consisting of a single accentual phrase. The XP-LEFT-EDGE constraint requires left intermediate phrase boundaries at left maximal projection edges. And the V-LEFT-EDGE constraint requires a left intermediate phrase boundary at the left edge of the verb.
The NONBRANCHING-V constraint overrides the XP-LEFT-EDGE and V-LEFT-EDGE constraints. Witness the phrasing in (5.1), in which no intermediate phrase boundary is allowed at the left edge of a verb phrase, when the verb is intransitive and nonbranching, and its left edge coincides with the left edge of the verb phrase. In the phrasing in (5.3), no intermediate phrase boundary is allowed at the left edge of the transitive verb.

Excursus: Alternative (but incorrect) formulations of the NONBRANCHING-V constraint

Of the six constraints posited in the previous section, the NONBRANCHING-V constraint in (6) may be the most controversial as to its formulation in general, and its specification of the V category in particular. Therefore, in this excursus, I present two alternative formulations of the constraint, and show their incorrectness, before proceeding to the next, final constraint, the MINIMALITY constraint. It must be emphasized at the outset, however, that the fact that the formulation of the NONBRANCHING-V constraint in (6) refers to syntactic information such as the lexical category V should not be a motivation for seeking reformulation of this constraint, for the following reason.

The constraints (including the NONBRANCHING-V constraint) posited in this chapter are mapping constraints that govern the relation between the syntactic S-/Focus-structure and its phonological representation. Unlike phonological rules and constraints that dictate the relation between phonological representations, mapping rules and constraints necessarily refer to the syntactic and focus information present in S-/F-structure (Selkirk 1984). Witness that excluding the STRICT-LAYERING and MINIMALITY constraints, the other constraints necessarily refer to syntactic and focus
information: the focus constraints refer to F-structure, and the XP-LEFT-EDGE and V-LEFT-EDGE constraints refer to the phrasal category XP and the lexical category V in S-structure. Since the NONBRANCHING-V constraint is a mapping constraint, there is no reason to believe that it cannot refer to the lexical category V. Nonetheless I present two alternative formulations of the NONBRANCHING-V constraint to support the formulation in (6) and its reference to the lexical category V.

The NONBRANCHING-V constraint in (6) prohibits any intermediate phrase whose sole constituent is a verb consisting of a single accentual phrase. The first alternative to this formulation is to define the constraint so as to prohibit an utterance-final intermediate phrase consisting of a single accentual phrase as follows:

9 Alternative formulation of the NONBRANCHING-V constraint

\[ \star ([a \hspace{1cm}]_i)_u \]

This formulation correctly describes the phrasing patterns in (5) since the intermediate phrase associated with the verb is utterance final. When the intermediate phrase associated with a verb is not utterance final, however, only the formulation in (6) (but not the formulation in (9)) predicts correct phrasing alignment. Observe the following phrasing patterns for sentences with verbs consisting of two accentual phrases (represented by unlabeled brackets):

10 With a verb consisting of two accentual phrases:

1) \[ [np[ N ] [ p ]_i]_i \]
   \[ \hspace{1cm} [v[ ]_i]_i \] \hspace{1cm} \text{Neutral in focus}
The sentences in (10) end with a verb consisting of two accentual phrases. The bracketing { } indicates that the word is focused.

The crucial case is the phrasing contrast in (10.2), in which the rightmost word is focused. The phrasing break at the left edge of this focused word is due to the FOCUS-LEFT-EDGE constraint. The NONBRANCHING-V constraint given in (6) rules out the incorrect phrasing (since the intermediate phrase aligned with the left edge of the verb consists of a single accentual phrase), whereas the formulation in (9) cannot, for the following reason. That the rightmost intermediate phrase in the incorrect phrasing in (10.2) consists of a single accentual phrase cannot be the reason why this phrasing is incorrect. If it were, the correct phrasing in (10.2) would have to be ruled out as well, incorrectly. If the rightmost intermediate phrase cannot be the basis for ruling out this incorrect phrasing pattern, then nothing else would.

Another alternative to the NONBRANCHING-V constraint define in (6) is to formulate it so as to prohibit any intermediate phrase consisting of a single accentual phrase, as follows:
Alternative formulation of the NONBRANCHING-V constraint

\* [ [i] ]

This formulation correctly rules out the incorrect phrasing in \(10.2\) as follows. The rightmost intermediate phrase in the incorrect phrasing in \(10.2\) violates the branching constraint formulated in \(11\), but its presence is licensed by the FOCUS-LEFT-EDGE constraint. However, the penultimate intermediate phrase violates the branching constraint, and no constraint licenses its presence; hence, the phrasing is ungrammatical.

Although the formulation in \(11\) correctly rules out the incorrect phrasing patterns in \(10\), it also rules out the correct phrasing patterns for adverbial phrases consisting of a bare adverbial:

Incorrect phrasing due to application of the branching constraint in \(11\) to an adverbial phrase consisting of a bare adverbial

\* ................. [avp [ adverb ] ] .................
              ................. [i] .................

Adverbial phrases are not the only phrases whose intermediate phrasing patterns the branching constraint in \(11\) cannot predict correctly. Nominals used as nominal predicates also result in incorrect phrasing patterns by application of the branching constraint in \(11\):

\[np[ kyōo ] \[ wa ] \]np[ nichiyōobi ]

"Today (is) Sunday." Neutral in focus
1) Correct phrasing contrast
\[
\begin{array}{c|c}
\llbracket i \rrbracket_i & \llbracket i \rrbracket_i \\
\star & i \\
i_i & i_i
\end{array}
\]

2) Incorrect contrast by application of the branching constraint (11)
\[
\begin{array}{c|c}
\llbracket i \rrbracket_i & \llbracket i \rrbracket_i \\
\star & i_i \\
i_i & i_i
\end{array}
\]

The focus constraints are irrelevant in (13), since there is no focus involved. The nonbranching-V and V-left-edge constraints are irrelevant either, since there is no verb. The only relevant constraint is the XP-left-edge constraint; and it predicts the phrasing contrast in (13.1) correctly. In contrast, application of the branching constraint in (11) indiscriminately prohibits any intermediate phrase consisting of a single phonological word, and results in the incorrect phrasing contrast in (13.2).

The inadequacies of these two formulations of the nonbranching-V constraint support the formulation in (6), and its reference to the lexical category V. As discussed at the beginning of this excursus, there are constraints that govern the relation between S-/F-structure and its phonological representation. These constraints necessarily refer to the syntactic and focus information present in S-/F-structure. The nonbranching-V constraint is one of these (mapping) constraints.

The other kind is a class of rules and constraints that derive and circumscribe well-formed phonological representations, and well-formed relations between phonological representations. The strict-layering is one such constraint, and circumscribes well-formed layering relations between any two prosodic categories. As such the strict-layering constraint is not of the same kind as the focus and other mapping constraints, which must have access to certain syntactic and focus
information. The final constraint to be discussed in next section is the **MINIMALITY** constraint. This constraint is of the same kind as the **STRICT-LAYERING** constraint, in that it discriminates better from worse intermediate phrasing patterns with reference to the phrasing patterns themselves, and not in reference to S-/F-structure.

4. **MINIMALITY**

The last constraint on the hierarchy is called **MINIMALITY**, which discriminates better from worse intermediate phrasing patterns in terms of the number of intermediate phrases per utterance. This constraint is designed to rule out ill-formed phrasing patterns due to boundary alignment at extraneous places. Observe the following two phrasing patterns:

<table>
<thead>
<tr>
<th>14</th>
<th>[ np_{Mari}^{\text{text}} ]</th>
<th>[ np_{Aoyama-no}^{\text{阿野の}} ]</th>
<th>an\text{-yome-ni} ]</th>
<th>[\text{-ni itta} ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>\text{Mari-subject}</td>
<td>\text{Aoyama-of sister-in-law}</td>
<td>meet-to went</td>
<td></td>
<td></td>
</tr>
<tr>
<td>\text{Marí went to see her Aoyama's sister-in-law.'}</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There is no violation of any existing constraint in the correct and incorrect phrasing patterns in (14). **STRICT-LAYERING** is not violated. The focus constraints are not relevant here since there is no focus involved. **NONBRANCHING-V** is not relevant since the verb is long. **XP-LEFT-EDGE** and **V-LEFT-EDGE** are not violated since the left edges of the XP's and the V are aligned with left intermediate phrase boundaries.

In general, the existing constraints cannot distinguish correct from incorrect phrasing patterns in the following case: a phrasing pattern that is exactly like the correct phrasing pattern, except that it has extraneous boundaries at where there
would be no violation of any existing constraint. For instance, the incorrect phrasing pattern in (14) is exactly like the correct phrasing pattern, except that it has an extraneous boundary *without violating any existing constraint*.

To prevent cases like (14), Selkirk and Tateishi (1991) propose a Minimality Factor that requires that the correspondence between left XP edges and left intermediate phrase edges be bijectional. Translated into the framework of Optimality Theory, Selkirk and Tateishi’s Minimality Factor can be stated as follows:

15 **MINIMALITY**

Every occurrence of a left intermediate phrase boundary is a violation.

If everything else fails, the MINIMALITY constraint counts the number of left intermediate phrase boundaries as violations. The phrasing pattern which has more boundaries than necessary will be ruled out, because it has more MINIMALITY violations.

The most important aspect of any constraint system is that they stand in hierarchical relationships with one another. It is not just the existence of these constraints, that account for well-formed intermediate phrasing patterns; it is their hierarchical relationships, that ensure the correct circumscription of all and only possible intermediate phrasing patterns. An advantage of this way of accounting for a range of phrasing facts is that it provides a formal mechanism to uniformly express the overriding relationships among various constraints, which would have to be coded into individual constraints otherwise, with no relation to each other.
III.2 Optimality Theory and constraints on well-formed intermediate phrasing

In the last section, a range of phrasing facts were introduced, and to account for these phrasing facts, various constraints were formulated. The way these constraints apply was implicit in the way they were formulated. For example, focus phrasing overrides the normal phrasing requirements specified by the XP-LEFT-EDGE and V-LEFT-EDGE constraints, and this overriding relationship was not specifically coded into the formulations of these constraints. The formulations of these constraints, then, are not compatible with the view that defines phrasing patterns to be well-formed iff they do not violate any constraint. Rather, these constraints were formulated so that well-formed phrasing patterns can be defined by how they are violated. In this section, I make explicit this view of constraint application, and support it.

This section begins with the discussion on the typologies of constraints and constraint relationships. These typologies will form the basis of the account that will follow. I will first characterize and classify various inter-constraint relationships; then the characterization and classification of the constraints themselves will follow.

There are two kinds of relationships that exist between any two constraints. One kind of relationships can be characterized as overriding, when the requirements of one constraint override those of another, at places where the former are at variance with the latter. The examples given earlier were cases in which the phrasing requirements of the NONBRANCHING-V and FOCUS-TO-END constraints override those of the XP-LEFT-EDGE constraint, at places where the former conflict with the latter.

The NONBRANCHING-V and FOCUS-TO-END constraints override not only the XP-LEFT-EDGE constraint, but also the V-LEFT-EDGE constraint as well. Examples include the phrasing patterns in (5.1) and (5.3), in which the NONBRANCHING-V constraint...
overrides the V-LEFT-EDGE constraint, in such a way that no intermediate phrase break is possible at the left edge of a verb when the verb is nonbranching. The example given earlier to show the overriding relationship between the FOCUS-TO-END and XP-LEFT-EDGE constraints can serve as an example to show that the FOCUS-TO-END constraint overrides the V-LEFT-EDGE requirement.

An overriding relationship is a relationship in which the requirements of one constraint are satisfied at the expense of another. Another kind of relationships can be characterized as overlapping, when the phrasing requirements of two constraints can be satisfied at the same time in the same context. For example, the phrasing requirements of the XP-LEFT-EDGE and V-LEFT-EDGE constraints can be satisfied at the left edge of a verb phrase and at the left edge of the verb, when the verb is intransitive.

The relationship between the FOCUS-TO-END and NONBRANCHING-V constraints is also overlapping, since there exists a phrasing pattern that satisfies these two constraints at the same time in the same context. The phrasing [Mari-ga Naoko-ni au] 'Mari will see Naoko,' for example, satisfies the FOCUS-TO-END constraint, since the intermediate phrase that contains the focused subject Mari is the rightmost intermediate phrase; and it satisfies the NONBRANCHING-V constraint, since there is no intermediate phrase whose sole constituent is a verb consisting of a single accentual phrase.

The constraints themselves can be classified into two categories: maximizing and minimizing constraints. The constraints that are maximizing are the FOCUS-LEFT-EDGE, XP-LEFT-EDGE and V-LEFT-EDGE constraints; and the constraints that are minimizing are the FOCUS-TO-END, NONBRANCHING-V and MINIMALITY constraints.

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The sense in which maximizing constraints are maximizing is that they split a sentence into a larger number of intermediate phrases. For example, the XP-LEFT-EDGE constraint splits a sentence into intermediate phrases at the left edges of XP’s as maximally as required by the constraint. Minimizing constraints are minimizing in the sense that they merge intermediate phrases to minimize the number of intermediate phrases. The phrasing patterns that satisfy the FOCUS-TO-END constraint, for example, have a less number of intermediate phrases than they would have if the constraint did not apply. The MINIMALITY constraint is the ultimate minimizer, in the sense that the phrasing pattern that best satisfies it has only one intermediate phrase.

The maximizing-minimizing distinction can be related to the overriding-overlapping distinction, as follows. The relationships between maximizing and minimizing constraints are always overriding, in the sense that a maximizing constraint always overrides the requirements of a minimizing constraint, or vice versa. The relationships between maximizing constraints or between minimizing constraints are always overlapping, in the sense that the requirements of maximizing constraints (and those of minimizing constraints) can be satisfied at the same time in the same context.

With the overriding-overlapping and maximizing-minimizing distinctions, our phrasing constraints can be arranged into a linear order of maximizing and minimizing constraints, \(<\text{maximizer}_1, \text{minimizer}_1, \text{maximizer}_2, \text{minimizer}_2, \ldots>\), or \(<\text{minimizer}_1, \text{maximizer}_1, \text{minimizer}_2, \text{maximizer}_2, \ldots>\). If the relation ‘\(X \gg Y\)’ represents ‘\(X\) overrides \(Y\),’ then the maximizer-minimizer relationships can be expressed as follows:
Maximizer-minimizer relationships

maximizer1 ➞ minimizer1 ➞ maximizer2 ➞ minimizer2 ➞ ... 
or
minimizer1 ➞ maximizer1 ➞ minimizer2 ➞ maximizer2 ➞ ...

These maximizer-minimizer relationships are the basis for the optimality-theoretic account that follows.

The essence of Optimality Theory developed by Prince and Smolensky (1992) and McCarthy and Prince (1992) is summarized as follows. Given a set of ranked constraints, an analysis for a given structure A is judged to be better than another structure B, when the highest-ranked constraint violated by B is higher than that violated by A (regardless of the number of violations made by these two analyses). If the highest constraints violated by two analyses are at the same rank, the analysis with a lower second highest violation constraint is selected.

Suppose that the focus constraints are ranked higher than the XP-LEFT-EDGE and V-LEFT-EDGE constraints. Suppose further that of two phrasing patterns, the highest-ranked constraint violated by one phrasing pattern is the XP-LEFT-EDGE constraint, and the one violated by the other is the focus constraints. Then, the former phrasing pattern is better than the latter, since the highest-ranked constraint violated by the latter is higher than the one violated by the former. This expresses the notion that focus phrasing overrides other constraints, in the sense that the phrasing patterns that respect focus phrasing, but violate the XP-LEFT-EDGE constraint are well-formed, whereas the ones that violate the focus constraints, but satisfy the XP-LEFT-EDGE constraint are not.
Given the optimality framework, the characterization of overriding relationships discussed in the last section can be translated as ranking relationships between constraints, expressed in the form of a hierarchy:

17 Constraint hierarchy

\[
\text{STRICT-LAYERING} \\
\text{FOCUS-LEFT-EDGE} = [i \ f \ \ldots \ \ldots \ ] \\
\]

\[
\Rightarrow \quad \text{FOCUS-TO-END} = \{f \ \ldots \ \ldots \ ] \\
\text{NONBRANCHING-V} = * \ [v] \ \ll \\
\]

\[
\Rightarrow \quad \text{XP-LEFT-EDGE} = [\langle X \ldots \ldots ] \text{XP} \\
\text{V-LEFT-EDGE} = [\langle \{ V \ldots \ldots ] \text{V} \]
\]

\[
\Rightarrow \quad \text{MINIMALITY}
\]

The relation ‘\( X \Rightarrow Y \)’ means that the constraint X is ranked higher than the constraint Y. This ranking relation is the same as the overriding relationship in the maximizer-minimizer hierarchy in (16). With the maximizing-minimizing distinction, the hierarchy in (17) can be restated as consisting of lasagna-like layers of maximizers and minimizers.
Constraint hierarchy: Maximizers and Minimizers

Maximizers:  
\[ \text{STRICT-LAYERING} \]
\[ \text{FOCUS-LEFT-EDGE} = [i f \ldots \ldots \cdot] \]

\[ \Rightarrow \]
Minimizers:  
\[ \text{FOCUS-TO-END} = f \ldots \ldots \cdot \]
\[ \text{NONBRANCHING-V} = \ast [v \ldots \ldots \cdot] \]

\[ \Rightarrow \]
Maximizers:  
\[ \text{XP-LEFT-EDGE} = [\pi \ldots \ldots \cdot] \]
\[ \text{V-LEFT-EDGE} = [\pi \ldots \ldots \cdot] \]

\[ \Rightarrow \]
Minimizers:  
\[ \text{MINIMALITY} \]

Overriding relationships expressed as ranking relations in the hierarchy in (18) can be understood in two ways. First, the requirements of a higher-ranked constraint override those of a lower-ranked constraint. Second, the effect of a lower-ranked constraint is visible only when there is no violation of higher-ranked constraints. Specifically, reading from the right end of the hierarchy, the effect of the MINIMALITY constraint is visible only when there is no violation of the constraints higher than itself; the effects of the XP-LEFT-EDGE and V-LEFT-EDGE constraint are visible only when there is no violation of the constraints higher than themselves; and so forth.

There are two advantages in this optimality-theoretic account. First, it allows a maximally general formulation of each constraint, in marked contrast with an analysis in which overriding relationships are directly coded into their relevant constraints. In an optimality-theoretic analysis, the XP-LEFT-EDGE constraint, for example, can be defined in a maximally general fashion without taking account of focus phrasing. Second, the optimality framework allows expression of overriding relationships between constraints under a uniform formalism. In this analysis, the overriding relationship between the FOCUS-TO-END and XP-LEFT-EDGE constraints can be
expressed under the same formalism as the relationship between the NONBRANCHING-V and XP-LEFT-EDGE constraints can be.

The rest of this chapter presents supporting evidence for each ranking relationship (except the ones relating to the STRICT-LAYERING constraint) in (18), and, then shows that the analysis based on the hierarchy in (18) can account for the phrasing patterns associated with a range of syntactic and focus structures. Since overriding relationships are possible only between maximizing and minimizing constraints, the ranking relations to be justified are restricted to the following cases:

19 Ranking relations to be justified

Minimizer ➞ Maximizer

1) NONBRANCHING-V = * [v[ ]] ➞ V-LEFT-EDGE = [iV
2) NONBRANCHING-V = * [v[ ]] ➞ XP-LEFT-EDGE = [iXP
3) FOCUS-TO-END = f· · · · · · ] ➞ V-LEFT-EDGE = [iV
4) FOCUS-TO-END = f· · · · · · ] ➞ XP-LEFT-EDGE = [iXP

Maximizer ➞ Minimizer

5) FOCUS-LEFT-EDGE = [i f· · · · · · ] ➞ NONBRANCHING-V = * [v[ ]]
6) FOCUS-LEFT-EDGE = [i f· · · · · · ] ➞ FOCUS-TO-END = f· · · · · · ]
7) V-LEFT-EDGE = [iV ➞ MINIMALITY
8) XP-LEFT-EDGE = [iXP ➞ MINIMALITY
9) FOCUS-LEFT-EDGE = [i f· · · · · · ] ➞ MINIMALITY
In the section that follows, I will give pairs of phrasing patterns that justifies each ranking relation between a maximizer and a minimizer.

### III.3 Justification of ranking relations

In this section, the nine cases of ranking relations will be justified in the order given in (19). The arguments for some of the ranking relations are direct; and those of others are indirect, in the sense that these ranking relations can be justified if some other ranking relations are assumed to be true. The basic ranking relations which can be justified directly are those of minimizing constraints over maximizing ones. The ranking relations of maximizing constraints over minimizing constraints can be justified if the ranking relations of minimizing over maximizing constraints are true.

The first ranking relation to justify is NONBRANCHING-V $\gg$ V-LEFT-EDGE in (19.1). Observe the following phrasing contrast:

<table>
<thead>
<tr>
<th>Phrasing</th>
<th>F-L</th>
<th>F-E</th>
<th>!V</th>
<th>XP</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) $i_i$</td>
<td>.</td>
<td>.</td>
<td>/</td>
<td>/</td>
<td>*</td>
</tr>
<tr>
<td>2) $i_i$</td>
<td>.</td>
<td>.</td>
<td>*</td>
<td>/</td>
<td>/</td>
</tr>
</tbody>
</table>

The syntactic structure to verify the ranking relation in (20) is the type [subject object short-V]. Phrasing 1 is the correct phrasing pattern, and Phrasing 2 is an incorrect phrasing pattern (indicated by an asterisk preceding the phrasing pattern) for this syntactic structure. Each phrasing is evaluated with respect to each constraint. The '/' marking indicates that the phrasing does not violate the constraint; the '*' marking...
indicates that the phrasing violates it; and the ‘.’ marking indicates that the constraint is not relevant for this particular syntactic and focus structure. The strict-layering constraint is not listed here (and will not be, hereafter), since none of the candidates examined violates it. The minimality constraint is not listed here either, since the number of violations of this constraint is exactly the number of intermediate phrases for each phrasing pattern.

In the first phrasing pattern in (20), Nonbranching-V is not violated, since although the verb is nonbranching (or short), it does not form an independent intermediate phrase. XP-left-edge is not violated since there is a left intermediate phrase boundary at the left edge of every XP. V-left-edge is violated since there is no left intermediate phrase boundary at the left edge of the verb.

In the second phrasing pattern in (20), the two focus constraints are irrelevant since there is no focus involved. Nonbranching-V is violated, since the verb is nonbranching (or short), and it is the sole constituent of the rightmost intermediate phrase. XP-left-edge and V-left-edge are not violated, since left intermediate phrase boundaries are aligned with the left edges of the XP’s and the verb.

The only difference between the two phrasing patterns in (20) is that the first violates V-left-edge, whereas the second violates Nonbranching-V. The Nonbranching-V constraint should be ranked higher than the V-left-edge constraint, to rule out the incorrect phrasing, Phrasing 2, on the basis of the theory that the highest-ranked constraint violated by an incorrect phrasing pattern should be higher than that violated by the correct phrasing pattern.

The second ranking relation Nonbranching-V >> XP-left-edge can be justified as follows. Observe the following phrasing contrast:
The focus constraints are not relevant for this structure, since there is no focus involved. The NONBRANCHING-V constraint is not violated by the first phrasing, but it is by the second phrasing since there exists an intermediate phrase whose sole constituent is a nonbranching/short verb. The XP-LEFT-EDGE and V-LEFT-EDGE constraints are violated by the first phrasing, since no intermediate phrase boundary is aligned with the left edge of the verb phrase, which is the left edge of the verb as well. The NONBRANCHING-V constraint should be ranked higher than both the XP-LEFT-EDGE and V-LEFT-EDGE constraints, to rule out Phrasing 2 on the basis of the theory that the highest-ranked constraint violated by an incorrect phrasing pattern should be higher than that violated by the correct phrasing. If either XP-LEFT-EDGE or V-LEFT-EDGE were ranked higher than XP-LEFT-EDGE, then the highest-ranked constraint violated by the incorrect phrasing would not be higher than that violated by the correct phrasing. Therefore, the NONBRANCHING-V constraint should be ranked higher than both the XP-LEFT-EDGE and V-LEFT-EDGE constraints. It follows, then, that the NONBRANCHING-V constraint should be ranked higher than the XP-LEFT-EDGE constraint. Note that if there were no verb phrase in Japanese, there would be no XP-LEFT-EDGE violation in (21); hence, the ranking relation NONBRANCHING-V >> XP-LEFT-EDGE could not be proved.
The third ranking relation is **FOCUS-TO-END >> V-LEFT-EDGE**. Observe the following phrasing contrast:

\[
22 \quad \text{F-END} \gg \text{V}
\]

**subject** _object_ long-V

\[
\begin{array}{llllll}
\text{[np Mári-ga]} & \text{[pp Náoko-ni]} & \text{[v áu-rashii]} & \text{‘It seems that Mari will see Náoko.’}
\end{array}
\]

1) \[
\begin{array}{llllll}
[i] & [i] & [i] & / & / & *
\end{array}
\]

* 2) \[
\begin{array}{llllll}
[i] & [i] & [i] & / & * & / & / & *
\end{array}
\]

The **FOCUS-LEFT-EDGE** constraint is not violated by either phrasing pattern, since the left edge of the focus subject *Mári* is aligned with a left intermediate phrase boundary in either phrasing pattern. The **FOCUS-TO-END** constraint is not violated by the first phrasing, since the intermediate phrase that contains the focus is the rightmost intermediate phrase; but it is violated by the second phrasing, since the intermediate phrase that contains the focus is not the rightmost. The **NONBRANCHING-V** constraint is not relevant for this structure, since the verb is branching/long. The **XP-LEFT-EDGE** constraint is not violated by either phrasing. The **V-LEFT-EDGE** constraint is violated by the first phrasing, since the left edge of the verb is not aligned with a left intermediate phrase boundary. It must be the case, then, that the **FOCUS-TO-END** constraint is ranked higher than the **V-LEFT-EDGE** constraint for the same reason why the **NONBRANCHING-V** constraint should be ranked higher than the **V-LEFT-EDGE** constraint in (20).

The fourth ranking relation is **FOCUS-TO-END >> XP-LEFT-EDGE**. Observe the following phrasing contrast:
There is no violation of the FOCUS-LEFT-EDGE constraint by either phrasing. The FOCUS-TO-END constraint is violated by the second phrasing, since the intermediate phrase that contains the focused subject *Mari* is not the rightmost. The NONBRANCHING-V constraint is irrelevant for this structure, where the verb is branching/long. The XP-LEFT-EDGE and V-LEFT-EDGE constraints are violated by the first phrasing, in which no intermediate phrase boundary is aligned with either the left edge of the PP or the left edge of the verb. The argument for the ranking relation FOCUS-TO-END >> XP-LEFT-EDGE parallels the argument for the ranking relation NONBRANCHING-V >> XP-LEFT-EDGE in (21): to rule out the incorrect phrasing, the FOCUS-TO-END constraint must be ranked higher than both the XP-LEFT-EDGE and V-LEFT-EDGE constraints.

These four cases constitute the direct argument cases. The next two ranking relations must be justified on the basis of these four core cases. The fifth ranking relation is FOCUS-LEFT-EDGE >> NONBRANCHING-V. This relation can be justified by implication: if NONBRANCHING-V >> V-LEFT-EDGE, then FOCUS-LEFT-EDGE >> NONBRANCHING-V. The relevant evidence is the following phrasing contrast:

<table>
<thead>
<tr>
<th>Case</th>
<th>Phrase Structure</th>
<th>Focus Left-End</th>
<th>Nonbranching</th>
<th>XP Left-End</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>np Mari-ga</td>
<td>/</td>
<td>/</td>
<td>*</td>
</tr>
<tr>
<td>2)</td>
<td>Mari-ga</td>
<td>/</td>
<td>*</td>
<td>/</td>
</tr>
</tbody>
</table>

Note: The table above shows the phrasing structure and the alignment of constraints.
The \textsc{focus-left-edge} constraint is violated by the second phrasing, since no intermediate phrase boundary is aligned with the left edge of the focused verb \textsc{au}. The \textsc{focus-to-end} constraint is not violated by either phrasing, since the intermediate phrase that contains the focus is the rightmost. The \textsc{nonbranching-v} constraint is violated by the first phrasing, since there is an intermediate phrase whose sole constituent is a nonbranching/short verb. The \textsc{xp-left-edge} constraint not violated by either phrasing. The \textsc{v-left-edge} constraint is violated by the second phrasing, since no intermediate phrase boundary is aligned with the left edge of the verb. These violation patterns show that to rule out the incorrect phrasing, the \textsc{focus-left-edge} constraint must be ranked higher than the \textsc{nonbranching-v} constraint, if the latter is higher than the \textsc{v-left-edge} constraint. Since we know that the \textsc{nonbranching-v} constraint is higher than the \textsc{v-left-edge} constraint by the phrasing patterns in (20), the \textsc{focus-left-edge} constraint must be higher than the \textsc{nonbranching-v} constraint.

A similar implicational argument can be made regarding the following phrasing contrast:
25. **NONBRANCHING-V >> XP, V --> F-LEFT >> NONBRANCHING-V**

subject object short-V

\[
\begin{array}{cccccc}
\text{np} & \text{Mári-ga} & \text{llp} & \text{Náoko-ni} & \text{llv} & \text{au} \\
F-L & / & F-E & / & !V & / \\
1) & [i] & [i] & [i] & / & / \\
* 2) & [i] & [i] & [i] & */ & *
\end{array}
\]

'Mari will see Naoko.'

Since we know that **NONBRANCHING-V >> XP-LEFT-EDGE** and **V-LEFT-EDGE** from the phrasing patterns in (21), the **FOCUS-LEFT-EDGE** constraint should be higher than the **NONBRANCHING-V** constraint.

The sixth ranking relation is **FOCUS-LEFT-EDGE >> FOCUS-TO-END**. Observe the following phrasing contrast:

26. **F-END >> V --> F-LEFT >> F-END**

subject object long-V

\[
\begin{array}{cccccc}
\text{np} & \text{Mári-ga} & \text{llp} & \text{Náoko-ni} & \text{llv} & \text{au-rashii} \\
F-L & / & F-E & / & !V & / \\
1) & [i] & [i] & [i] & / & * \\
* 2) & [i] & [i] & [i] & */ & *
\end{array}
\]

'It seems that Mari will see Naoko.'

This is a case of double foci. The **FOCUS-LEFT-EDGE** constraint is violated by the second phrasing, since no intermediate phrase boundary is aligned with the left edge of the focused verb \textit{au-rashii}. The **FOCUS-TO-END** constraint is violated by the first phrasing: the intermediate phrase that contains the focused verb is the rightmost; but the intermediate phrase that contains the focused noun \textit{Náoko} is not the rightmost. The same constraint is not violated by the second phrasing, since the intermediate phrase that contains either focus is the rightmost. The **NONBRANCHING-V** constraint is irrelevant here since the verb is branching/long. The **XP-LEFT-EDGE** constraint is not violated by either phrasing. The **V-LEFT-EDGE** constraint is violated by the second...
phrasing. Since we know that FOCUS-TO-END » V-LEFT-EDGE from the phrasing patterns in (22), the FOCUS-LEFT-EDGE constraint must be higher than the FOCUS-TO-END constraint.

A similar implicational argument can be made regarding the following phrasing contrast:

27 \[ \text{F-END} \gg \text{XP, V} \Rightarrow \text{F-LEFT} \gg \text{F-END} \]

<table>
<thead>
<tr>
<th>Subject</th>
<th>Object</th>
<th>Long-V</th>
</tr>
</thead>
<tbody>
<tr>
<td>np Mário-ga</td>
<td>[pp Náoko-ni ]</td>
<td>[\text{au-rashii} ]</td>
</tr>
</tbody>
</table>

| 1) | \[i \] | \[i \] | \[i \] | * | * | / | / |
| 2) | \[i \] | \[i \] | \[i \] | * | / | * | * |

Since we know that FOCUS-TO-END » XP-LEFT-EDGE and V-LEFT-EDGE from the phrasing patterns in (23), the FOCUS-LEFT-EDGE constraint must be higher than the FOCUS-TO-END constraint.

The seventh ranking relation is V-LEFT-EDGE » MINIMALITY. Observe the following phrasing contrast:

28 \[ \text{V} \gg \text{MINIMALITY} \]

<table>
<thead>
<tr>
<th>Subject</th>
<th>Object</th>
<th>Long-V</th>
</tr>
</thead>
<tbody>
<tr>
<td>np Mário-ga</td>
<td>[pp Náoko-ni ]</td>
<td>[\text{au-rashii} ]</td>
</tr>
</tbody>
</table>

| 1) | \[i \] | \[i \] | \[i \] | * | * | / | / |
| 2) | \[i \] | \[i \] | \[i \] | * | / | * | * |

The focus constraints and the NONBRANCHING-V constraint are irrelevant for this structure, since there is no focus involved, and the verb is branching/long. Only the V.
The LEFT-EDGE constraint is violated by the second phrasing, since no intermediate phrase boundary is aligned with the left edge of the verb. Since there are three intermediate phrases in the first phrasing, and two in the second phrasing, the first, correct phrasing is worse with respect to the MINIMALITY constraint. If the MINIMALITY constraint were higher than the V-LEFT-EDGE constraint, then the correct phrasing pattern would be worse than the incorrect phrasing pattern, incorrectly. Therefore, the V-LEFT-EDGE constraint should be higher than the MINIMALITY constraint.

The eighth ranking relation is XP-LEFT-EDGE \(\gg\) MINIMALITY. Observe the following phrasing patterns:

29 \[
\begin{array}{l}
\text{XP} \gg \text{MINIMALITY} \\
\text{subject object long-V} \\
[I_p \text{Mari-ga }] [I_p \text{Naoko-ni}] [I_v \text{au-rashii}] \text{ 'It seems that Mari will see Naoko.'} \\
1) [i] [i] [i] \cdot \cdot \cdot / / \\
* 2) [i] [i] [i] \cdot \cdot \cdot * / \\
\end{array}
\]

This case is exactly like the phrasing contrast in (28), except that it is the XP-LEFT-EDGE constraint that is violated by the second phrasing. Therefore, the XP-LEFT-EDGE constraint must be higher than the MINIMALITY constraint.

The ninth and final ranking relation is FOCUS-LEFT-EDGE \(\gg\) MINIMALITY. Observe the following phrasing contrast:
This structure involves a complex noun phrase. We know that $\text{FOCUS-LEFT-EDGE} \gg \text{XP-LEFT-EDGE}$ and $\text{V-LEFT-EDGE}$ from all the preceding phrasing contrasts and implications. Therefore, the $\text{FOCUS-LEFT-EDGE}$ constraint must be higher than the $\text{MINIMALITY}$ constraint, since the correct phrasing pattern is worse than the incorrect phrasing pattern in (30) with respect to the $\text{MINIMALITY}$ constraint.

Overriding relationships expressed as ranking relations in the hierarchy in (18) has the following implications. First, the requirements of a higher-ranked constraint overrides those of a lower-ranked constraint. Second, the effect of a lower-ranked constraint is visible only when there is no violation of higher-ranked constraints. Third, for each nonhighest-ranked constraint, there is at least one correct phrasing pattern that violates it, as follows.

For a nonhighest constraint to be proved to be nonhighest, there must be a contrast between the well-formed phrasing pattern that violates this nonhighest constraint, and the ill-formed phrasing pattern that violates a higher constraint. Hence, for each nonhighest constraint, there must be at least one well-formed phrasing pattern that violates it. And this prediction proves to be true. The well-formed phrasing patterns in (26) and (27) violate the $\text{FOCUS-TO-END}$ constraint. The well-formed phrasing patterns in (24) and (25) violate the $\text{NONBRANCHING-V}$ constraint. The well-formed phrasing patterns in (21), (23) and (30) violate the $\text{XP-LEFT-EDGE}$ constraint. The well-formed phrasing patterns in (20), (21), (22), (23) and (30) violate...
the V-LEFT-EDGE constraint. And the well-formed phrasing patterns in (24), (25), (26), (27), (28) and (29) are worst with respect to the MINIMALITY constraint.

For highest-ranked constraints, no well-formed phrasing patterns can violate them, since there is no higher constraint that can override such violations. Then, STRICT-LAYERING must be a highest-ranked constraint, since no well-formed phrasing pattern can violate it. Likewise, FOCUS-LEFT-EDGE must be another highest-ranked constraint, since no well-formed phrasing pattern can violate it. Then, these two constraints must be at the same level. Since the FOCUS-LEFT-EDGE constraint is a maximizer, the STRICT-LAYERING constraint must be as well.

In the discussion that follows, the analysis developed in this section will be examined regarding its accountability for a variety of syntactic and focus structures. Although I do not claim that the analysis in this section accounts for every imaginable syntactic and focus structure, I believe in our analysis on the strength of its accountability for the range of syntactic structures presented in this section and the next. A more thorough examination of this analysis against a wider range of syntactic and focus structures needs to be done in future versions of this dissertation.

III.4 Conclusions

The rank-ordered constraints posited in this chapter can circumscribe all and only possible intermediate phrasing patterns in Japanese. If the results reported in this chapter are general, phonological phrasing (like the rest of phonology) can be construed as an optimality, or conflict resolution problem.

The virtue of the analysis presented in terms of Optimality Theory is that it provides a formalism to express various overriding effects (such as the effects of
focus overriding the normal phrasing requirements) in a uniform fashion. Moreover, each constraint can be stated in a maximally general fashion. The FOCUS-TO-END constraint is an example of this sort, in that it is formalized so as to be applicable to any intermediate phrase, and not just the rightmost intermediate phrase, despite the fact that the effect of this constraint is visible on only the rightmost intermediate phrase.

Another, indirect kind of virtue of the analysis presented in this chapter is that it can account for the phrasing facts. This is not a trivial matter, since it is very difficult to imagine a derivational account, which incorporates all the overriding effects of various types written into rules (in a principled manner), and which can actually account for every bit of phrasing facts presented in this chapter.

The best possible derivational account as an alternative to the optimality-theoretic account presented in this chapter would be a disjunctive-ordering account, in which higher priority rules (corresponding to the higher-ranked constraints in the optimality-theoretic) apply first, and disjunctively (to mimic the overriding effects in the optimality-theoretic analysis). However, there is no sense in which the higher-ranked constraints (such as the focus constraints) in are more specific than lower-ranked constraints (such as the XP-LEFT-EDGE constraint), or the higher-lower ranking relationships are feeding orders (Anderson 1974). Therefore, there is no principled way to the ordering of rules in such a derivation account.

Finally, I make a comment regarding the conflict between the top-down phrasing approach represented by Nespor and Vogel (1986), Hayes (1989) among others, and the bottom-up phrasing approach represented by Selkirk (1986), Chen (1987, 1990) among others. The former prohibits certain phrase boundaries within a
higher domain, whereas the latter builds phrase boundaries from the bottom up solely in relation to syntax, with no relation to other prosodic categories. In Japanese, the NONBRANCHING-V constraint is an example of the former, and the XP-LEFT-EDGE and V-LEFT-EDGE constraints are examples of the latter kind. This sort of conflict does not occur in the analysis in this chapter. Rather, the very existence of such conflict (instead of being a problem) is a virtue in an optimality-theoretic account, since without conflicts, there is no reason to opt for an optimality theory.
Chapter IV

More on intermediate phrasing

IV.1 Empirical survey

This chapter applies the principles of constraint application and violation in the last chapter to various syntactic structures to justify the legitimacy of our analysis. Note, however, that the syntactic structures discussed in this section are not the most complex kind that has been discussed in the literature. Nonetheless, I believe this analysis is well justified, given the range of the syntactic structures whose intermediate phrasing patterns it can account for in a principled manner.

Listed on the following pages for reference are four basic syntactic structures and their focus variations to verify the validity of the constraints and their interrelationships in the last chapter. The constraint marked as '!V' in the tables stands for the NONBRANCHING-V constraint. Underlining indicates that the word is focused. The cases of focus on postpositions are not represented in intermediate phrasing patterns. Short and long verbs are ones consisting of a single accentual phrase and more than one accentual phrase, respectively. Explanatory text follows the next page.
1 subject short-V

\[
\begin{array}{ccccccc}
& np & \text{Mari-ga} & [I] y & kûru & [I] & '\text{Mari will come.}' \\
\text{Phrasing 1} & [i] & [i] & [i] & . & . & * & / \\
\text{Phrasing 2} & [i] & [i] & [i] & . & . & / & *
\end{array}
\]

2 subject long-V

\[
\begin{array}{ccccccc}
& np & \text{Mari-ga} & [I] y & kûru-rashii & [I] & '\text{It seems that Mari will come.}' \\
\text{Phrasing 1} & [i] & [i] & [i] & . & . & / & /
\text{Phrasing 2} & [i] & [i] & [i] & . & . & / & *
\end{array}
\]

3 subject object short-V

\[
\begin{array}{ccccccc}
& np & \text{Mari-ga} & [I] pp & \text{Naoko-ni} & [I] y & \text{au} & '\text{Mari will see Naoko.'} \\
\text{Phrasing 1} & [i] & [i] & [i] & [i] & . & . & * & /
\text{Phrasing 2} & [i] & [i] & [i] & [i] & . & . & / & *
\text{Phrasing 3} & [i] & [i] & [i] & [i] & . & . & * & *
\text{Phrasing 4} & [i] & [i] & [i] & [i] & . & . & * & *
\end{array}
\]

4 subject object long-V

\[
\begin{array}{ccccccc}
& np & \text{Mari-ga} & [I] pp & \text{Naoko-ni} & [I] y & \text{au-rashii} & '\text{It seems that Mari will see Naoko.'} \\
\text{Phrasing 2} & [i] & [i] & [i] & [i] & . & . & / & *
\text{Phrasing 4} & [i] & [i] & [i] & [i] & . & . & * & *
\end{array}
\]
<table>
<thead>
<tr>
<th>Subject</th>
<th>Object</th>
<th>Short-V</th>
<th>NP</th>
<th>PP</th>
<th>Vau</th>
<th>'Mari will see Naoko.'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phrasing 1</td>
<td>[Mari-ga]</td>
<td>[Naoko-ni]</td>
<td>[au]</td>
<td></td>
<td>F-LEFT</td>
<td>F-END</td>
</tr>
<tr>
<td>Phrasing 2</td>
<td>[Mari-ga]</td>
<td>[Naoko-ni]</td>
<td>[au]</td>
<td></td>
<td>F-LEFT</td>
<td>F-END</td>
</tr>
<tr>
<td>Phrasing 3</td>
<td>[Mari-ga]</td>
<td>[Naoko-ni]</td>
<td>[au]</td>
<td></td>
<td>F-LEFT</td>
<td>F-END</td>
</tr>
</tbody>
</table>

| Phrasing 4 | [Mari-ga] | [Naoko-ni] | [au] |      | F-LEFT | F-END | !V | XP | V |

<table>
<thead>
<tr>
<th>Subject</th>
<th>Object</th>
<th>Short-V</th>
<th>NP</th>
<th>PP</th>
<th>Vau</th>
<th>'Mari will see Naoko.'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phrasing 1</td>
<td>[Mari-ga]</td>
<td>[Naoko-ni]</td>
<td>[au]</td>
<td></td>
<td>F-LEFT</td>
<td>F-END</td>
</tr>
<tr>
<td>Phrasing 2</td>
<td>[Mari-ga]</td>
<td>[Naoko-ni]</td>
<td>[au]</td>
<td></td>
<td>F-LEFT</td>
<td>F-END</td>
</tr>
<tr>
<td>Phrasing 3</td>
<td>[Mari-ga]</td>
<td>[Naoko-ni]</td>
<td>[au]</td>
<td></td>
<td>F-LEFT</td>
<td>F-END</td>
</tr>
<tr>
<td>Phrasing 4</td>
<td>[Mari-ga]</td>
<td>[Naoko-ni]</td>
<td>[au]</td>
<td></td>
<td>F-LEFT</td>
<td>F-END</td>
</tr>
</tbody>
</table>

<p>| Phrasing 1 | [Mari-ga] | [Naoko-ni] | [au] |      | F-LEFT | F-END | !V | XP | V |
| Phrasing 2 | [Mari-ga] | [Naoko-ni] | [au] |      | F-LEFT | F-END | !V | XP | V |
| Phrasing 3 | [Mari-ga] | [Naoko-ni] | [au] |      | F-LEFT | F-END | !V | XP | V |
| Phrasing 4 | [Mari-ga] | [Naoko-ni] | [au] |      | F-LEFT | F-END | !V | XP | V |</p>
<table>
<thead>
<tr>
<th>Subject</th>
<th>Object</th>
<th>Phrasing 1</th>
<th>Phrasing 2</th>
<th>Phrasing 3</th>
<th>Phrasing 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>object</td>
<td>long-V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[<em>{np} Mári-ga ] [</em>{pp} Náoko-ni ] [_{V} áu-rashii ]</td>
<td>‘It seems that Mari will see Naoko.’</td>
<td>F-LEFT F-END</td>
<td>!V XP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* Phrasing 1</td>
<td>[i ] [i ] [i ]</td>
<td>[i ]</td>
<td>[i ]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* Phrasing 2</td>
<td>[i ] [i ] [i ]</td>
<td>[i ]</td>
<td>[i ]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* Phrasing 3</td>
<td>[i ] [i ] [i ]</td>
<td>[i ]</td>
<td>[i ]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* Phrasing 4</td>
<td>[i ] [i ] [i ]</td>
<td>[i ]</td>
<td>[i ]</td>
</tr>
<tr>
<td>13</td>
<td>subject</td>
<td>object</td>
<td>long-V</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>[<em>{np} Mári-ga ] [</em>{pp} Náoko-ni ] [_{V} áu-rashii ]</td>
<td>‘It seems that Mari will see Naoko.’</td>
<td>F-LEFT F-END</td>
<td>!V XP</td>
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<td>* Phrasing 1</td>
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<td>[<em>{np} Mári-ga ] [</em>{pp} Náoko-ni ] [_{V} áu-rashii ]</td>
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<td>F-LEFT F-END</td>
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<td>* Phrasing 3</td>
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<td>* Phrasing 4</td>
<td>[i ] [i ] [i ]</td>
<td>[i ]</td>
<td>[i ]</td>
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</table>
15 subject short-V

\[
\begin{array}{c}
\text{[}_{np \text{ Mári-ga}} \text{]} [_{vp \text{ kúru}}] \] ‘Mari will come.’ \\
\text{Phrasing 1} [_{i}] [_{i}] / * * / / \\
\text{Phrasing 2} [_{i}] * / / * *
\end{array}
\]

16 subject long-V

\[
\begin{array}{c}
\text{[}_{np \text{ Mári-ga}} \text{]} [_{vp \text{ kúru-rashii}}] \] ‘It seems that Mari will come.’ \\
\text{Phrasing 1} [_{i}] [_{i}] / * * / / \\
\text{Phrasing 2} [_{i}] * / / * *
\end{array}
\]
<table>
<thead>
<tr>
<th>17</th>
<th>subject object</th>
<th>short-V</th>
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<tbody>
<tr>
<td></td>
<td>[np Mári-ga] [pp Náoko-ni] [v áu]</td>
<td>‘Mari will see Naoko.’</td>
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<td>&gt;</td>
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<td><img src="image2.png" alt="Diagram" /></td>
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<tr>
<td>*</td>
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<td><img src="image3.png" alt="Diagram" /></td>
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<th>short-V</th>
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<tr>
<td></td>
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<td>‘Mari will see Naoko.’</td>
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<td>Phrasing 1</td>
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<td>Phrasing 2</td>
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<th>subject object</th>
<th>short-V</th>
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<tbody>
<tr>
<td></td>
<td>[np Mári-ga] [pp Náoko-ni] [v áu]</td>
<td>‘Mari will see Naoko.’</td>
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<td>Phrasing 1</td>
<td><img src="image9.png" alt="Diagram" /></td>
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<td>*</td>
<td>Phrasing 2</td>
<td><img src="image10.png" alt="Diagram" /></td>
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<td>*</td>
<td>Phrasing 3</td>
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<tr>
<td>Subject</td>
<td>Object</td>
<td>Long-V</td>
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<tr>
<td>[np Mári ga]</td>
<td>[pp Náoko ni]</td>
<td>[v áu-rashii]</td>
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'It seems that Mari will see Naoko.'

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<th>Phrasing 1</th>
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<td><img src="image" alt="XP" /></td>
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There are a number of observations to be made for the phrasing patterns in (1) through (22). First, there are no cases of STRICT-LAYERING violations in these phrasing patterns. Second, there is no case in the violation patterns, in which the MINIMALITY constraint is the highest constraint violated by ill-formed phrasing patterns. Recall that the MINIMALITY constraint was formulated so as to rule out cases of (extraneous) overbracketing. The example of overbracketing cited earlier involves an extraneous intermediate phrase boundary at the left edge of a lexical N, which is not an alignment cite for either XP-LEFT-EDGE or V-LEFT-EDGE. The only syntactic edges in the phrasing patterns in (1) through (22), on the other hand, are V- and XP-edges, and these edges are possible alignment sites for any of the constraints. Hence, the phrasing patterns in (1) through (22) do not show cases of the MINIMALITY constraint, whose violation is the sole criterion that distinguish ill-formed from well-formed phrasing patterns.

Third, except for the phrasing patterns marked with '>', the constraints and their optimality-theoretic interrelationships supported in the last section can account for every phrasing pattern in (1) through (22) in such a way that the highest constraint violated by every ill-formed phrasing pattern is higher than that violated by the well-formed phrasing pattern for a given syntactic and focus structure.

The ill-formed phrasing patterns marked with '>', are cases in which the ranks of their highest violation constraints are the same as those for their well-formed counterparts. The basis for ruling out the phrasing patterns marked with '>' is that the number of violations of the highest violation constraint for these cases is greater than that for their well-formed counterparts. The basis for ruling out the phrasing patterns marked with '-' is that the rank of the second-highest violation constraint for these cases is higher than that for their well-formed counterparts.
IV.2 Predictions

Another way to confirm the validity of our analysis is to check on the predictions it makes. All of the predictions here deal only with neutral intermediate phrasing patterns, the patterns which do not involve any focus.

Prediction 1: with respect to the transitivity and complexity of verb

If our constraint-based analysis is valid, it follows that the transitivity of the verb should be an irrelevant parameter. In other words, our analysis predicts that a verb (regardless of its transitivity) and the NP preceding the verb should form a single intermediate phrase if the verb consists of a single accentual phrase, and two intermediate phrases if the verb consists of more than one accentual phrase. The following paradigm is repeated from a previous chapter to illustrate the intermediate phrasing patterns for the sentences of the form, \([_{\text{np}} \text{ intransitive verb]} \) and \([_{\text{vp}} \text{transitive verb]} \):

1) \([_{\text{np}} \text{ Mári ga } \text{ [}_{\text{vp}} \text{ kúru } \text{ ]} \text{ come} \text{ 'Mari is coming.' } \text{ [}_{\text{Mári}} \text{ [ga] [kúru]} \text{ ]}\]

2) \([_{\text{np}} \text{ Mári ga } \text{ [}_{\text{vp}} \text{ kúru rashfi } \text{ ]} \text{ come seem} \text{ 'It seems that Mári is coming.' } \text{ [}_{\text{Mári}} \text{ [ga] [kúru] [rashii]} \text{ ]}\]
In the paradigm, unlabeled brackets represent accentual phrases.

The paradigm in (23) shows that transitivity is an irrelevant parameter to predict the correct phrasing patterns in the paradigm. The relevant parameter here is the branchingness of the verb, and only the branching constraint can circumscribe the correct phrasing patterns in the paradigm. The following paradigm further supports the relevancy of the branching parameter in intermediate phrasing. The paradigm in (24) consists of the same text with progressively complex verb endings:

24

1) [i nichiyōobi] [i Nágoya de] [i Mári ni áu]
   Sunday Nagoya at Mari with meet
   ‘(I will) meet Mari in Nagoya (this coming) Sunday.’

2) [i nichiyōobi] [i Nágoya e] [i Mári ni] [i áini iku]
   Sunday Nagoya to Mari with meet go
   ‘(I will) go to meet Mari to Nagoya (this coming) Sunday.’

3) [i nichiyōobi] [i Nágoya e] [i Mári ni] [i áini itte kuru]
   Sunday Nagoya to Mari with meet go come
   ‘(I will) go (and come back) to meet Mari to Nagoya (this coming) Sunday.’
In this paradigm, accentual phrases are separated by space. Whether the verb consists of a single or more than one accentual phrase determines whether it and its subcategorized postpositional phrase Mari ni ‘with Mari’ form a single or separate intermediate phrases.

Prediction 2: with respect to the complexity of a phrase preceding the verb

Our phrasing constrains predict the syntactic phrases of the form [np]subj [vp]intransitive verb ] and the form [vplp]object ] [transitive verb ]] to be intermediate-phrased as follows (when the verb consists of a single phonological word):

25  [np]subj [vp]intransitive verb ]  ===>  [subject intransitive verb ]
[vp]object ] [transitive verb ]]  ===>  [object transitive verb ]

And the substitution of the subject or object NP with a complex NP of the form

26  [np]vpnlp N1 no ] N2 no ] N3 ga ]  N1 of N2 of N3 subject ‘N3 of N2 of N1’
or
[vp]nlp N1 no ] N2 no ] N3 o ]  N1 of N2 of N3 object ‘N3 of N2 of N1’
should not alter the intermediate phrasing in (25). This predication can be confirmed by the following which involves increasingly complex left-branching object NP's:

27

1) [avp nichiyóobi] [pp Nagoya de] [vlvpp Mári ni] áu
   [i, nichiyóobi] [i, Nagoya de] [i, Mári ni]
   Sunday Nagoya at Mári with meet
   '(I will) meet Mári in Nagoya (this coming) Sunday.'

2) [avp nichiyóobi] [pp Nagoya de] [vlvpp Mári no, aní ni ] áu
   [i, nichiyóobi] [i, Nagoya de] [i, Mári no, aní ni]
   Sunday Nagoya at Mári of brother meet
   '(I will) meet Mári's brother in Nagoya (this coming) Sunday.'

3) [avp nichiyóobi] [pp Nagoya de] [vlvpp Mári no, aní no, ani'yome ni ] áu
   [i, nichiyóobi] [i, Nagoya de] [i, Mári no, aní no, ani'yome ni]
   Sunday Nagoya at Mári of brother of sister-in-law meet
   '(I will) meet Mári's brother's sister-in-law in Nagoya (this coming) Sunday.'

Prediction 3: with respect to embedding

The last prediction is that an embedded verb (regardless of its transitivity) should be intermediate-phrased with the matrix verb, if the matrix verb consists of a single accentual phrase. Specifically, the sentence of the form

28  · · · · · · · · [[ intransitive verb1 ]v, vph]s to ]s [ verb2 ]v

or

· · · · · · · · [ transitive verb1 ]v, vph]s to ]s' [ verb2 ]v
verb1 complementizer verb2 (matrix verb)
'subject verb2 that · · · verb1 · · · '

108
should be intermediate-phrased as follows (when the matrix verb consists of a single phonological word):

29 ........ [ verb1 to verb2 ]

This is so because there must be an left intermediate phrase boundary at the left edge of the verb, unless such phrasing does not violate the NONBRANCHING-V. And this predication can be confirmed by the following:

30

Nóriko wa [s Tákashi ga · · · · · · · ] to omóttá
Noriko tpc Takashi sbj cmp thought
'Noriko thought that Takashi · · · · · · · ' 

31
1) [ np Tákashi ga ] [ vp [ pp Mári ni ] [ v áu ]]
   [ i Tákashi ga ] [ i Mári ni áu ]
   Takashi sbj
   'Takashi (will) meet Mari.'

2) [ np Náoko wa ] [ s [ slp Tákashi ga ] [ vp [ pp Mári ni ] [ v áu ] ] to ] [ v omóttá]
   [ i Náoko wa ] [ i Tákashi ga ] [ i Mári ni [ i áu to omóttá]
   Naoko tpc Takashi sbj
   Mari with meet cmp thought
   'Naoko thought that Takashi would meet Mari.'

3) [ np Náoko wa ] [ slp Tákashi ga ] [ vp [ pp Mári ni ] [ [ ánî iku ] ] to ] [ v omóttá]
   [ i Náoko wa ] [ i Tákashi ga ] [ i Mári ni [ i ánî iku to omóttá]
   Naoko tpc Takashi sbj
  Mari with meet go cmp thought
   'Naoko thought that Takashi would go to meet Mari.'
The last few chapters presented a constraint-based analysis of intermediate phrasing within the framework of Optimality Theory. The major virtue of such an analysis is its accountability for a variety of syntactic and focus structures in a principled manner, as stated at the end of the last chapter. In the next chapter, I discuss the principles and constraints of accentual phrasing in Japanese. A few things about accentual phrasing have already been mentioned in the chapters on focus marking and intermediate phrasing, and will be explicated more fully in the next chapter, to which we turn now.
Chapter V

Accentual phrasing

The last three chapters discussed the prosodic organization of a sentence in terms of intermediate phrases with reference to the syntactic and focus structure and the accentual phrase organization of the sentence. The main concern of this chapter is the accentual phrase organization of a sentence when the sentence is neutral in focus, and when there are focused constituents.

V.1 The traditional view of accentual phrasing

Accent dictionaries such as Kindaichi and Akinaga (1981) not only list the accentual patterns of individual words, but also explicate the accentual patterns and accent rules for words and stems concatenated or affixed with a word, stem, particle or affix.

Consider the concatenation of a stem with a particle, for example. (We can safely suppose that both the stem and the particle are accented, since it is almost always possible to find at least one combination of an accented stem and an accented particle for each accent rule.) If the stem-particle concatenation results in two accents, the stem and the particle must be two separate accentual phrases, since an accentual phrase can have at most one accent. (It is not clear in these accent dictionaries whether these two accentual phrases are part of the same intermediate phrase, or they form two separate intermediate phrases.) If the stem-particle concatenation results in a single or no accent, the stem and the particle together form a single accentual phrase. (It is not clear in these dictionaries whether this single accentual phrase consists of one or two words.)
It is almost always the case that stem-particle or stem-suffix combinations result in a single or no accent, forming single accentual phrases, according to the traditional view expressed in accent dictionaries. In a few cases, however, these accent dictionaries list some stem-particle or stem-suffix combinations as two accentual phrases with two accents. Examples from Kindaichi and Akinaga (1981) include *yómu yóoda* ‘read seem = seems to be reading,’ *oyógu sóoda* ‘swim hearsay = I heard someone swims,’ etc. (These forms are also possible with a single accent: *yómu yooda* and *oyógu sooda*, being single accentual phrases.) I believe that these forms are two accentual phrases with two separate intermediate phrases with a focus on the particle or the suffix. If this focus interpretation is correct, then these few cases with two accents and the regular cases of a single or no accent show that a stem-particle or stem-suffix combination form either two accentual phrases with two separate intermediate phrases when the particle/suffix is focused, or a single accentual phrase when there is no focus involved. In other words, there are no cases of two accentual phrases within a single intermediate phrase for these stem-particle or stem-suffix combinations, according to the traditional view expressed in the accent dictionaries.

This view of accentual phrasing is consistent with the contention that particles and many of the auxiliary suffixes are syntactically independent, but phonologically dependent (at the accentual phrase level): that is, they are clitics.

However, there are contrasting pairs of pitch patterns which the traditional view fails to distinguish. They are cases of noun-particle sequences with and without a focus on the noun:
1 1) ‘Nagoya subject’ Neutral
   Nagoya ga
   \[\text{L H*L L H L}\]

2) ‘Nagoya subject’ Nagoya is focused
   Nagoya ga
   \[\text{L H*L L H L}\]

2 1) ‘Nagoya from Nagoya’ Neutral
   Nagoya ka ra
   \[\text{L H*L L H L}\]

2) ‘Nagoya from Nagoya’ Nagoya is focused
   Nagoya ka ra
   \[\text{L H*L L H L}\]

3 1) ‘Nagoya from Nagoya’ Neutral
   Nagoya yó ri
   \[\text{L H*L L H*L L}\]

2) ‘Nagoya from Nagoya’ Nagoya is focused
   Nagoya yó ri
   \[\text{L H*L L H*L L}\]
According to the traditional view, case markers and postpositions should be accentual-phrased with their preceding nouns. The following phrasing representations reflect the view of these dictionary authors:

4

'Nagoya subject' Neutral, or Nagoya is focused
[[\text{Na} \text{go} \text{ya} \text{ga}]]

L H* L L

5

'Nagoya from = from Nagoya' Neutral, or Nagoya is focused
[[\text{Na} \text{go} \text{ya} \text{ka} \text{ra}]]

L H* L L

6

'Nagoya from = from Nagoya' Neutral, or Nagoya is focused
[[\text{Na} \text{go} \text{ya} \text{yo} \text{ri}]]

L H* L L

These representations do not include any focus phrasing patterns, since these dictionary authors do not express their view concerning focus marking (and its distinction from neutral phrasing patterns). I take the liberty of assuming that they view focus marking as being realized only as a higher pitch level for the pitch accent linked to a focused constituent. Then, the view expressed in (4) through (6) is that the distinction between phrasing patterns with accented and unaccented particles is phonological, and neutralized in (4) through (6); and the distinction between neutral
and focus marking is merely phonetic, and fails to capture the three-way tonal contrast (and not merely pitch level contrast) represented in (1) through (3).

To represent the accented-unaccented and focused-unfocused distinctions in (1) through (3), I propose the following accentual phrase structures for these contrasts:

7
1) 'Nagoya subject' Neutral

\[
\begin{array}{c}
\text{[\text{[\text{[a} \text{N\text{\textacuted{g}}y\text{a} \text{[a} \text{ga \text{]} \text{]} \}} \text{]} \text{]} \text{]} \text{]} \text{]} \\
\text{L} \quad \text{H*L} \quad \text{L} \quad \text{H} \quad \text{L}
\end{array}
\]

2) 'Nagoya subject' Nagoya is focused

\[
\begin{array}{c}
\text{[\text{[\text{[a} \text{N\text{\textacuted{g}}y\text{a} \text{\textacuted{g}}a \text{]} \text{]} \text{]} \text{]} \text{]} \text{]} \text{]} \\
\text{L} \quad \text{H*L} \quad \text{L}
\end{array}
\]

8
1) 'Nagoya from = from Nagoya' Neutral

\[
\begin{array}{c}
\text{[\text{[\text{[a} \text{N\text{\textacuted{g}}y\text{a} \text{[a} \text{ka \text{ra} \text{]} \text{]} \}} \text{]} \text{]} \text{]} \text{]} \text{]} \\
\text{L} \quad \text{H*L} \quad \text{L} \quad \text{H} \quad \text{L}
\end{array}
\]

2) 'Nagoya from = from Nagoya' Nagoya is focused

\[
\begin{array}{c}
\text{[\text{[\text{[a} \text{N\text{\textacuted{g}}y\text{a} \text{\textacuted{g}}a \text{]} \text{]} \text{]} \text{]} \text{]} \text{]} \text{]} \\
\text{L} \quad \text{H*L} \quad \text{L}
\end{array}
\]
These representations claim that the neutral phrasing patterns in (7.1), (8.1) and (9.1) contrast with their focus phrasing counterparts in (7.2), (8.2) and (9.2), respectively; the phrases with an unaccented case marker and with an unaccented postposition in (7) and (8) contrast with the phrases with an accented postposition in (9); and the focus phrasing patterns in (7) through (9) are identical or neutralized.

V.2 Analysis

The accentual phrasing patterns in (7) through (9) shows that accentual phrases are organized in a different way than expected from the traditional grammar. The analysis I propose for accentual phrasing can be summarized as follows.

According to our definition of phonological words (in the next chapter), free morphemes and morphemes lexically specified with a phonological word juncture are phonological words; and every phonological word is an accentual phrase. According to these definitions, case markers and postpositions are independent phonological words, hence accentual phrases. Postpositional phrases of the form [pp noun postposition], for example, must be accentual-phrased as follows, in neutral focus:
When there is a focused constituent, the intermediate phrasing for the sentence must follow a particular phrasing pattern in such a way that a focused constituent must always head an intermediate phrase. *Accentual rephrasing* is a process in which the accentual phrases internal to an intermediate phrase whose leftmost constituent is focused are rephrased into a single accentual phrase as follows:

**Accentual rephrasing**

For a given focused intermediate phrase (in which the focused word is the leftmost), rephrase all the accentual phrases into a single accentual phrase:

1) \[
\{a\} \quad \{a\} \quad \cdots \quad \{a\}
\]

The leftmost word, or the leftmost accentual phrase, is focused.

2) \[
\{a\}
\]

If the phrase in (10) has focus on the head N, the accentual restructuring rule in (11) rephrases it into a single accentual phrase, as follows:

**Focused N**

1) \[
\{pp\} \quad N \quad postposition
\]

2) \[
\{al\} \quad N \quad \{al\} \quad postposition
\]

3) \[
\{al\} \quad N \quad \{al\} \quad postposition
\]

by phonological word formation

by neutral accentual phrasing

by accentual rephrasing
**Advantages**

There are several advantages in the analysis that every phonological word is an accentual phrase over the traditional view expressed in (4) through (6). First, our analysis can account for the congruence between the fact that every phonological word is an accentual phrase, and vice versa, and the fact that phonological words as well as accentual phrases can be associated with at most one accent.

Another advantage is that our accentual phrasing analysis makes explicit the relation between phrasing and focus marking: the accentual phrases within an intermediate phrase are rephrased as a single accentual phrase when the leftmost phonological word is focused contrastively. In contrast, the traditional view cannot make a tonal distinction between neutral and focus intonations.

Finally, we note that our accentual phrasing analysis further supports the definition of phonological words by recessive junctures (discussed in the next chapter), since it is this definition of phonological words that forms the basis of our accentual phrasing analysis.
Chapter VI

Phonological word formation

This section concerns the lowest-level category, the phonological word, and its definition on the basis of a particular type of accent rules that operate across words. The following sections are organized as follows. This section begins with the typology of three (lexical) accent rules that Poser (1984) describes. The particular type of accentuation that is relevant here is one (called recessive rules) that retains the leftmost accent, in exclusion of the other accent, which is exactly the same in its operation as the phrasal rule that operates across word boundaries. The rest of this chapter deal with the characterization of recessive rules.

In the following, it is mostly verb accentuation that I discuss and illustrate, in defining phonological words, for the reason that it is regular. Later, I discuss the accent rules in nouns, and their exceptions. I will not, however, discuss the accentuation of adjectives specifically, since it is exactly like verb accentuation, with very few idiosyncrasies, and these idiosyncrasies pattern after the exceptional cases of the accent rules in nouns.

VI.1 The level of phonological words

Poser (1984) argues for the necessity of the level of phonological words in the following manner. There is an accent rule, applied with a certain class of suffixes, which shifts the main accent to the right. Examples include:

1. \([\text{w yómu }]\) 'read'
The suffix -masu is a member of the class of morphemes, termed dominant suffixes by Poser. The accent of a dominant suffix, such as -masu, surfaces as the main accent within the phonological word, regardless of the accentedness of the stem.

Dominant accentuation applies within phonological words. The phonological word as a domain must exist in order for dominant accentuation to apply in. This can been demonstrated as follows. Consider the complex verb stems yonde-miru ‘read-see = read and see’ and yonde-miru ‘read-see = try reading.’ Poser attributes the difference between the two to the following phrasing difference:

2  [aw yonde ] [aw miru ]  ‘read and see’
  [aw yonde] [w miru ]  ‘read see = try reading’

The former consists of two accentual phrases, whereas the latter consists of a single accentual phrase. The accentual pattern here can be accounted for by assuming a phrasal accent rule by which the leftmost accent becomes the main accent. The following are the derivations for these forms:

3  [aw yonde ] [aw miru ]  ‘read and see’
  ==>  Phrasal accent rule does not apply across accentual phrases

  [aw yonde ] [w miru ]  ‘read see = try reading’
  ==>  Phrasal accent rule applies within accentual phrases
Consider the same two complex forms, but with -masu suffixation. Both dominant and phrasal accent rules applies as follows:

4 \[ \text{[\text{afw yonde }]} \ [\text{afw mf-masu } ] \] ===> \[ \text{[\text{afw yonde }]} \ [\text{afw mi-masu } ] \] 'read and see' Only dominant accentuation applies

5 \[ \text{[\text{a yonde }]} \ [\text{a mi-masu } ] \] ===> \[ \text{[\text{a yonde }]} \ [\text{a mi-masu } ] \] Dominant accentuation within accentual phrases

Suppose that there were no level of phonological words. Then, dominant accentuation would have to apply within accentual phrases, resulting in the following incorrect forms:

5 \[ \text{[\text{a yonde }]} \ [\text{a mi-masu } ] \] ===> \[ \text{[\text{a yonde }]} \ [\text{a mi-masu } ] \] 'try reading' Dominant accentuation within accentual phrases

VI.2 Syntactic terminals ≠ phonological words

Poser's argument shows that there must be the level of phonological words, since there exists an accent rule which must refer to it. The significance of his argument is that it is based on the notion that phonological phrases serve as domains of phonological rules. I will expand this theme in two ways in the following chapters: phonological words and accentual phrases as domains of certain accent rules, and accentual and intermediate phrases as domains of intonation-text alignment rules. In this chapter (starting with the next section), I examine various accent rule types and their domains, and their relationship with phonological words. Before turning to the
examination of various accent rules, I show in the rest of this section that phonological words cannot be identified with syntactic terminal constituents.

Consider the causative suffix -(s)ase. It is a dominant suffix when the verb stem is accented:

6 tabé-ru eat-present
tabé-sasé-ru ==> tabe-sasé-ru (dominant accentuation)
et-causative-present

As argued earlier, the domain of dominant accentuation is the phonological word. Therefore, (6) must be:

7 [tabé-ru] eat-present
[tabé-sasé-ru] ==> [tabe-sasé-ru] (dominant accentuation)
et-causative-present

Saito (1985), however, argues for the syntactic constituency of the causative suffix. Thus, the verb-causative form must consist of two syntactic constituents, the verb and the causative suffix, in Saito’s analysis. His analysis makes use of the binding condition that a pronominal must be free in its governing category. For example, in English, the pronominal in (8) must be free in its governing category:

8 * Johni criticized himi.
    Johni thinks that Mary criticized himi.

Contrast (8) with the parallel sentences in (9) in Japanese:
If the binding condition (that a pronominal must be free in its governing category) is valid, and explains (8) and (9) in the same fashion, the causative suffix -(s)ase must be analyzed as a syntactic constituent as follows:

If Saito’s analysis is valid, verb-causative forms consist of two syntactic terminal elements, the verb and the suffix, whereas they must be single phonological words to account for the accentuation in (6). The mismatch between syntactic terminals and phonological words, however, does not indicate that there is no relationship between them; it is just that the relationship between syntactic terminals and phonological words is not very transparent, and cannot be easily formalized.

In the following section, I will describe Poser’s typology of various accent rules (and affixes associated with these accent rules), on the basis of which I will define phonological words in section VI.5.


Poser (1984) describe three types of lexical accent rules: recessive, dominant and dependent types (Poser 1984). I will refer to the affixes which induce recessive,
dominant and dependent accent rules as recessive, dominant and dependent affixes, and their junctures as recessive, dominant, and dependent junctures.

**Recessive accentuation**

In recessive accentuation, the accent of a recessive affix manifests itself, just in case the stem is unaccented. If the stem is accented, the accent of the stem becomes the accent of the resulting form. Recessive accent rules (which are lexical, according to Poser and others) exactly parallel the accent rule that operates at the accentual phrase level, in which the leftmost accent becomes the main accent. For example, the accentuation in the suffixation of +rashii ‘-seem’ to the unaccented verb stem *iku* ‘go’ and the accented verb stem *kaéru* ‘return’ illustrates this recessive rule type:

11       iku       go              go+seem
       iku+rashii  go+seem

       kaéru       return
       kaéru+rashii speak+seem

**Dominant accentuation**

In nouns, one form of dominant accentuation can be described by saying that the particle in [noun-dominant particle] forms has its own accent, and the noun-particle form as a whole retains the rightmost accent. In other words, it is the accent of the dominant particle that becomes the accent of the resulting form. For example, the unaccented noun *sakura* ‘cherry’ and the accented noun *énochi* ‘life’ become *sakura-*.
bakari ‘cherry-only’ and inochi-bakari ‘life-only’ when suffixed with the dominant postposition bakari.

There are two other types of dominant accentuation: one is that the accentuation of the resulting form has an accent at a new location, which cannot be predicted by knowing the locations of the accents of the stem and the affix. In N1-N2 compound formation, for example, a new accent of the resulting form is placed either on the final syllable of N1 or the initial syllable of N2, if N2 is unaccented, regardless of the accent pattern of N1. Another type of dominant accentuation, the resulting form is totally unaccented, regardless of the accentuation of the stem and the affix.

The common characteristic among these three types of dominant accentuation in nouns is that the resulting form has a uniform accentual pattern, regardless of the accentedness of its components.

*Dominant accentuation in verbs* has already been illustrated with the formal -másu suffix in the section on the justification of the level of phonological words. The following illustrate this type of accentuation with unaccented and accented verb stems:

12 naku cry
naki-másu cry-formal

yómu read
yomi-másu read-formal

The dominant accentuation manifests itself differently in nouns and verbs. In verbs, the accentuation of the stem-dominant affix form assigns only accentedness to the stem-affix form, since the location of the accent is predictable (as will be
explained next). In the following, I will illustrate the accentual patterns in verbs with simplex verbs, then with verbs with dominant suffixes, to clarify the sense in which the dominant accent rules in verbs assign only accentedness.

**Accentuation of simplex verbs.** The accent of a simplex verb is always on the syllable of the penultimate mora, if the verb is accented. For example, the verb stem *hanas-* ‘speak’ is accented, and the accent on its present form *hanás-u* ‘speak-present’ falls on the syllable of the penultimate mora.

**Accentuation of derived verbs.** The affixation to a verb is either inflectional or derivational, resulting in derived verbs and adjectives (excluding the case of deverbal nouns). For example, the past tense affixation is inflectional; and the -*másu* suffixation is derivational, resulting in a derived (formal) verb. Since the category of inflectional forms of verbs is a verb, the affixation to a verb (excluding the case of deverbal nouns) results in verbs or adjectives. If an affixation is dominant, the resulting verb or adjective (regardless of the accentedness of the stem) becomes accented, and follows the penultimate accent rule of simplex verbs, as if the derived verb or adjective were simplex.

For example, suffixed with the dominant formal suffix -*másu*, the accented verb stem *hanas-* ‘speak’ becomes the derived verb, *hanashi-másu* ‘speak (formally)’ with the accent on the syllable of the penultimate mora, as if the derived verb, *hanashi-másu*, were simplex. The unaccented verb stem *naku-* ‘cry’ suffixed with -*másu* follows the penultimate accent rule, and becomes *naki-másu*, as if the derived verb were simplex. The accentuation in dominant affixation, then, can be analyzed as a result of two rules: one that assigns accentedness to a verb stem, and one that assigns the penultimate accent to a derived or non-derived accented stem.
Dependent accentuation

Dependent accentuation occurs only in verbs. It is exactly like dominant accentuation, except that it respects the accentedness of the stem. Thus, the dependent accentuation in a stem-affix form is simply dominant if the stem is accented, and it is unaccented if the stem is unaccented. The causative suffix -(s)as eru is an example of dependent suffix. For example, suffixed with the causative -(s)as eru, the unaccented verb stem naka- 'cry' becomes the unaccented verb, naka-as eru, whereas the accented stem hana- becomes the accented verb, hana-as éru, and follows the penultimate accent rule.

VI.4 Formalization of Poser's proposal on representation of accentedness

Since the notion of accentedness is crucial in describing the differences among various accent rules, I will give a formalization of accentedness on the basis of Poser (1984). Poser argues for the notion of accentedness independent of the notion of the location of the accent, citing cases including the dependent accentuation in verbs. To formalize the notion of accentedness, Poser suggests the separation of pitch accents from their linking to moras. Thus, the accentedness of accented verbs can be formalized by the presence of a pitch accent not linked to any mora, whereas the unaccentedness of unaccented verbs can be represented by the absence of any pitch accent. A linking rule, then, links the pitch accent of an accented verb to the mora specified by the linking rule. In contrast, accented nouns are represented by the presence of a pitch accent linked to a specific mora (since the location of an accent in nouns is not predictable), whereas unaccented nouns are specified with no pitch accent.
On the basis of Poser’s proposal, I will formally represent the accentuation in verbs and nouns as follows:

13  unaccented stem ‘cry’-present  n a · k · u
    accented stem ‘speak’-present  h a · n a · s - u
                                 H*L
    unaccented noun ‘cherry’      s a · k u · r a
    accented noun ‘woman’         o n · n a
                                 H*L

The accent of an accented verb falls on the syllable of the penultimate mora.

The following illustrate the four cases of accent location:

14  CÝ · CV    ha-ná-s-u    speak-present
    CÝV · CV    tó-s-u    pass-present
    CV · CÝV    ha-na-s-ōo speak-will
    CVV · CÝV    too-s-ōo pass-will

These patterns can be informally described by the following three constraints:

15  Linking constraints

1)  FINAL-MORA: Final mora cannot be linked with a pitch accent.
2)  WEAK-MORA: The weak mora of syllable cannot be linked with a pitch accent.
3)  LINK-ACCENT: Floating pitch accent must be linked as far to right as possible.

Hierarchy

FINAL-MORA
WEAK-MORA ➞ LINK-ACCENT
VI.5 Analysis

VI.5.1 Characterization

Recessive rules are left-end rules (so is the phrasal accent rule), whereas dominant and dependent rules are right-end rules. Such a recessive accent deletion rule would be a left-end rule, and deletes all the pitch accents to the right of the leftmost accent. Dominant rules, in contrast, are right-end rules. In terms of our rules, the right-end character of dominant rules stems from Accent Deletion, which deletes all the pitch accents to the left of the rightmost accent within phonological words.

Dependent rules in verbs have a dual character: they are dependent (meaning that they inherit the accentedness of the stem); and they are right-end rules (they behave like dominant rules when suffixed to accented stems). The examples given earlier were naku ‘cry’ and nak-aseru ‘cry-causative’ with the unaccented stem nak-, and hanásu ‘speak’ and hanas-aseru ‘speak-causative’ with the accented stem hanas-. In these examples, the stem-causative form inherits the accentedness of the stem, and the accent of the stem-causative form with an accented stem seems to shift rightward.

Analyzed in our terms, dependency is not a magical property of dependent suffixes: they are just unaccented suffixes. The stem-causative form with an unaccented stem, for example, is unaccented, since the stem is unaccented, and the causative suffix is unaccented. The stem-causative form with an accented stem is accented because of the unlinked pitch accent of the stem. Dependency is a natural consequence of the unaccentedness of dependent suffixes and the unlinked status of the pitch accent of an accented stem.
The seemingly right-end character of dependent accentuation, in terms of our rules, stems from Linking Rule, which links the rightmost unlinked pitch accent to the penultimate mora of the stem-suffix form.

Besides dependency, recessive rules on the one hand, and dominant and dependent rules on the other, appear to be symmetrical to each other, since the only difference between them seems to be the left/right directionality of rule application: recessive rules are left-end rules, whereas Accent Deletion and Linking Rule in dominant and dependent accentuation are right-end rules. The left/right directionality of these rules appears to be arbitrary.

However, (besides the difference in directionality) there exist other significant differences between recessive rules, and dominant and dependent rules. These differences are not mere directionality differences. In the following, I will describe these differences in turn.

1. Recessive rules have a phrasal counterpart, whereas dominant and dependent rules do not. Recessive rules have a counterpart rule at the accentual phrase level, which deletes all the pitch accents to the right of the leftmost accent within accentual phrases, whereas dominant and dependent rules do not. Why are there two types of left-end rules (which function the same way) at the lexical level and the phrasal level? And why is there no phrasal counterpart to dominant and dependent rules?

2. Regard and disregard of the category of the stem. Recessive accentuation applies the same way regardless of the category of the stem, whereas dominant and dependent accentuation is sensitive to the category of the stem. Recessive rules are not sensitive to the lexical category of the stem. They select the leftmost pitch accent,
regardless of the noun/verb category of the stem. In contrast, dominant and dependent rules are sensitive to the lexical category of the stem as follows. Dominant and dependent rules are right-end rules, and their right-end character stems from Linking Rule (which links the rightmost unlinked pitch accent to the penultimate mora of the verb stem-suffix form) and Accent Deletion (which deletes the pitch accents to the left of the rightmost pitch accent in noun stem-suffix forms). In other words, the source of the right-end nature in dominant and dependent accentuation varies depending on whether the stem is a verb (in which case Linking Rule (and possibly Accent Deletion) applies) or a noun (in which case only Accent Deletion applies).

3. Recessive rules are compositional (so is the phrasal accent rule), whereas dominant and dependent rules are holistic. Recessive rules are compositional (so is the phrasal accent rule), so that the resulting accentuation of a stem-suffix form can be determined solely on the basis of the accentuation of the stem and the suffix: it is either the accent of the stem or the suffix, whichever comes leftmost. In contrast, dominant and dependent rules are holistic. The resulting accentuation cannot be calculated from the accentual pattern of the stem and the suffix alone. Linking Rule in dependent accentuation, for example, does not just select the rightmost pitch accent, but it links it to a specific mora. And the information about which specific mora is linked is not contained in the accentual patterns of the stem and the suffix. In some cases, dominant and dependent rules even introduce a new accent on the stem-suffix form, and the location of this new accent cannot be determined from the accentual patterns of the stem and the suffix alone. In the following, I will describe and analyze a particular type of compound accent rule, which is dominant, and which introduces a new accent.
4. Recessive rules do not allow extrametricality, whereas dominant and dependent rules do. There are many types of verbal (inflectional and derivational) suffixation, in which the suffixes must be extrametrical, if Linking Rule is to derive correct accentual patterns. Observe the following accentual patterns of several unaccented and accented verbs with the present suffix -ru, the gerundive suffix -te, and the past suffix -ta:

<table>
<thead>
<tr>
<th>Case</th>
<th>Verb Form</th>
<th>Accent Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unaccented stem-present</td>
<td>abi-ru</td>
<td>bathe-present</td>
</tr>
<tr>
<td></td>
<td>kari-ru</td>
<td>borrow-present</td>
</tr>
<tr>
<td></td>
<td>mochi-i-ru</td>
<td>use-present</td>
</tr>
<tr>
<td>Accented stem-present</td>
<td>oki-ru</td>
<td>wake-present</td>
</tr>
<tr>
<td></td>
<td>kaké-ru</td>
<td>hang-present</td>
</tr>
<tr>
<td></td>
<td>hiki-f-ru</td>
<td>lead-present</td>
</tr>
<tr>
<td>Unaccented stem-gerundive</td>
<td>abi-te</td>
<td>bathe-gerundive</td>
</tr>
<tr>
<td></td>
<td>kari-te</td>
<td>borrow-gerundive</td>
</tr>
<tr>
<td></td>
<td>mochi-i-te</td>
<td>use-gerundive</td>
</tr>
<tr>
<td>Accented stem-gerundive</td>
<td>óki-te</td>
<td>wake-gerundive</td>
</tr>
<tr>
<td></td>
<td>kâke-te</td>
<td>hang-gerundive</td>
</tr>
<tr>
<td></td>
<td>hikf-i-te</td>
<td>lead-gerundive</td>
</tr>
<tr>
<td>Unaccented stem-past</td>
<td>abi-ta</td>
<td>bathe-past</td>
</tr>
<tr>
<td></td>
<td>kari-ta</td>
<td>borrow-past</td>
</tr>
<tr>
<td></td>
<td>mochi-i-ta</td>
<td>use-past</td>
</tr>
</tbody>
</table>
Accented stem-past

<table>
<thead>
<tr>
<th>Stems</th>
<th>Past Tense</th>
</tr>
</thead>
<tbody>
<tr>
<td>6ki-ta</td>
<td>wake-past</td>
</tr>
<tr>
<td>kāke-ta</td>
<td>hang-past</td>
</tr>
<tr>
<td>hikf-i-ta</td>
<td>lead-past</td>
</tr>
</tbody>
</table>

All three suffixes are dependent. The -te suffixation, for example, is dependent, because the -te form with an unaccented stem is unaccented, whereas the -te form with an accented stem is accented. However, the present forms differ from the gerundive and past forms, as to the location of the main accent: the former have penultimate accents, whereas the latter have antepenultimate accents. Therefore, we conclude that the gerundive and past suffixes, among others, are extrametrical, with respect to the Linking constraints, which assigns penultimate accents to verbs. The following are the representations of -te forms with unaccented and accented stems:

17  abi (te)

\[
\begin{align*}
\text{oki (te)} & \Rightarrow \text{oki (te)} \\
\text{H*L} & \quad \text{H*L}
\end{align*}
\]

The parentheses here represent extrametricality. The verb stem abi- is unaccented. The suffix -te is dependent, and, therefore, is unaccented. The verb stem oki- is accented, and, therefore, is lexically specified with a pitch accent. Then, Linking Rule applies, linking the rightmost pitch accent with the penultimate mora, in exclusion of the extrametrical suffix. Contrast these forms with the following present forms of the same stems:
Although the present suffix -ru is dependent, it is not extrametrical. The only difference between -te and -ru suffixes is that the former is extrametrical, whereas the latter is not.

I cited here only verbal suffixes as examples of extrametricality. There are other cases of extrametricality involved in dominant and dependent rules in other categories, such as nouns. However, I know of no case of extrametricality involved in recessive accent placement rules. The reason for this disparity seems to be that recessive rules are, in fact, are phrasal, whereas the other rules are lexical.

VI.5.2 Explanation of the differences

The differences described in the previous section cannot be explained without modifying the premise that recessive rules are lexical. The first difference was that recessive rules have a counterpart rule at the accentual phrase level, whereas dominant and dependent rules do not. There were two questions raised regarding this difference. The first was why there are two types of left-end rules (which apply identically) at the lexical as well as phrasal levels. If recessive rules are phrasal, however, there is only one type, and not two types, of left-end rules at the accentual phrase level. The second question was why there is no phrasal counterpart to
dominant and dependent rules. If there is only one type of recessive rules, phrasal recessive rules, which do not have any lexical counterpart, then there is no reason to expect a phrasal counterpart to lexical rules such as dominant and dependent rules.

The second difference was that recessive rules are not sensitive to the lexical category of the stem (selecting the leftmost pitch accent, regardless of the syntactic category of the stem), whereas dominant and dependent rules are. This difference stems from the fact that recessive rules apply across phonological words, disregarding the categories of the words, whereas dominant and dependent rules are lexical rules, which are sensitive to the category of the stem.

The third difference was that recessive rules are compositional (so is the phrasal accent rule), whereas dominant and dependent rules are holistic. If recessive rules are left-end phrasal rules, recessive junctures would have to be analyzed as boundaries of phonological words. Then, stem-recessive suffix forms would be represented as two phonological words, [stem] [recessive suffix], over which the left-end phrasal rule applies compositionally. In contrast, dominant and dependent rules are holistic, because they are lexical rules operating within phonological words, and stem-dominant suffix forms (and stem-dependent suffix forms) consist of a single phonological word, [stem-dominant suffix].

The fourth difference was that dominant and dependent rules allow extrametricality, whereas recessive rules do not. The type of extrametricality discussed in the previous section was the extrametricality with respect to Linking Rule in dominant and dependent accentuation. There, Linking Rule links a pitch accent to the penultimate mora in exclusion of the extrametrical material at the right edge. It is the linking of pitch accents to moras, and not the selection of a particular
pitch accent, in dominant and dependent accentuation, that is relevant to extrametricality. Extrametricality is irrelevant to recessive rules, since recessive rules (whose sole function is to select a particular pitch accent) do not have a linking function.

The explanations given in this section for the differences between different types of accent rules argue for the hypothesis that recessive rules are phrasal, and recessive junctures are boundaries of phonological words. Later I will present a more direct case of support for the hypothesis.

VI.5.3 Further argument

The argument in this section shows more directly that recessive rules are phrasal, and stem-recessive suffix forms must consist of two phonological words, [stem] [recessive suffix].

The accentuation in the suffixation of the continuative suffix -tari ‘(verb) and’ is recessive, because of the forms such as abi-tāri ‘bathe and’ with the unaccented stem abi-, and ōki-tari ‘get up and’ with the accented stem ōki-. The suffix -tari is not dependent, since it does not respect the accentedness of the stem. It is not dominant, since the -tari forms do not have a uniform accentual pattern across accented and unaccented stems. Therefore, the suffix -tari must be recessive.

There are two classes of auxiliary suffixes which exhibit the same behavior as the continuative suffix -tari. One is the class of recessive suffixes (including the continuative suffix -tari, and the conditional -tara ‘if’) which disallow any inflectional affixes (such as the past suffix -ta). For example, there cannot be any inflectional affix between a stem and -tari, and the stem-tari form as a whole must be
tenseless, and there is no past form of stem-tari. Another is the class of recessive endings which must have some inflectional affix between the stem and the recessive ending. For example, -toki ‘when’ is recessive, and there must be some inflectional affix between the stem and -toki. Compare the following -tara and -toki forms:

<table>
<thead>
<tr>
<th></th>
<th>abitára</th>
<th>bathe-if</th>
</tr>
</thead>
</table>
*| abiru-tára | bathe-present-if |
*| abita-tára | bathe-past-if |
| okitara | wake-if |
*| okfru-tara | wake-present-if |
*| okita-tara | wake-past-if |
*| abitóki | bathe-when |
| abiru-tóki | bathe-present-when |
| abita-tóki | bathe-past-when |
*| oki-toki | wake-when |
| okfru-toki | wake-present-when |
| okita-toki | wake-past-when |

Note first that there cannot be any inflectional material between the stem and -tara, whereas an inflectional affix can be between the stem and -toki. Second, both endings, -tara and -toki, are recessive, since the accent location for these two endings is revealed only when the stem is unaccented. The difference in accentuation between oki-ru-toki ‘wake-present-when’ and oki-ta-toki ‘wake-past-when’ is due to the fact that the past tense suffix is extrametrical, as explained previously. These can be analyzed as follows:

20 oki-ru
oki-ru + tóki => okíru toki by penultimate accentuation (lexical)
by recessive accentuation (phrasal)
Despite the slight difference between tari-class suffixes and toki-class endings, they are both recessive anyway, and can be used in the argument in this section. However, I will use a tara/-tari-type suffix as an illustration for the following argument. The objective of the following argument using tari-forms is to show that the stem and the recessive suffix are phonological words within an accentual phrase, and the recessive rule that applies here is a rule that applies to words within an accentual phrase.

The suffix -tari is accented because of the form abi-tari ‘bathe and’ with the unaccented stem abi-. Suppose that stem-tari forms are verbs, so that the pitch accent of the suffix is not linked to any mora. Suppose also that stem-tari forms are single phonological words. The following are the initial representations of -tari forms with the unaccented stem abi- and the accented stem oki-. The brackets represent phonological words, within which Linking Rule applies. The following are the initial representations:

\[ \begin{array}{c}
\text{abi} \quad \text{tari} \\
\text{H*L}
\end{array} \]

\[ \begin{array}{c}
\text{oki} \quad \text{tari} \\
\text{H*L} \quad \text{H*L}
\end{array} \]
Suppose we first apply Recessive Accent Deletion, which, I have not formalized yet, deletes all the pitch accents to the right of the leftmost pitch accent within a phonological word:

\[
\begin{array}{c}
\text{abi} \\
\text{tari} \\
\text{H*L}
\end{array}
\]

\[
\begin{array}{c}
\text{oki} \\
\text{tari} \\
\text{H*L}
\end{array}
\]

Then, we apply Linking Rule, which links the rightmost pitch accent to the penultimate mora within a phonological word:

\[
\begin{array}{c}
\text{abi} \\
\text{tari} \\
\text{H*L}
\end{array}
\]

\[
\begin{array}{c}
\text{oki} \\
\text{tari} \\
\text{H*L}
\end{array}
\]

*\[
\begin{array}{c}
\text{oki} \\
\text{tari} \\
\text{H*L}
\end{array}
\]

This results in an incorrect accentuation for the accented stem.

Reversing the order of application between Recessive Accent Deletion and Linking Rule would still result in the following incorrect forms:
We suppose instead that -tari forms consist of two phonological words. The following are the initial representations:

We apply Recessive Accent Deletion first, but there is no change to (22), since Recessive Accent Deletion (which is supposed to be lexical) applies within phonological words. Then, we apply Linking Rule, which applies within phonological words:
This still results in an incorrect accentual pattern for the accented stem. Applying Linking Rule first, then Recessive Accent Deletion, to (22) would still result in an incorrect accentual pattern. The only way to get a correct form is to modify Recessive Accent Deletion, in such a way that it applies across phonological words. Then, this modified Recessive Accent Deletion applied to (22) would give a correct form as follows, whether this modified Recessive Accent Deletion or Linking Rule applies first. The following is the final, correct result after the application of the modified Recessive Accent Deletion and Linking Rule:

\[
\begin{array}{c}
\text{abi} \\
H^L
\end{array}
\begin{array}{c}
\text{tari} \\
H^L
\end{array}
\]

To summarize, stem-tari forms must consist of two phonological words, and Recessive Accent Deletion must apply across phonological words.

I have assumed that stem-tari forms are verbs, so that the pitch accent of the tari-suffix is not actually linked to any mora. Since I lack any factual basis to suppose that the stem-tari forms are verbs, I repeat the preceding argument with the assumption that stem-tari forms are not verbs. Suppose that -tari forms are not verbs,
so that the pitch accent of the \(-tari\) suffix is lexically linked to the initial mora of the \(-tari\) suffix. Also suppose that stem-\(-tari\) forms are single phonological words. The following are the initial representations:

\[
\begin{array}{c|c}
abi & tari \\
| & H^*L \\
\end{array}
\]

\[
\begin{array}{c|c}
oki & tari \\
| & H^*L \\
\end{array}
\]

Starting with this initial representations would result in incorrect forms, unless we further assume that \(abi\), \(oki\) and \(-tari\) are separate phonological words, and Recessive Accent Deletion applies across phonological words. Therefore, whether we assume that stem-\(-tari\) forms are verbs or not does not have any bearing on our conclusion that \(abi\), \(oki\) and \(-tari\) must be separate phonological words, and Recessive Accent Deletion must apply across phonological words.

**VI.6 Idiosyncrasies of the recessive rules in nouns**

This section concerns a class of idiosyncrasies of recessive rules that apply to noun-particle forms. If these idiosyncrasies can be explained away, then a generalization would hold that particles bound to nouns are all phonological words.

The only basis of the argument for the lexical status of recessive rules is the idiosyncratic nature of some recessive rules in nouns. That some recessive rules in nouns have exceptions (despite the fact that the other recessive rules in nouns, and the
recessive rules in verbs, are regular) was the basis of the analysis that recessive rules in general are lexical. However, that there are some recessive rules in nouns that are idiosyncratic does not necessarily mean that the recessive rules in nouns, and recessive rules in general, are lexical. In this section, I will argue for the definition of phonological words in terms of recessive junctures, and isolate and analyze the idiosyncrasies of some of the recessive rules in nouns.

The argument in this section consists of isolating the cases of idiosyncrasies that are idiosyncratic because rules are idiosyncratic, from the cases of idiosyncrasies that are idiosyncratic not because rules are idiosyncratic, but because rules fail to apply under certain idiosyncratic circumstances, including the idiosyncratic accentual patterns of stems. The latter kind of idiosyncrasy is manifest in the accent rules that apply to noun-particle forms. And it is this class of idiosyncrasies that I will be concerned with in this section.

The particles in noun-particle forms are mostly case markers and postpositions. Postpositions must be distinguished from case markers on the basis of the fact that it is only postpositions that can be followed by the topic marker -wa and the copula -desu. Many of the particles undergo recessive accentuation in noun-particle forms, but there are particles that undergo dominant accentuation. The idiosyncratic part is that the class of particles that undergo recessive accentuation does not correspond to either the class of case markers, or the class of postpositions, or any class of particles that are syntactically and semantically well defined. The second kind of idiosyncrasy is that there is one recessive particle -no 'of,' whose rule application is idiosyncratic.
The clue for an explanation for the first kind of idiosyncrasy is that the particles that undergo dominant accentuation also undergo recessive accentuation as a variant, and that there is no particle that undergoes dominant accentuation, but not recessive accentuation. The following illustrates the dual accentual character of the postposition -gurai:

24 Recessive sakura-gurai cherry-only/about
   inochi-gurai life-only/about

25

* Either recessive or dominant accentuation is acceptable.

Another kind of exceptional behavior for these particles is that their accentuation must be recessive when the noun is preceded by a modifying noun:

25 [np watashi-no sakura ] - gurai I-of cherry-only/about
   [np watashi-no inochi ] - gurai I-of life-only/about

The only possible explanation would be that the scope of the postposition -gurai in (25) is a legitimate noun phrase, whereas the scope of the same postposition in (24) is a noun phrase in recessive accentuation, and it is a lexical noun in dominant accentuation. In other words, the noun-gurai forms in (24) should be represented as follows:

26 Recessive [np sakura ] [p gurai ] cherry-only/about
   [np inochi ] [p gurai ] life-only/about
Dominant \[ n \quad \text{sakura} \] - gurai
\[ n \quad \text{inochi} \] - gurai

In the recessive case, the structure is phrasal: namely, it is a postpositional phrase. In the dominant case, the structure is \[ w \quad \text{stem-derivational suffix} \]. The difference between the recessive and dominant forms is that the -gurai in recessive forms is a recessive postposition, whereas the -gurai in dominant forms is a dominant, derivational suffix. Then, a lexical noun followed by the dominant, derivational suffix -gurai undergoes dominant accentuation, whereas a noun phrase followed by the recessive postposition -gurai undergoes recessive accentuation exactly like other postpositions that are not variable in accentuation. However, the meaning differences between sakura-gurai with the postposition -gurai, and sakura-gurai with the derivational suffix -gurai are not very transparent.

This analysis also explains why every particle can undergo recessive accentuation (and some undergo dominant accentuation as well), but there is no particle that undergoes solely dominant accentuation. If recessive accentuation were a lexical rule exactly like dominant accentuation, and if the only difference between the two types of rules were the left/right directionality, then the occurrence of particles that undergo solely dominant accentuation would be expected to be as likely as the occurrence of the particles that undergo solely recessive accentuation.

This analysis not only accounts for the recessive/dominant variation in the accentuation of certain particles, but also provides an explanation to the second kind of idiosyncrasy, the idiosyncratic behavior of the recessive accentuation of -no, to which we will turn in the following section.
The idiosyncrasy of the recessive accentuation of -no

The accentuation in noun-no forms ‘noun-of’ is recessive, except when the noun is finally accented. Observe:

27 sakura-ga cherry-subject
inochi-ga life-subject
otootó-ga younger brother-subject

sakura-no cherry-of
inochi-no life-of
otooto-no younger brother-of

The subject marker -ga is unaccented, and is recessive. Therefore, -ga forms indicate the true accent location of the noun preceding -ga. The -ga forms in (27) show that sakura is unaccented, inochi is initially accented, and otootó is finally accented. The -no forms in (27) show that -no is unaccented, and it is recessive, except for the finally accented noun. Poser analyzes the -no accentuation by positing a pre-No deaccenting rule.

However, when preceded by a modifying noun, the accent of a finally accented noun does not delete:

28 [np watashi-no sakura] - no I-of cherry-of
[np watashi-no inochi] - no I-of life-of
[np watashi-no otootó] - no I-of younger brother-of
* [np watashi-no otooto] - no

The analysis for -gurai forms can explain these forms as well. Then, there are two -no’s: the recessive case marker -no and the dominant, derivational suffix -no. It is the dominant, derivational suffix -no that undergoes final accent deletion in (27),
where the -no in [n otoo] - no is a dominant, adjectival suffix, and this noun-no form undergoes deletion of the final accent of the noun, and becomes [n ooto] - no.

Why, then, is there no variant form, [np otoo] - no, in which -no is a case marker, and there is no final accent deletion? In fact, there is:

29       [np otoo] - no  Tákashi  Takashi, (my) younger brother
*       [np ooto] - no  Tákashi

This is the case of appositive or nonrestrictive -no, where the deletion of the final accent of the noun cannot be allowed. The -no in (29) is a case marker, and the noun-no form undergoes recessive accentuation like any other case markers and postpositions.

Note that, in the case of -no, the meaning differences between the case marker -no and the derivational suffix -no are more transparent than the case of -gurai. For example, [n otoko] - no with otoko ‘man’ may be interpreted as ‘male’, and [n otoo] - no with otoo ‘younger brother’ may be interpreted as ‘siblingly.’ Or, the derivational suffix -no may be a possessive marker. For example, [n otoko] - no with otoko ‘man’ can be interpreted as ‘(the) man’s.’

Certain derivational suffixes are indistinguishable from their recessive counterpart suffixes, solely on the semantic ground, but on accentual patterns, the former differ sharply from the latter, in that only the latter exhibit recessive accentual patterns. And such a difference in accentual patterns can be accounted for only by assuming that derivational suffix forms are single phonological words, whereas their recessive counterparts are two separate phonological words.
VI.7 Conclusions

In this chapter, the hypothesis that recessive suffixes and particles comprise phonological words is advanced and supported. This hypothesis can be further supported in terms of intermediate phrasing as follows. Defining phonological words by recessive junctures can capture the generalization that the smallest units that can be contrasted or focused are phonological words, as we saw in the chapters on intermediate phrasing.

In this chapter, I discussed only those particles bound to nouns. As for the particles bound to verbs and adjectives, most of the particles bound to nouns also occur with verbs and adjectives, except that some of them, including the possessive particle -no ‘of,’ do not occur with verbs and adjectives for various reasons. A generalization concerning particles in general is that the particles that occur with verbs behave the same way as they do with nouns, in that they are all recessive, and some of them have dominant accentuation (in phrasal context) in addition. The argument in this chapter can be extended over to particles in general. Therefore, particles in general are phonological words.

As for auxiliary suffixes, I discussed in this chapter tara-/hari-class and toki-class auxiliary suffixes as representatives of recessive auxiliary suffixes bound to gerundive forms and to nonpast/past forms of verbs and adjectives, respectively. Concerning auxiliary suffixes in general, most of the ones bound to noun stems and to gerundive and nonpast/past forms of verbs and adjectives are recessive, and a few of them are strictly dominant. That not all auxiliary suffixes (bound to noun stems and gerundive and nonpast/past forms of verbs and adjectives) are recessive is not a shortcoming of our analysis, however. Rather, it is an argument for the necessity for
the category, phonological word, independent of syntactic and morphological categories.
References


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