

ACCENT IN THE HIROSAKI DIALECT  
OF JAPANESE

# A Thesis

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D. *ma*, *aff*, *acc*, *dat*, *gen*

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## Preface

The Hirosaki dialect is a dialect which is spoken in Hirosaki City and its suburbs. Hirosaki is the oldest city in Aomori Prefecture (the northmost prefecture in Honshuu), and its population is approximately 150,000. Most of them are farmers or small businessmen. There are no big factories in the city. Several large sake 'rice wine' companies are scattered throughout the city. Hirosaki is known as the apple town. More than 50 percent of the apples in Japan are produced in the Tsugaru Province (Hirosaki is about the center of the province). The Tsugaru clan had governed the Tsugaru Province for 250 years until 1868. During that period, common people were not allowed to communicate with other provinces. Since the Tsugaru clan lived in Hirosaki, Hirosaki was the capital of the Tsugaru Province and the Hirosaki dialect was the official language in the province. They formed their own dialect which was quite different from neighboring provinces, Akita Province and Nanbu Province.

After the Tsugaru period was over in 1868, Hirosaki was supported financially from farms. There has been no rapid mixture of races or industrialization in the city. But now there exist two languages in Hirosaki. The first is the Hirosaki dialect and the second is a

language which is similar to standard Japanese. The people in Hirosaki call the language similar to standard Japanese e kotoba 'a good language'. They use e kotoba when they talk to their superiors or to the people they do not know well and they use their own dialect when they talk to their families, relatives and close friends.

e kotoba and standard Japanese are quite different. Even today e kotoba is not understood by the people outside of the Tsugaru Province. Let me compare the differences among three languages, the Hirosaki dialect, e kotoba and standard Japanese (the Tookyoo dialect). The accent of e kotoba is the same as that of the Hirosaki dialect.

Hirosaki dialect    [dōsa ?iguba]<sup>1</sup> 'Where do you go?'

e kotoba            [dogo?e ?igimasuka]

Standard Japanese [doko?e ?ikimasuka]

Hirosaki dialect    [ko:kogugoto yonderadogosa kisita]

'(He) came just as (I) was reading the ads'

e kotoba            [ko:kogu?o yonderudogoro?e kimasita]

Standard Japanese [kookoku?o yonde?irutokoro?e kimasita]

The purpose of this paper is to represent the underlying accent of a morpheme and to represent the accent of a compound by a rule. I use "compound" not only to mean a compound of nouns, but also a compound of other morphemes. For example, a phrase which consists of a noun plus a particle, a phrase which consists of a verb-stem plus

an auxiliary verb, etc. are compounds. Various boundaries are set from the syntactic point of view. I will omit all boundaries which are not necessary to describe the Hirosaki accent system.

The description of the Hirosaki dialect is mainly on the phonemic level except for the description of the accents. I only describe the phonetic detail if it is necessary to represent an accent or is related to one.

Examples of compound nouns are given in the appendix.

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## 1. Introduction

Accent in the Japanese language is called a pitch accent controlling the 'high-and-low' correlation recognized between moras (in the Hirosaki dialect, such correlation is recognized between syllables). For example, in [ $\bar{?ame}$ ] 'rain', the first mora [ $?a$ ] is pronounced with a **high** pitch in the Tookyoo dialect. There is a "fall of pitch" before [ $me$ ]. In Japanese terms, there is a "taki"<sup>2</sup> between [ $?a$ ] and [ $me$ ], [ $\bar{?ame}$ ]. In [ $?ame$ ] 'candy', [ $me$ ] has a high pitch, and the phrase [ $?amega$ ] 'rain(nominative)' is pronounced with an even, high pitch. There is no "fall of pitch".

According to the place of the "fall of pitch", three accent patterns are recognized. They are named "the initial accented pattern", "the middle accented pattern" and "the final accented pattern".<sup>3</sup> The pattern which has no "fall of pitch" like [ $?ame$ ], [ $?amega$ ], etc., is named "the atonic pattern".<sup>4</sup>

### 1a. The atonic pattern.

In the word [ $hana$ ] 'nose', [ $na$ ] has a higher pitch than [ $ha$ ], as [ $hana$ ]. If we put the particle [ $ga$ ] after the word, we get [ $hanaga$ ]. This is a word of the atonic pattern. In the Tookyoo dialect, the first mora is automatically pronounced with a lower pitch, [ $hanaga$ ], and in the Hirosaki dialect, the last syllable is automatically pronounced with a higher pitch, [ $hanaga$ ]. As "atonic" is

defined as no "pitch-drop" in a phonological phrase, both the Tookyoo and Hirosaki dialects are the same in abstract sense.

I consider that an atonic noun in the Hirosaki dialect has a preaccent in the underlying form, /<sup>ˈ</sup>0...../. /na/ of /hana/ 'nose' does not have an accent in the underlying form, and /na/ becomes automatically high-pitched on the surface form. If I consider /na/ has an accent, \*/hanã/ 'nose' + /ga/ should be \*[hanēga].

When atonic words are followed by other words, the preaccents eliminate other accents, i.e. left dominance:  
 /<sup>ˈ</sup>hana/+/kusūri/ → /<sup>ˈ</sup>hanagusuri/ 'a tip'  
 /<sup>ˈ</sup>hana/+/<sup>ˈ</sup>kami/#/māde/ → /<sup>ˈ</sup>hanagamimade/ 'even a tissue'.  
 [+] is an internal word boundary and [#] is a word boundary. By a pitch assignment rule, the last syllable becomes high-pitched.

[ ] → [high pitch] / %<1acc>.....\_\_ %  
 [%] means a minor phrase boundary.

/<sup>ˈ</sup>hanagusuri/ → [hanagusuri]  
 /<sup>ˈ</sup>hanagamimade/ → [hanagamimade].

But there are exceptions when some particles, auxiliary verbs and nouns follow atonic words. I will discuss the problem later and here I will just give some examples:

/<sup>ˈ</sup>mizu/#/<sup>ˈ</sup>yori/ → /mizūyori/ 'more than water'  
 /<sup>ˈ</sup>tookyoo/+/zyuū/ → /tookyoozyuū/ 'throughout Tokyo'.

The preaccent does not deduct following accents over a minor phrase boundary [%]:

/ʔusi/#/ʔga/%/hasiru/ → /ʔusiga % hasiru/ → [ʔusigā hasiru] 'a cow runs'.

1b. The tonic patterns.

A. The final accented pattern.

In the word /hana/ 'a flower', /na/ has a higher pitch than /ha/ as [hanā], but it is a different pattern from [hanā] 'a nose'. If I put a particle /ʔga/ after the word /hana/ 'a flower', I get [hanāga] and there is a "fall of pitch" before /ga/.<sup>5</sup> I indicate the underlying accent of /hana/ 'a flower' as /hanā/. This is a word of the final accented pattern.

In the Tookyoo dialect, by pronouncing words of the atonic and final accented patterns in isolation, people cannot distinguish them from each other; they do not know whether the following words (1) and (2) are atonic or final accented.

(1) ʔe 'a handle', ʔhana 'a nose'

(2) ʔeʔ 'a picture', hanā 'a flower'.

By putting particles after the words, they distinguish (1) from (2). For example, [ʔegā] 'a handle (nominative)' is atonic and [ʔega] 'a picture (nominative)' has final accent.

In the Hirosaki dialect, (1) and (2) have different pitches even if they are pronounced in isolation. /ʔe/



is pronounced with an even, high pitch, [ $\overline{?e}$ ]. It is an atonic word, and the words in (2) have a "high-to-low" pitch in the last syllable. That is,  $/\overline{?e}/$  is pronounced starting with a high pitch and the pitch falls to a low pitch, [ $\overline{?e}$ ], and in the word  $/\text{hana}\overline{a}/$ , [ha] has a low pitch and [na] is pronounced starting with a high pitch and the pitch falls to a low pitch like [ $\overline{?e}$ ], [ $\text{hana}\overline{a}$ ].<sup>6</sup>  $/\overline{?e}/$  and  $/\text{hana}\overline{a}/$  are final accented words.

#### B. The middle accented pattern.

If a word has a high pitch on a medial syllable, I call it a middle accented word.  $/\text{sen}\overline{a}\text{ka}/$  'a shoulder' and  $/\text{kudam}\overline{o}\text{no}/$  'a fruit' are classified as middle accented words.

In the words with more than four syllables, if the accent is not on the penultimate syllable, the syllables of the words have high pitches from the accented syllables to the penultimate syllable in the Hirosaki dialect,  $\dots\overline{0}\dots00 \rightarrow \dots\overline{0}\dots\overline{00}$ . Since there is no single morphemes with more than four syllables, let me explain it with a compound:

$/\text{wata}\overline{a}/ + / \text{tebukuro}/ \rightarrow / \text{watatebukuro}/ \rightarrow [\text{watatebukuro}]$   
'a cotton glove'.

#### C. The initial accented pattern.

If the initial syllable in a word has an accent, I call it an initial accented word:

$/\text{ha}\overline{r}\text{u}/$  'spring',  $/\text{k}\overline{u}\text{zira}/$  'a whale'.

Like a middle accented word, a pitch extends to the

penultimate syllable in the word or in the phrase with more than three syllables:

/kūzira/ → [kuzira], /kūziraga/#/'ga/ → [kuziraga].

In the Hirosaki dialect, a pitch extends to the penultimate syllable within a boundary which is less than a minor phrase boundary. But as we see later, there are exceptions. Within a word boundary, all pitches extend to the penultimate syllables if a single morpheme or a compound noun is not followed by another morpheme which comes after the word boundary. When some particles and auxiliary verbs follow words, pitches do not extend to the penultimate syllables:

/yama/#/'sika/ → /yamāsika/ → \*/yamāsika/.

This problem will be discussed below.

Many initial accented words with two syllables in the Tookyoo dialect are classified as final accented words in the Hirosaki dialect. The words /ʔame/'rain', /ʔasa/'morning' and /neko/'a cat' are accented on the first syllables in the Tookyoo dialect, but in the Hirosaki dialect, the accents are on the second syllables. The final vowels of these words are /e/, /a/ and /o/. These vowels are produced by opening the jaws wider than for /i/ and /u/, high vowels. The final vowels of the words /hasi/'chopsticks', /ʔaki/'autumn', /haru/'spring' and /yoru/'night' are /i/ and /u/, and the accents of these words are on the first syllables in both Hirosaki and Tookyoo

dialects. When people produce /i/ and /u/, they bring the upper and lower jaws closer together. Thus, according to the size of the opening between jaws in the final vowels, two syllable words which are classified as initial accented words in the Tookyoo dialect, are classified as both initial and final accented words in the Hirosaki dialect:

Tookyoo dialect	Hirosaki dialect	
/ʔāme/	/ʔamē/	'rain'
/ʔāsa/	/ʔasā/	'morning'
/nēko/	/nekō/	'cat'
/ʔāki/	/ʔākī/	'autumn'
/hāru/	/hārū/	'spring'.

The non-initial accented words with two syllables in the Tookyoo dialect are never pronounced with the initial accent in the Hirosaki dialect. The words which have the accents initially in the Tookyoo dialect and finally in the Hirosaki dialect are as follows:

/ʔaka/ 'red', /ʔase/ 'morning', /ʔase/ 'sweet', /ʔame/ 'rain', /ʔeto/ 'traces', /ʔita/ 'board', /ʔito/ 'thread', /ʔoke/ 'pail', /kage/ 'shadow', /kasa/ 'umbrella', /kata/ 'shoulder', /kame/ 'tortoise', /kumo/ 'cloud', /muko/ 'bridegroom', /hune/ 'boat', /naka/ 'middle', /neko/ 'cat', /yane/ 'roof', /tane/ 'seed', etc.

There is an exception. /tuyu/ 'dew' is pronounced with an accent on /tu/ in the Tookyoo dialect, /tūyu/. Although the last vowel of the word is [+high], /yu/ becomes high-pitched in the Hirosaki dialect, /tuyū/.

1c. A mora-counting syllable language (Tookyoo) and a syllable-counting syllable language (Hirosaki).

In the Tookyoo dialect, the first moras<sup>7</sup> of [ $\bar{\text{ban}}$ ] 'a guard' and [ $\bar{\text{saibu}}$ ] 'details' have higher pitches, and [ $\text{ba}\bar{\text{n}}$ ] 'night' and [ $\text{te}\bar{\text{n}}$ ] 'a point' have higher pitches on the second moras. The first two words are tonic and the last two words are atonic. In the Hirosaki dialect, the accent patterns are the same as those of the Tookyoo dialect but a syllable has a high pitch instead of a mora as in the Tookyoo dialect: [ $\bar{\text{banga}}$ ] 'a guard(nominative)', [ $\bar{\text{saibu}}$ ] 'details', [ $\bar{\text{ban}}$ ] 'night', [ $\bar{\text{ten}}$ ] 'a point'.

[ $\bar{\text{ban}}$ ] and [ $\bar{\text{saibu}}$ ] in the Tookyoo dialect have high pitches on the first moras on the surface forms, but there is no word which has a high pitch on the second mora contrasting with them: \* $[\text{ba}\bar{\text{n}}]$  and \* $[\text{sa}\bar{\text{ibu}}]$ . Therefore, we may say that both dialects have an accent on a syllable in the underlying form, and we make a rule as follows:

Tookyoo dialect (a mora-counting syllable language)

$$\begin{array}{c} \text{C} \text{ V} \text{ N}^{\bar{}} \\ \text{C} \text{ V} \text{ V}^{\bar{}} \end{array} \rightarrow \begin{array}{c} \text{C} \text{ V}^{\bar{}} \text{ N} \\ \text{C} \text{ V}^{\bar{}} \text{ V} \end{array}$$

Thus, in the Tookyoo dialect, the first mora has a high pitch on the surface form although the syllable has an accent in the underlying form. On the other hand, in the Hirosaki dialect, a high pitch on the surface form is on the syllable. The Tookyoo dialect is called a "mora-counting syllable language" and the Hirosaki dialect may

be called a "syllable-counting syllable language".

McCawley (1968: 134) defines a "mora-counting syllable language" as follows:

"...(1) there is no contrast between "accented first mora" and "accented second mora" in a long syllable: in a long syllable, only the first mora may be the "accented mora" of the phrase; (2) rules such as the one putting accent three moras from the end of foreign words will put the accent on the fourth mora from the end if the third mora from the end happens to be the second mora of a long syllable; the correct form of the rule thus "place accent on the syllable containing the third from last mora", (3) there are a number of environments in which a final-accented noun is made unaccented; for these rules to operate interpreted as meaning "accented on the last syllable" rather than "accented on the last mora", .... Japanese is thus a mora-counting syllable language."

It is clearly true that the Hirosaki is a "syllable-counting syllable language" when we consider foreign words. Most foreign words have accents on the penultimate syllables in the Hirosaki dialect:

/kyaṇḁee/'candy', /bāsu/'bus', /ʔoren̄zi/'orange', /terēbi/'television', /ʔarukoōru/'alcohol', /ʔigirīsu/'England', /kasutanētto/'castanet', /ʔasuparagāsu/'asparagus', /toran-sureēsyon/'translation', /ʔarisutoterēs̄su/'Aristotle', etc.

## 2. Nouns.

### 2a. The types of accent.

The types of Japanese accent are classified into two major groups, namely the Tookyoo type and the Kyooto-Oosaka type. Besides these, there is the so-called "Single-Series" accent. The Hirosaki accent belongs to the Tookyoo type: both the Tookyoo dialect and the Hirosaki dialect have

$n+1$  accentuations for nouns.  $n$  indicates a syllable or syllables. For example, one syllable nouns have two different accentuations,  $\text{'0}$  and  $\text{0'}$ ; two syllable nouns have three accentuations,  $\text{'00}$ ,  $\text{0'0}$  and  $\text{00'}$ ; three syllable nouns have four different accentuations,  $\text{'000}$ ,  $\text{0'00}$ ,  $\text{00'0}$  and  $\text{000'}$ , etc. For one to three syllable nouns, the accentuations mean the same as accent patterns, and for more than four syllable nouns, we have more than two "middle accented patterns". The number of "middle accented patterns" increases with  $n-2$  formula (this formula does not apply to one syllable nouns). Therefore two syllable nouns have no "middle accented pattern"; three syllable nouns have one "middle accented pattern", etc. Thus, four syllable nouns, for example, have five different accentuations and two different "middle accented patterns", 1  $\text{'0000}$ , 2  $\text{0'000}$ , 3  $\text{00'00}$ , 4  $\text{000'0}$  and 5  $\text{0000'}$ .

2b. Compound nouns.

First of all, I will discuss the accent of compound nouns in the Hirosaki dialect.

Before I represent the rules for compound nouns, I will summarize junctures and explain the symbols which are used to represent rules. I use six different junctural elements and, as McCawley (1968; 55) mentions, they form a hierarchy in the sense that there is an order relationship among them under which any occurrence of a juncture also counts as an occurrence of all "weaker"

junctures.

{ \$ } pause

{ @ } major phrase boundary

{ % } minor phrase boundary

{ # } word boundary

{ + } internal word boundary

{ & } morpheme boundary

The hierarchy means that, for example, any occurrence of { + } also counts as an occurrence of { & }; any occurrence of { # } also counts as an occurrence of { + } and { & }, and so on.

McCawley (1968:56) continues as follows:

"sinse junctures are assumed to occur only at morpheme boundaries, morpheme boundary (within &) will be the lowest member of the junctural hierarchy; the highest member will be pause."

Following McCawley,<sup>8</sup> I use the syllable boundary [σ], because it is convenient to show with a "taki" that an atonic word has a preaccent in the underlying form. S means a "syllable", <1acc> indicates an "accent on the place", <1acc> means "to put another accent on the syllable boundary where the primary accent is already present" and <\_\_\_\_> means "to put an accent on the place". S<1acc> is read, "There is a primary accent on the boundary following the syllable" and <1acc># is read, "There is a primary accent on the boundary following the last syllable of a compound of a word", and #<1acc> is read, "There is a

primary accent on the boundary preceding the first syllable of a compound or a word".

#### A. Native Japanese.

There are four rules which apply to compound nouns of native Japanese. I write with the abbreviation CN for the rules. All rules are in the phonemic level.

CN A  $\sigma \rightarrow \langle 1acc \rangle / \# \langle \overline{1acc} \rangle \dots + (\dots)_{na\#t.n}$

CN B  $\sigma \rightarrow \langle 1acc \rangle / \# \dots + (\dots S \langle \overline{1acc} \rangle S \dots)_{na\#t.n}$

CN C  $\sigma \rightarrow \langle 1acc \rangle / \# \dots \langle 1acc \rangle + (\dots \left[ \begin{smallmatrix} +low \\ v \end{smallmatrix} \right] \langle \overline{1acc} \rangle)_{na\#t.n}$

CN D  $\sigma \rightarrow \langle 1acc \rangle / \# \dots + (\dots \langle \_\_ \rangle S)_{na\#t.n}$

The rules CN A to CN D are in order and a compound noun applies to only one rule. That is, if CN A applies to a compound noun, other rules do not apply to the same compound noun. Therefore, if the first noun is atonic (preaccented), CN A applies to the compound noun, and if the first noun is tonic, CN B, CN C or CN D applies to the compound noun. CN B and CN C are not necessarily in order. If neither CN A, CN B nor CN C applies to a compound noun, then CN D applies.

CN A is interpreted so that a compound becomes atonic if the first noun is atonic:

$/\text{'hige}/ + / \text{'oyazi}/ \rightarrow / \text{'higeoyazi}/$  'a bearded man'

$/\text{'sakura}/ + / \text{'sima}/ \rightarrow / \text{'sakurazima}/$  'Sakurazima (place name)'.

CN B means that when a middle accented noun follows a tonic noun, the accent of a middle accented noun remains:



/budoō/+/hatake/ → /budoobatake/ 'a vineyard'  
 /me/+/kusuri/ → /megusuri/ 'eye lotion'  
 /wata/+/tebukuro/ → /watatebukuro/ 'cotton gloves'  
 /heike/+/monogatari/ → /heikemonogatari/ 'the story of  
 Heike'  
 /kuro/+/kigutu/ → /kurokigutu/ 'black wooden shoes'.

CN C is interpreted so that when the final accented noun is followed by the final accented noun with C [+Low] in its final syllable, an accent is inserted on the boundary following the final syllable of compound:

/yu̯+/+hana̯/ → /yubana̯/ 'a bath with flowers'  
 /hana̯+/+kasa̯/ → /hanagasā/ 'a painted paper parasol'  
 /sumi̯+/+koya̯/ → /sumigoya̯/ 'a charcoal burning shed'  
 /ʔotoko̯+/+namida̯/ → /ʔotokonamida̯/ 'men's tear'.

If the vowel of the last syllable of the compound is [-low], this rule does not apply and CN D applies:

/kawã/+/kutu/ → /kawagutu/ 'leather shoes'  
 /yamã/+/ʔarasi/ → /yamaʔarasi/ 'mountain storm'  
 /sorã/+/mamẽ/ → /soramamẽ/ 'a broad bean'.

CN D inserts an accent on the boundary after the penultimate syllable of a compound when a tonic noun is followed by a noun:

/nihon̄/+/̄tokage/ → /nihontokage/ 'Japanese lizard'  
/tanuki/+/̄hayasi/ → /tanukibayasi/ 'a band of badgers'.

It is wrong to have pitch adjustment rule after CN D to shift the penultimate accent to the last syllable if the vowel of last syllable is [+low] instead of having CN C:

/hāru/+/ʔika/ → /haruʔika/ 'a spring cuttlefish'  
                   ↘ \* /haruʔika/

/mātu/+/kasā/ → /matukasā/ 'a pine cone'.  
                   ↘ \* /matukasā/

We also can hear a free variation if the final vowel of the second noun with two syllables is  $\left[ \begin{smallmatrix} -\text{high} \\ +\text{front} \end{smallmatrix} \right]$ , /e/. The rule for the free variation is as follows:

$$\sigma \rightarrow \langle 1acc \rangle / \# \dots S \ S \langle 1acc \rangle + S \ C \begin{bmatrix} -high \\ +front \\ v \end{bmatrix} \langle \overline{1acc} \rangle \#$$

/namida/+/?ame/ → /namida?ame/ 'a sprinkling rain'  
                               → /namida?ame/ (by CN D)  
 /?otoko/+/?ude/ → /?otoko?ude/ 'man's arm'.  
                               → /?otoko?ude/ (by CN D)

If the second noun does not have two syllables, the free variation does not occur:

/ʔiro/+/megane/ → \*ʔiromegane/ 'tinted glasses'.  
→ /ʔiromegāne/

When the last vowel is  $\begin{bmatrix} -\text{high} \\ +\text{back} \end{bmatrix}$ , /o/, the free variation does not occur:

/watã/+/?itõ/ → /watã?itõ/ 'cotton thread'  
                     ↘ \*/watã?itõ/  
 /hanã/+/mukõ/ → /hanamukõ/ 'a bridegroom'.  
                     ↘ \*/hanamukõ/

The rules for compounds are written in the phonemic level. We need the pitch assignment rules (PA) 1 to 6 in the phonetic level. In the following rules, Rule 0 is only for compound nouns and PA 1 to 4 are general rules which apply not only to all compounds but also to single morphemes.

In the Hirosaki dialect as well as in the Tookyoo dialect, we see free variations. The most noticeable free variation in compounds is seen, when the syllable accented by CN D has a high vowel, then the syllable





/koōmuʔinhoo/ → [koomuʔinhoo] → [koomuʔinhoo]  
 'the National Public Service Law'.

PA 4. [Rank \$] <1acc> → [high-falling] / \$ ....\_ \$

/ʔasayū/ → [ʔasayū] 'morning bath'.

If the final accented syllable is followed by another morpheme, PA 4 does not apply and PA 1 applies to it:

/ʔasayū/#/ʔga/  $\xrightarrow{\text{PA1}}$  [ʔasayūga] 'morning bath (nominative)'  
 $\xrightarrow{\text{PA4}}$  \*[ʔasayūga]

/tisē/%/sūzume/  $\xrightarrow{\text{PA1,3}}$  [tisē % sūzume] 'a small sparrow'.  
 $\xrightarrow{\text{PA4}}$  \*[tisē % sūzume]

## B. Sino-Japanese.

Next I will discuss the compounds with Sino-Japanese nouns as the second elements. Their main difference from native compounds is that, when the Sino-Japanese noun comes as the second noun, the first noun does not affect the accent of the compound.

We need two rules for compound nouns of Sino-Japanese.

CN 1  $\sigma \rightarrow \langle 1acc \rangle / \# \dots + (\dots \langle \overline{1acc} \rangle \dots)_{\text{S-}\#}$

CN 2  $\sigma \rightarrow \langle 1acc \rangle / \# \dots + (\text{S} \langle \_ \rangle \dots)_{\text{S-}\#}$

CN 1 makes the accent of the second noun of a compound predominate:

/ʔikkagētū/+/ʔīnai/ → /ʔikkagetuʔīnai/ 'within one month'

/gun̄zi/+/sikin̄/ → /gunzisikin̄/ 'war funds'

/ʔhatu/+/hoomon̄kyaku/ → /hatuhoomon̄kyaku/ 'the first  
 visitor'

/gensīryoku/+/sensuikan/<sup>10</sup> → /gensiryokusensuikan/  
 'atomic submarine'.

CN 2 inserts an accent on the first syllable after [+]:

/˘syakai/+ /˘seekatu/ → /syakaisẽkatu/ 'social life'

/˘gaikoku/+ /˘booʔeki/ → /gaikokuboōʔeki/ 'foreign trade'

/betu/+ /˘sekai/ → /betusẽkai/ 'different world'.

If an accented syllable after a boundary (any boundary) is short, C(y)V, the accent shifts to the following syllable. This is an accent readjustment rule for Sino-Japanese nouns and compounds.

AR A [Rank %] % (C(y)V<1acc>S...<sub>j</sub>) → % S S<1acc>...

if the accented syllable is not followed  
by only one short syllable.

/bōkusi/ → /bokũsi/ 'a priest'

/sīryoku/<sup>11</sup> → /siryōku/ 'eyesight'

/ʔikkagetu + ʔīnai/ → /ʔikkagetuʔinaī/ 'within one month'

/betu + sēkai/ → /betusekai/ 'different world'

/sewa + kāsoku/ → /sewakazōku/ 'a kind family'.

If the accented syllable is a long syllable, AR A does not apply:

/senryoku/ → \*/senryōku/ 'fighting power'  
→ /senryoku/

/gaikoku + boōʔeki/ → \*/gaikokuboōʔeki/ 'foreign trade'.  
→ /gaikokuboōʔeki/

If the accented syllable is followed by only one short syllable, AR A does not apply:

/bazyoo + kīsi/ → \*/bazyookisi/ 'a knight on a horse'  
→ /bazyookisi/

/ryuukoo + kāsyo/ → \*/ryuukookasyū/ 'a popular singer'.  
→ /ryuukookāsyo/

### C. Other rules for compounds.

I have not discussed compounds with monosyllabic nouns. When monosyllabic nouns come as the second nouns of compounds, the accentuations of the compounds are quite irregular. It is impossible to make ordering rules which apply to all compound nouns with monosyllabic nouns.

McCawley (1968) and Hirayama (1969) give us (a) a list of elements which yield unaccented compounds when used as final element and (b) a list of elements for which compounds ending in them have an accent on the final syllable of the first member.

For example:

(a) /kaŋsai/+/ben/ → /ˈkansaiben/ 'Western (Japanese) dialect'

(b) /ˈkinen/+/ˈbi/ → /kineŋbi/ 'aniversary'.

But it is not so simple in the Hirosaki dialect. The accentuation of a compound is also determined depending on the first noun. Also when some special two-syllable nouns (McCawley and Hirayama give us a list) follow nouns, the accentuation does not follow the compound rules which I have discussed.

When monosyllabic and special two-syllable nouns come as the second elements, we can divide compound nouns which are governed by different rules into five main groups.

## Group A.

When a noun follows an atonic noun, the preaccent of the first noun remains; when it follows a tonic noun, the accent of the last syllable of the compound remains. For atonic nouns CN A applies and for tonic nouns CN 1 applies. Although we already have the same rules, let me make the special rules for compounds (SC):

SC 1  $\sigma \rightarrow \langle 1\text{acc} \rangle / @ \langle \overline{1\text{acc}} \rangle \dots \% \dots @$

SC 2  $\sigma \rightarrow \langle 1\text{acc} \rangle / @ \dots \% \dots \langle \overline{1\text{acc}} \rangle @$

ben̄ 'dialect'

/ˈtookyoɔ/+/ben̄/  $\xrightarrow{\text{SC1}}$  /ˈtookyooben/ 'the Tookyoo dialect'

/hirosāk̄i/+/ben̄/  $\xrightarrow{\text{SC2}}$  /hirosakiben̄/ 'the Hirosaki dialect'

/k̄ansai/+/ben̄/  $\xrightarrow{\text{SC2}}$  /kansaiben̄/ 'Western dialect'

ˈkatā 'form'

/ˈkihuku/+/ˈkatā/  $\xrightarrow{\text{SC1}}$  /ˈkihukugata/ 'tonic pattern'

/nakadakā/+/ˈkatā/  $\xrightarrow{\text{SC2}}$  /nakadakagatā/ 'middle accented  
pattern'

/san̄k̄eku/+/ˈkatā/  $\xrightarrow{\text{SC2}}$  /sankakugatā/ 'triangle'.

When /kata/ is pronounced in isolation, it is [katā]; /kata/ has a preaccent, and when it follows tonic nouns, the accent is on the final, /...katā/. Therefore, I assume that /kata/ has two accents in the underlying form, the preaccent and the accent on the final syllable.

All special rules for compounds are in the rank [ @ ]. The rules apply not only to compound nouns but also to other compounds (nouns plus particles, adjectives plus



particles, verbs plus auxiliary verbs, etc.). For a compound noun, the rank of the rules is [#], for the compound with a particle, the rank of the rules is [%], and for the compound with a auxiliary verb, the rank of the rules is [⊙] or less than [⊙].

For example:

%/ʰana/#/māde/%  $\xrightarrow{SC1}$  /ʰanamade/'even a nose'

⊙/ʰana/%/dā/⊙  $\xrightarrow{SC1}$  /ʰanada/'(it) is a nose'

Group B.

When a monosyllabic noun follows a noun, an accent on the second noun remains, SC 2:

zyuū 'throughout'

/kyuūsyuu/+/zyuū/ → /kyuusyuuzyuū/'throughout Kyuusyuū'

/hirosāki/+/zyuū/ → /hirosakizyuū/'throughout Hirosaki'

/nihon/+/zyuū/ → /nihonzyuū/'throughout Japan'

/ʰtookyoo/+/zyuū/ → /tookyoozyuū/'throughout Tookyoo'.

As I have mentioned before, the rules, in order, cannot apply to the compounds with monosyllabic and special two-syllable nouns. Different rules are applied to the compounds in each group. SC 1 seems to be applied to /ʰtookyoo/+/zyuū/ but it is not, because /zyuū/ belongs to a different group (Group B). Each group is determined by the rules which apply to the compound of each group. Thus, although the rule (SC 2) applies to Group B and also applies to Group A, these groups are divided into different groups because another

rule (SC 1) applies to Group A.

Group C.

When some nouns follow preaccented or initial accented nouns, the final syllable of the first noun has an accent. In other words, the preaccent of the second noun remains. When the first noun is a middle accented or final accented noun, an accent on the first noun remains:

SC 3     $\sigma \rightarrow \langle 1\text{acc} \rangle / @ (S) \langle 1\text{acc} \rangle \dots \% \langle \overline{1\text{acc}} \rangle \dots @$

SC 4     $\sigma \rightarrow \langle 1\text{acc} \rangle / @ \dots \langle \overline{1\text{acc}} \rangle \dots \% \dots @$

ˈbo 'register'

/toōroku/+ˈbo/  $\xrightarrow{\text{SC3}}$  /toorokūbo/ 'list of registration'

/ˈzinmei/+ˈbo/  $\xrightarrow{\text{SC3}}$  /zinmeībo/ 'roll (list of names)'

/ˈʔuri age/+ˈbo/  $\xrightarrow{\text{SC3}}$  /ʔuriʔagebo/ 'a sales book'

/kaikeī/+ˈbo/  $\xrightarrow{\text{SC4}}$  /kaikeībo/ 'an account book'

ˈkyōku 'bureau'

/kañri/+ˈkyoku/  $\xrightarrow{\text{SC3}}$  /kanrikyoku/ 'administration office'

/ˈyuubin/+ˈkyoku/  $\xrightarrow{\text{SC3}}$  /yuubiñkyoku/ 'post office'

/hirosākī/+ˈkyoku/  $\xrightarrow{\text{SC4}}$  /hirosākikyoku/ 'Hirosaki office'.

When /kyoku/ is pronounced in isolation, it is [kyōku]. Therefore, there are two underlying accents in the word /kyoku/, and when it follows a preaccented or initial accented noun, the preaccent remains.

Group D.

In Group C, I have mentioned that when the initial accented noun is followed by a preaccented noun, the

preaccent of the second noun remains. But in Group D, only when an atonic noun is followed by a preaccented noun, the preaccent of the second noun remains. When a tonic noun is followed by a noun, SC 4 applies. SC 5 precedes SC 4.

SC 5      $\sigma \rightarrow \langle 1acc \rangle / @ \langle 1acc \rangle \dots \% \langle \overline{1acc} \rangle \dots @$

ˈsen ˈship'

/ˈseikan/+/ˈsen/  $\xrightarrow{SC5}$  /seikanˈsen/ 'the ship which runs  
between Aomori and Hakodate'

/ˈrenraku/+/ˈsen/  $\xrightarrow{SC5}$  /renrakusen/ 'a ferry boat'

/kaŋsi/+/ˈsen/  $\xrightarrow{SC4}$  /kaŋsisen/ 'a watch ship'

/gyogyoo/+/ˈsen/  $\xrightarrow{SC4}$  /gyogyooˈsen/ 'a fishing boat'.

When /sen/ is pronounced in isolation, it is [sen̄].

Therefore, there are two underlying accents in /sen/.

The nouns in Group D are Sino-Japanese monosyllabic nouns which have preaccents in the underlying forms; by SC 5, only the penultimate syllable has an accent. If the accented penultimate syllable (by SC 5) is /C(y)V/, the accent shifts to the final syllable of a compound. The accent readjustment rule for a monosyllable is as follows:

AR B [Rank %]      $\dots C(y)V \langle 1acc \rangle s_j \% \rightarrow \dots s s \langle 1acc \rangle \%$

This readjustment rule is only applied to Group D and is a similar rule to AR A which shifts the accent of the initial syllable to the next. Both rules shift accents (if the accented syllables are /C(y)V/) to the following syllables:

/renrakusen/ → /renrakusen̄/ 'a ferry boat'.

group E.

In the last group the accent on the first noun remains (SC 4).

ˊkin̄ 'money'

/hozyō̄+/kin̄/ → /hozyō̄kin/ 'a grand-in-aid'

/gun̄bi+/kin̄/ → /gun̄bikin/ 'money for military preparations'

/ˊhaken+/kin̄/ → /ˊhakenkin/ 'money to sent'.

When /kin/ is pronounced in isolation, it is accented, [kin̄]. It has an accent on the syllable. When /kin/ follows an atonic noun, we also hear a free variation: /ˊhaken+/ˊkin/ → /haken̄kin/.

But /kin/ does not belong to Group D because AR B does not apply to the compound:

/hozyō̄kin/  $\xrightarrow{\text{ARB}}$  \*/hozyokin̄/.

yamā 'mountain'

/niinā+/yamā/ → /niinayama/ 'Mt. Niina'

/ˊiwaki+/yamā/ → /ˊiwakiyama/ 'Mt. Iwaki'

/ˊteppoo+/yamā/ → /ˊteppooyama/ 'Mt. Teppoo'

/ˊyakagi+/yamā/ → /ˊyakagiyama/ 'Mt. Yakagi'.

When CN D applies to the compound with /yama/ as the second element, the meaning of the compound is "a mountain (or mountains) in a certain area", and when SC 4 applies, its meaning is "the name of a mountain".

/niinā+/yamā/  $\xrightarrow{\text{CND}}$  /niinayamā/ 'mountains in Niina'.

## 2c. Nouns plus particles.

We can divide particles into two groups for noun-particle compounds.

## Group A.

Each noun has at least one accent in it, but there is no stipulation for putting a preaccent on a monosyllabic particle. When /ga/ (nominative) follows a noun, an accent in the noun remains. This is the same rule as SC 4, although there is an internal word boundary between nouns in compounds, and there is a word boundary between a noun and a particle. We will have the same surface form even if we put a preaccent on /ga/, e.g. /ˈga/, if we apply SC 4, but there is no way to prove that /ga/ has a preaccent, because it never comes at the beginning of a sentence, nor preaccents its preceding syllable:  
 /ˈʔame/#/ˈga/ → \*ʔameˈga/, /kūzira/#/ˈga/ → \*kuzirāga/.  
 Although there is no proof that a monosyllabic particle has a preaccent, I assume that it has a preaccent and it is classified into the same group as the particle which has an accent on the first syllable, /dāge/, /kāramo/, etc.

When a particle in Group A follows an atonic noun, the preaccent of a noun remains (SC 1):

/ˈha/#/ˈga/  $\xrightarrow{\text{SC1}}$  /ˈhaga/  $\xrightarrow{\text{PA2}}$  [hagā] 'a leaf (nominative)'  
 /ˈmizu/#/kāramo/  $\xrightarrow{\text{SC1}}$  /ˈmizukaramo/  $\xrightarrow{\text{PA2}}$  [mizukaramō]  
 'also from water'.

I have mentioned that SC 4 applies to the compound

in which /ᵑga/ follows, but it does not apply to the compound in which /kāramo/ follows a final accented noun. When a particle follows a final accented noun, the accent on a particle remains. The particle rule (P) is as follows:

P 1 [Rank %]  $\sigma \rightarrow \langle 1acc \rangle / \% \dots \langle 1acc \rangle \# (\dots \langle \overline{1acc} \rangle \dots)_{pt.} \%^{12}$   
av.

As this rule shows, although it is not necessary to put a preaccent into the monosyllabic particle, such as /ga/, it should have a preaccent to include /ga/ in the same group with /kāramo/ and to let P 1 apply to the compound with a monosyllabic particle:

/yamã/#/ᵑga/  $\xrightarrow{P1}$  /yamāga/  $\xrightarrow{PA1}$  [yamāga] 'a mountain (nom.)'  
/yamã/#/kāramo/  $\xrightarrow{P1}$  /yamakāramo/  $\xrightarrow{PA1}$  [yamakāramo]  $\xrightarrow{PA3}$   
[yamakāramo] 'also from a mountain'.

The compound above clearly shows that /ka/ of /karamo/ has an accent in the underlying form because /ma/ of /yama/ becomes high-pitched when /ᵑga/ follows and it does not become high-pitched when /kāramo/ follows.

When a particle follows initial and middle accented nouns, the accent on the nouns remains (SC 4):

/ᵑinōti/#/ᵑga/  $\xrightarrow{SC4}$  /ᵑinōtiga/  $\xrightarrow{PA1}$  [ᵑinōtiga]  $\xrightarrow{PA3}$   
[ᵑinōtiga] 'a life (nominative)'  
/hōtaru/#/kāramo/  $\xrightarrow{SC4}$  /hōtarukaramo/  $\xrightarrow{PA1}$  [hōtarukaramo]  
 $\xrightarrow{PA3}$  [hōtarukaramo] 'also from a firefly'.

Among monosyllabic particles, /ᵑba/ (objective) and /ᵑsa/ 'to' have final accents as alternations, /ᵑbā/ and /ᵑsā/. When they follow final accented nouns, each

accent on particles remains (P 1):

/hā/#/'bā/ → /hāba/ <sup>f</sup> /habā/'a tooth (objective)'

/yamā/#/'bā/ → /yamāba/ <sup>f</sup> /yamabā/'a mountain (obj.)'.

CN C also applies to the compounds of the final accented. It will be better to use only one rule, P1, here. The ordering of rules which are used for Group A should be CN A, P 1, SC 4 and PA's.

I have mentioned earlier that /ōō/ becomes /ōō/ if the last vowel is [-high], but it is not so when particles follow nouns:

/kī/#/'no/ → /kīno/ → \*/kinō/'of a tree'.

Therefore, the rule to shift the accent of the first syllable to the second is applied to crossing over [+] (an internal word boundary), or [&] (a morpheme boundary, like /mī/&/ta/ → /mīta/ → /mitā/'saw (past tense)') or is applied within a word boundary in native Japanese; that is, the rule applies in the rank [#]. This shifting rule does not apply to Sino-Japanese words, foreign words and interjections:

Sino-Japanese: /kākō/'past', /tōga/'cross a river',

/tāma/'Tama (a place name)', etc.

Foreign: /pāpa/'father', /dēmo/'demonstration', /dēma/'demagogy', /māma/'mother', etc.

Interjection: /ʔāra/, /hāte/, /sōre/, /sōra/, etc.

Group B.

When a particle in Group B follows an atonic noun,

the preaccent of a particle remains (SC 5):

$\text{/'ha/\#/'sika/} \xrightarrow{\text{SC5}} \text{/hāsika/} \xrightarrow{\text{PA1}} [\text{hāsika}] \xrightarrow{\text{PA3}} [\text{hāsika}]$   
 'only a leaf'  
 $\text{'mizu/\#/'yorimo/} \xrightarrow{\text{SC5}} \text{/mizūyorimo/} \xrightarrow{\text{PA1}} [\text{mizūyorimo}] \xrightarrow{\text{PA3}} [\text{mizūyorimo}]$   
 'rather than water'.

When a particle follows a tonic noun, the accented syllable and its following syllables, if any, have accents. We cannot apply SC 4 (by which an accent remains on the first element) because PA 3 cannot apply:

1. /hã/#/ʔhodo/  $\xrightarrow{\text{SC4}}$  /hãhodo/  $\xrightarrow{\text{PA1}}$  [hãhodo]  $\xrightarrow{\text{PA3}}$  \*[hãhodo]  
'as a tooth'
2. /tanũki/#/ʔhodo/  $\xrightarrow{\text{SC4}}$  /tanũkihodo/  $\xrightarrow{\text{PA1}}$  [tanũkihodo]  
 $\xrightarrow{\text{PA3}}$  \*[tanũkihodo] 'as a badger'
3. /kũzira/#/ʔhodo/  $\xrightarrow{\text{SC4}}$  /kũzirahodo/  $\xrightarrow{\text{PA1}}$  [kũzirahodo]  
 $\xrightarrow{\text{PA3}}$  \*[kũzirahodo] 'as a whale'.

The surface forms of 1, 2 and 3 are [ $\overline{\text{hahodo}}$ ], [ $\overline{\text{tanukihodo}}$ ] and [ $\overline{\text{kuzirahodo}}$ ] respectively. Then we have to have another particle rule:

$$P^2 \left[ \text{Rank } \% \right] \sigma \rightarrow \langle 1acc \rangle / \% \dots S \langle \overline{1acc} \rangle (S \_\_)_{0\#}^n (\dots)_{pt\%} \text{av.}$$

P 2 puts an accent over the accented syllable of a noun and puts accents over the syllables of the noun following the accented syllable, and PA 3 does not apply after P 2:

/yamã/#/ʔhodo/ P2 /yamāhodo/ PA1 [yamāhodo] 'as a mountain'

/ʔinōti/#/ʔsika/ P2 /ʔinotīsika/ PA1 [ʔinotīsika] 'only a life'

/hōtaru/#/ʔyorimo/ P2 /hotaruyorimo/ PA1 [hotaruyorimo] 'rather than a firefly'.

When the phrase of a noun plus a particle follows



another morpheme, the syllables which follow the high-pitched syllable become high-pitched.

PA 5 [Rank ⑤]

[ ] → [high pitch]/ ⑤ ...[high pitch]( )<sub>0</sub><sup>n</sup> ⑤....

[yagisa@mizukoto%kerozya] → [yagisa@mizukoto%kerozya]  
'Give the goat water'

[nikuyorimo@kamiba%taberu] → [nikuyorimo@kamiba%taberu]  
'(it)eats papers rather than meat'.

PA 5 is a general rule. It applies not only to compounds but also to a single word:

/kuzira/%/kero/  $\xrightarrow{\text{PA1,3,4}}$  [kuzira%kero]  $\xrightarrow{\text{PA5}}$  [kuzira%kero]  
'give (me) a whale'.

The particles in Group A and Group B are as follows:

Group A.

/ga/(nominative), /ba/(objective), /ni/(objective),  
/to/'and', /sa/'to', /wa/(nominative), /mo/'also',  
/ga/(question), /na/(question), /ge/(question, doubt),  
/?o/(objective), /dage/'only', /gara/'from', /basi/'only',  
/dano/'etc.', /demo/'even', /dabega/'question, doubt',  
/dakeni/'only to', /karamo/'also from', /made/'till'.

Group B.

/sika/'only', /hodo/'as', /yori/'than', /gure/'about',  
/nari/(objective, uncertain), /koto/(objective, from the  
noun /koto/'thing'), /yorimo/'more than', /nowa/'the one  
of (nominative)'.

The accents when particles follow nouns are as follows (The following accents of compounds are written phonetically):

			A	
atonic		1 syl.	˘ha 'leaf'	hanō      hadagē
		2 syl.	˘mizu 'water'	mizunō      mizudagē
		3 syl.	˘sakura 'cherry tree'	sakuranō      sakuradagē
		4 syl.	˘nokogiri 'a saw'	nokogirinō      nokogiridagē
tonic	final	1syl.	kī 'tree'	kīno      kidagē
		2syl.	yamā 'mountain'	yamāno      yamadagē
		3 syl.	?atamā 'head'	?atamāno      ?atamadagē
		4 syl.	?asaga?ō 'morning glory'	?asaga?ono      ?asaga?odagē
	middle	3 syl.	?inōti 'life'	?inotino      ?inotidagē
		4 syl.	kudamōno 'fruit'	kudamonono      kudamonodagē
	initial	2 syl.	hāru 'spring'	haruno      harudagē
		3 syl.	hōtaru 'firefly'	hotaruno      hotarudagē

A	B	
<p>hadabegā</p> <p>mizudabegā</p> <p>sakuradabegā</p> <p>nokogiridabegā</p>	<p>hahodo</p> <p>mizuhodo</p> <p>sakurahodo</p> <p>nokogirihodo</p>	<p>hayorimo</p> <p>mizuyorimo</p> <p>sakurayorimo</p> <p>nokogiriyorimo</p>
<p>kidabega</p> <p>yamadabega</p> <p>?atamadabega</p> <p>?asaga odabega</p>	<p>kihodo</p> <p>yamahodo</p> <p>?atamahodo</p> <p>?asaga?ohodo</p>	<p>kiyorimo</p> <p>yamayorimo</p> <p>?atamayorimo</p> <p>?asaga?oyorimo</p>
<p>?inotidabega</p> <p>kudamonodabega</p>	<p>?inotihodo</p> <p>kudamonohodo</p>	<p>?inotiyorimo</p> <p>kudamonoyorimo</p>
<p>harudabega</p> <p>hotarudabega</p>	<p>haruhodo</p> <p>hotaruhodo</p>	<p>haruyorimo</p> <p>hotaruyorimo</p>

## 2d. Nouns plus auxiliary verbs.

There are two groups.

## Group A.

When the auxiliary verb<sup>13</sup> /da/ 'be(present tense)' follows a noun, the accent in the noun remains (SC 4):

/ˈsakura/%/da/  $\xrightarrow{SC4}$  /ˈsakurada/  $\xrightarrow{PA2}$  [sakuradā]  
 '(it) is a cherry tree'

/ʔatama/%/da/  $\xrightarrow{SC4}$  /ʔatamadā/  $\xrightarrow{PA1}$  [ʔatamadā] '(it) is a head'

/tanuki/%/da/  $\xrightarrow{SC4}$  /tanukida/  $\xrightarrow{PA1}$  [tanukida]  $\xrightarrow{PA3}$  [tanukida]  
 '(it) is a badger'

/hāru/%/da/  $\xrightarrow{SC4}$  /hāruda/  $\xrightarrow{PA1}$  [hāruda]  $\xrightarrow{PA3}$  [hāruda]  
 '(it) is a spring'.

It seems that there is no way to prove whether /da/ has an accent or not. We have an alternative accentuation when /da/ follows a final accented noun. As its alternative accent, /da/ has an accent over the syllable; /dā/ and CN C applies:

/kī/%/dā/  $\xrightarrow{CNC}$  /kida/  $\xrightarrow{PA4}$  [kida] '(it) is a tree'

/yamā/%/dā/  $\xrightarrow{CNC}$  /yamada/  $\xrightarrow{PA4}$  [yamada] '(it) is a mountain'

/ʔatamā/%/dā/  $\xrightarrow{CNC}$  /ʔatamada/  $\xrightarrow{PA4}$  [ʔatamada] '(it) is a head'.

It is clear that /da/ is the final accented morpheme, but the evidence of its preaccent is not clear and there is no way to prove it. It is an arbitrary explanation to say that /da/ has no accent, and /kida/ becomes /kida/ because the vowel of the last syllable is [-high], and also /yamada/ → /yamada/ and /ʔatamada/ → /ʔatamada/. As I have mentioned already, the rule to shift the accent to the next syllable, [-high], only applies to two syl-

lables:

/mī/&/ta/ → /mīta/ → /mita/ 'saw (past tense)'.

But

/tabē/&/ta/ → /tabēta/ → \*/tabeta/ 'ate (past tense)'

/ʔiki/&/ta/ → /ʔikīta/ → \*/ʔikita/ 'lived (past)'.

Group B.

When an auxiliary verb in Group B follows an atonic noun and a final accented noun, the accent of the auxiliary verb remains (AV 1):

AV 1 [Rank @]  $\sigma \rightarrow \langle 1\text{acc} \rangle / @ \dots \% (\dots \langle \overline{1\text{acc}} \rangle \dots)_{\text{AV}} @$

/ʔha/%/ʔsi/  $\xrightarrow{\text{AV1}}$  /hāsī/  $\xrightarrow{\text{PA1}}$  [hāsī] '(it) is a leaf(polite)'

/ʔame/%/daṇḍe/  $\xrightarrow{\text{AV1}}$  /ʔamedāṇḍe/  $\xrightarrow{\text{PA1}}$  [ʔamedāṇḍe]  
'(it) is a candy (I believe)'

/ʔha/%/dāʔenta/  $\xrightarrow{\text{AV1}}$  /hadāʔenta/  $\xrightarrow{\text{PA1}}$  [hadāʔenta]  
'(it) looks like a leaf'

/hā/%/ʔsi/  $\xrightarrow{\text{AV1}}$  /hāsī/  $\xrightarrow{\text{PA1}}$  [hāsī] '(it) is a tooth(polite)'

/ʔame/%/daṇḍe/  $\xrightarrow{\text{AV1}}$  /ʔamedāṇḍe/  $\xrightarrow{\text{PA1}}$  [ʔamedāṇḍe]  
'(it) is a rain (I believe)'

/hā/%/dāʔenta/  $\xrightarrow{\text{AV1}}$  /hadāʔenta/  $\xrightarrow{\text{PA1}}$  [hadāʔenta]  
'(it) looks like a tooth'.

As we see above, the compounds with atonic and final accented nouns are identical, but they are not so on the surface forms. When an auxiliary verb follows an atonic noun, the accent of the auxiliary remains and its following syllable also becomes high-pitched on the surface form. Therefore, we need an additional pitch assignment rule to apply to the compound whose noun is atonic:

PA 6 [Rank ②]

[ ] → [high pitch] / ②...[high pitch]\_\_\_\_. )<sub>av</sub> ②

[hasi] → [hasi] '(it) is a leaf (polite)'

[?amedande] → [?amedande] '(it) is a candy (I believe)'

[hada?enta] → [hada?enta] '(it) looks like a leaf'.

Suppose that the syllable following the accented syllable becomes accented by the following rule instead of applying three different rules (AV 1, PA 1 and PA 5) to the compound with an atonic noun as the first element.

$\sigma \rightarrow <1acc> / \textcircled{2} (<1acc>...)_n \% (...<1acc>S \text{ --- } ..)_av \textcircled{2}$

Then /na/%/si/ → /hasi/  $\xrightarrow{PA4}$  \* [hasi]

/?ame/%/dande/ → /?amedande/  $\xrightarrow{PA4}$  \* [?amedande].

Therefore, the syllable following the accented syllable which becomes high-pitched by PA 6 is not considered as having an accent in the underlying form.

When a noun is followed by an auxiliary verb in Group A, PA 3 cannot be applied:

/na/%/da?enta/  $\xrightarrow{AV1}$  /hada?enta/  $\xrightarrow{PA1}$  [hada?enta]  $\xrightarrow{PA3}$   
\* [hada?enta] '(it) looks like a tooth'.

When middle accented and initial accented nouns are followed by an auxiliary verb, the accents of the nouns and of the auxiliary verb remain and the syllables between accented syllables also becomes high-pitched by PA 5.

AV 2 [Rank ②]

$\sigma \rightarrow <1acc> / \textcircled{2} (...S <1acc>S...)_n \% (...<1acc>...)_av \textcircled{2}$

/ʔinōti/%ʔsi/  $\xrightarrow{AV2}$  /ʔinotisi/  $\xrightarrow{PA1}$  [ʔinotisi]  
 '(it)is a life (polite)'

/hōtaru/%dāʔenta/  $\xrightarrow{AV2}$  /hōtaru%dāʔenta/  $\xrightarrow{PA1}$  [hōtaru%  
 dāʔenta]  $\xrightarrow{PA5}$  [hotarudāʔenta] '(it) looks like a firefly'.

AV 2 must precede AV 1 because AV 1 should not apply to the compound with the middle or initial accented noun. If AV 1 applies before AV 2, the result is as follows:

/hōtaru/%dāʔenta/  $\xrightarrow{AV1}$  \*/hotarudāʔenta/.

The auxiliary verb in Group A is /dā/'be'. The auxiliary verbs in Group B are as follows:

/ʔsi/'be', /ʔmite/'like', /ʔse/'will be, be', /dānde/'be (confirmative)', /dādo/'be said', /dēsu/'be', /dābe/'will be, be', /dākenta/ or /dāʔenta/'look like, probably', /dēgosi/'be (very polite)'.

The accents when auxiliary verbs follow nouns are as follows:

		A	B		
atonic		ᵀha	hadā	hasi	hadāᵀenta
		ᵀmizu	mizudā	mizusi	mizudāᵀenta
		ᵀsakura	sakuradā	sakurasi	sakuradāᵀenta
		ᵀnokogiri	nokogiridā	nokogirisi	nokogiridāᵀenta
tonic	final	kiᵀ	kidā	kisi	kidāᵀenta
		yamaᵀ	yamadā	yamasi	yamadāᵀenta
		ᵀatamaᵀ	ᵀatamadā	ᵀatamasi	ᵀatamadāᵀenta
		ᵀasagaᵀoᵀ	ᵀasagaᵀodā	ᵀasagaᵀosi	ᵀasagaᵀodāᵀenta
	middle	ᵀinōti	ᵀinotida	ᵀinotisi	ᵀinotidaᵀenta
		kudamōno	kudamonōda	kudamonosi	kudamonōdaᵀenta
	initial	hāru	haruda	harusi	harudaᵀenta
		hōtaru	hotaruda	hotarusi	hotarudaᵀenta



### 3. Verbs.

There are two types of accent patterns in verb stems:

#### a) Atonic pattern

/ʌʔok/'put', /ʌmor/'fill', /ʌʔakas/'prove', etc.

#### b) Final accented pattern.

/haer̄/'enter', /toor̄/'pass', /kangaē/'think', etc.

#### 3a. Stems plus suffixes.

I will discuss the accents of verb stems plus suffixes by using phonological and morphophonemic rules. Most of the rules follow Professor Fillmore's rules which we were discussed in the class of Japanese Syntax, Spring Quarter, 1969.

#### 1) Indicative form.

##### a) Present form.

The suffix of indicative form is /ru/. When /ru/ is put after consonant-stem verbs, /r/ is deleted:

/kak̄/&/ru/ → /kak̄u/'write'

/ʌʔasob/&/ru/ → /ʌʔasobu/'play'.

When accented stems are followed by unaccented suffixes, the accents on the stems remain:

Rule 1 [Rank #]  $\sigma \rightarrow \langle 1acc \rangle / \# \dots S \langle \overline{1acc} \rangle \& \dots \langle -acc \rangle \dots \#$

When atonic stems are followed by suffixes, the words are preaccented:

Rule 2 [Rank #]  $\sigma \rightarrow \langle 1acc \rangle / \# \langle \overline{1acc} \rangle \dots \& \dots \#$   
except the suffix is /is̄/.

## b) Negative form.

The suffix of negative indicative form is /anē/.

When /anē/ is put after vowel-stem verbs, /a/ is deleted:

/tuke/ & /anē/ → /tuke<sup>̄</sup>ne/ 'not to put'

/ʔake/ & /anē/ → /ʔake<sup>̄</sup>ne/ 'not to open'.

When /ane/ is put after consonant-stem verbs, /a/ is not deleted:

/kak/ & /ane/ → /kake<sup>̄</sup>ne/ 'not to write'

/yom/ & /ane/ → /yome<sup>̄</sup>ne/ 'not to read'.

Rule 3. [Rank \$]      (i) C → ∅ / C \_\_  
                              (ii) V → ∅ / V \_\_

When an accented stem verb is combined with an accented suffix, the right-most accent remains.

Rule 4 [Rank #]      σ → <1acc> / #...S<1acc> & ...S<1acc>...#  
 /tuke/ & /anē/ <sup>3</sup>→ /tuke<sup>̄</sup>ne/ <sup>4</sup>→ /kuke<sup>̄</sup>ne/.

In final accented consonant-stem verbs, I consider CVC as a syllable. When /..CVC<sup>̄</sup>/ is followed by an unaccented suffix which begins with a vowel, /..CVC<sup>̄</sup>&V/ becomes /..CVCV/ (i). When a syllable is followed by a suffix /(V)C<sup>̄</sup>/, the accent shifts one phoneme to the left (ii):

/..S&(V)C<sup>̄</sup>&V/ → /..S(V)<sup>̄</sup>CV/

Rule 5 (i) CVC<sup>̄</sup>&V → CVCV  
 (ii) S&(V)C<sup>̄</sup>&V → S(V)<sup>̄</sup>CV

## c) Polite form.

The suffix of a polite form is /is̄/.

$/\text{ʔake}/\&/\text{is}/\&/\text{ru}/ \xrightarrow{3} / \text{ʔake}\bar{\text{s}}\text{u}/ \xrightarrow{4} / \text{ʔake}\bar{\text{s}}\text{u}/ \xrightarrow{5} / \text{ʔake}\bar{\text{s}}\text{u}/$   
 $/\text{nom}/\&/\text{is}/\&/\text{ru}/ \xrightarrow{3} / \text{nom}\bar{\text{i}}\bar{\text{s}}\text{u}/ \xrightarrow{4} / \text{nom}\bar{\text{i}}\bar{\text{s}}\text{u}/ \xrightarrow{5} / \text{nom}\bar{\text{i}}\text{su}/.$

## 2) Gerund form.

The suffix of a gerund form is /ite/. Gerund morphophonemic rules are from Rule 6 to Rule 10. These rules just follow Fillmore's. Rule 3 applies before Rule 6 and Rule 4 applies after Rule 6.

Rule 6. "I" loss.

$i \rightarrow \emptyset / C \_ t$  except  $C=s$

Rule 7. Assimilative voicing.

$t \rightarrow d / [\text{voiced occlusive}] \_$  exclude  $r, w^{14}$

Rule 8. Velar changing to "I".

$[\text{velar}] \rightarrow i / \_ [\text{dental}]$

Rule 9. Dental assimilation.

$C \rightarrow [+dental] / \_ T$

Rule 10. Nasal dissimilation.

$\begin{bmatrix} +\text{voiced} \\ +\text{dental} \end{bmatrix} \rightarrow [+nasal] / \_ d$

The demonstration of gerund morphophonemic rules is as follows:

$/\text{tuke}/\&/\text{ite}/ \xrightarrow{3} / \text{tuke}\bar{\text{t}}\text{e}/$  'sticking'

$/\text{kak}/\&/\text{ite}/ \xrightarrow{6} / \text{kak}\bar{\text{t}}\text{e}/ \xrightarrow{8} / \text{ka}\bar{\text{i}}\bar{\text{t}}\text{e}/$  'writing'

$/\text{ʔkaw}/\&/\text{ite}/ \xrightarrow{2,6} / \text{ʔkaw}\bar{\text{t}}\text{e}/ \xrightarrow{9} / \text{ʔkat}\bar{\text{t}}\text{e}/$  'buying'

$/\text{hanas}/\&/\text{ite}/ \xrightarrow{5} / \text{han}\bar{\text{s}}\bar{\text{i}}\text{te}/$  'speaking'

$/\text{ʔtob}/\&/\text{ite}/ \xrightarrow{2,6} / \text{ʔtob}\bar{\text{t}}\text{e}/ \xrightarrow{7} / \text{ʔtob}\bar{\text{d}}\text{e}/ \xrightarrow{9} / \text{ʔtod}\bar{\text{d}}\text{e}/ \xrightarrow{10}$

$/ \text{ʔton}\bar{\text{d}}\text{e}/$  'flying'.

## 3) Past form.

The suffix of a past form is /ita/ and its morphophonemic rules are the same as gerund morphophonemic rules (I call the suffixes /ite/ and /ita/ as T-suffixes):

/nom̃/&/ita/  $\xrightarrow{6}$  /nom̃ta/  $\xrightarrow{7}$  /nom̃da/  $\xrightarrow{9}$  /noṇda/ 'drank'.

When the syllable of an accented consonant-stem verb is followed by a T-suffix after applying Rule 10, the accent shifts to the next syllable:

Rule 11. Right shift to T-suffix.

$CVC<1acc>S \rightarrow S<-acc>S<1acc>$

/noṇda/  $\rightarrow$  /nondã/, /hasitt̃a/  $\rightarrow$  /hasittā̃/.

Rule 11 does not apply to a vowel-stem verb:

/tabēta/  $\rightarrow$  \*/tabetã/ 'ate'

/nigēta/  $\rightarrow$  \*/nigetã/ 'escaped'.

Rule 11 shifts an accent only to T-suffixes:

/ʔik̃ka/  $\rightarrow$  \*/ʔikkã/ 'a family'

/kaṇsa/  $\rightarrow$  \*/kansã/ 'inspection'.

As I have already discussed in connection with compound nouns, when the first syllable has an accent and the vowel of the second syllable is [-high], the accent on the first syllable moves to the second syllable:

Rule 12. Right shift to second syllable.

$\left[ \begin{smallmatrix} +native \\ Rank \# \end{smallmatrix} \right] \# S<1acc>C \left[ \begin{smallmatrix} -high \\ V \end{smallmatrix} \right] \# \rightarrow S<-acc>S<1acc> \#$

/mī/&/ita/ → /mīta/ → /mita/ 'saw'

/mī/&/ite/#/ʔi/&/ru/ → /mīte/#/ʔiru/ <sup>12</sup> /miteru/ 'be looking'.

As I have mentioned already, Rule 12 only applies to native words:

/dēmo/ → \*/dēmō/ 'demonstration' (foreign)

/tōho/ → \*/tohō/ 'walking' (Sino-Japanese)

/hige/ → \*/higē/ 'humility' (Sino-Japanese).

According to Rule 12, /mī/&/na/ should be /minā/, but we have /mīna/ 'do not see'. The suffix /ru/ is deleted after Rule 12.

Rule 13. "(R)u" loss.

ru → ∅ / \_\_ na

/mī/&/ru/&/na/ → /mīna/.

/w/ occurs only before /a/ in the Tookyoo dialect, but in the Hirosaki dialect, /w/ is deleted even before /a/ when it is followed by a suffix.

Rule 14. "W" deletion.

w → ∅ / \_\_ & V

/ʔkaw/&/isʔ/&/ru/ <sup>3,4</sup> /kawiʔsu/ <sup>5</sup> /kawīsu/ <sup>14</sup> /kaīsu/  
/ʔomowʔ/&/aneʔ/ <sup>4</sup> /ʔomowaneʔ/ <sup>14</sup> /ʔomoaneʔ/.

Rule 15. Vowel devoicing.

$$\left[ \begin{array}{c} +\text{high} \\ -\text{acc} \\ \text{V} \end{array} \right] \rightarrow [-\text{voice}] / \left[ \begin{array}{c} -\text{voice} \\ \text{C} \end{array} \right] - \left[ \begin{array}{c} -\text{voice} \\ \text{C} \end{array} \right]$$

/tukeʔ/&/isʔ/&/ru/ <sup>3,5</sup> /tukeʔsu/ <sup>15</sup> /tukeʔsu/ 'put'

/tateʔ/&/isʔ/&/ita/ <sup>3,5</sup> /tateʔsita/ <sup>15</sup> /tateʔsita/ 'built'

/ʔoti/&/iteʔ/ <sup>3,4</sup> /ʔotiteʔ/ <sup>15</sup> /ʔotiteʔ/ 'want to fall'.

Rule 16. Consonant voicing.

$$\left[ \begin{smallmatrix} C \\ -\text{voice} \end{smallmatrix} \right] \rightarrow [+voice] / \left[ \begin{smallmatrix} V \\ +\text{voice} \end{smallmatrix} \right] - \left[ \begin{smallmatrix} V \\ +\text{voice} \end{smallmatrix} \right]$$

/tatēte/ → /tadēde/ 'building'

/ʔaketa/ → /ʔageda/ 'opened'.

But /tatēsita/ → /tadēsita/.

As one exception, there is the suffix /ite/ 'want to'.

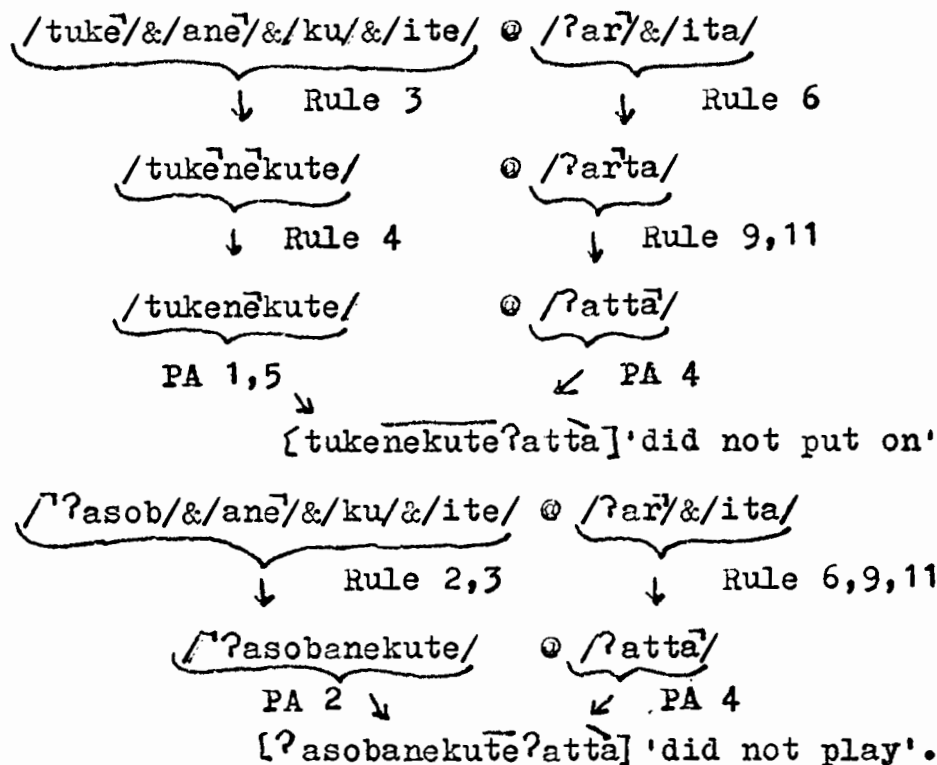
/t/ of /ite/ never becomes voiced:

/mī/&/ite/  $\xrightarrow{3,4}$  /mitē/ 'want to see'

/kak/&/ite/&/kute/  $\xrightarrow{4}$  /kakitēkute/  $\xrightarrow{15}$  /kakitēkute/ 'want to write'.

As Rule 16 is a general rule, we cannot add the environment of [-acc] to the second vowel of Rule 16.

The demonstrations of negative past sentences are as follows:



## 3b. Verbal nouns.

To make a verbal noun, we put the suffix /ĩ/ to a consonant-stem verb. When /i/ follows an atonic noun, the preaccent of the atonic noun remains (SC 1):

/ʔok/&/ĩ/ → /ʔoki/'putting'

/ʔhazimar/&/ĩ/ → /ʔhazimari/'beginning'.

When /ĩ/ follows a tonic noun, the accent of the suffix /ĩ/ remains (SC 2):

/kak̃/&/ĩ/ → /kakĩ/'writing'

/modor̃/&/ĩ/ → /modorĩ/'returning'.

## 1. Nouns plus verbal nouns.

A) When verbal nouns are preceded by atonic nouns, the preaccents of the atonic nouns remain (SC 1):

/ʔame/+/ʔuri/ → /ʔameʔuri/'selling a candy'

/ʔsakana/+/ʔturi/ → /ʔsakanaturi/'fishing'

/ʔtakenoko/+/torĩ/ → /ʔtakenokotori/'taking a bamboo'.

B) When verbal nouns are preceded by tonic nouns, the second syllables of verbal nouns have accents:

/ʔẽ/+/kakĩ/ → /ʔekakĩ/'painting'

/ʔẽ/+/ʔurĩ/ → /ʔeʔurĩ/'selling a picture'

/ʔamẽ/+/hurĩ/ → /ʔamehurĩ/'raining'

/simã/+/nagasĩ/ → /simanagasĩ/'exiling to an island'

/tanẽ/+/ʔakasĩ/ → /taneʔakasĩ/'revealing a trick'

/yōru/+/ʔarukĩ/ → /yoruʔarukĩ/'walking at night'

/hōtaru/+/ʔkarĩ/ → /hotarugarĩ/'catching a firefly'

/yōru/+/ʔhazimarĩ/ → /yuruhazimarĩ/'beginning at night'.

The rules of verbal nouns are as follows:

Rule A.  $\sigma \rightarrow \langle 1acc \rangle / \# (\langle 1acc \rangle \dots)_n + (\dots)_{vn} \#$

Rule B.  $\sigma \rightarrow \langle 1acc \rangle / \# (\dots S \langle 1acc \rangle \dots)_n + (S S \langle \_\_ \rangle \dots)_{vn} \#$

## 2. Verbal noun plus present forms of verbs.

When a verbal noun is compounded with a present form of verb, the second syllable from the end has an accent:

/tatĩ/+/yoru/ → /tatiyōru/ 'drop in'

/ʔoki/+/kaeru/ → /ʔokikaēru/ 'replace'

/ʔuri/+/kireru/ → /ʔurikireru/ 'be sold out'

/ʔosi/+/korosu/ → /ʔosikorōsu/ 'kill by pushing'

/tatĩ/+/ʔagaru/ → /tatiʔagaru/ 'stand up'

/torĩ/+/kakaru/ → /torikakaru/ 'begin'

/ʔukẽ/+/tugu/ → /ʔuketugu/ 'succeed to'.

The rule of verbal nouns plus present forms of verbs is as follows:

$\sigma \rightarrow \langle 1acc \rangle / \# (\dots)_{vn} + \dots S \langle \_\_ \rangle (r)u \#$

## 3. Verbal nouns plus verbal nouns.

When two verbal nouns are compounded, an accent is inserted on the syllable boundary before the first syllable of compound:

$\sigma \rightarrow \langle 1acc \rangle / \# (\langle \_\_ \rangle \dots)_{vn} + (\dots)_{vn} \#$

/kamĩ/+/konasi/ → /kamikonasi/ 'chewing'

/katugĩ/+/dasĩ/ → /katugidasi/ 'carrying out'



$/\text{sinobi}/ + / \text{'yori}/ \rightarrow / \text{'sinobiyori}/$  'tiptoeing'  
 $/\text{tori}/ + / \text{'kaesi}/ \rightarrow / \text{'torikaesi}/$  'recovering'  
 $/\text{tukupi}/ + / \text{'na?osi}/ \rightarrow / \text{'tukurina?osi}/$  'remaking'  
 $/ \text{'musebi}/ + / \text{'naki}/ \rightarrow / \text{'musebinaki}/$  'sobbing'  
 $/ \text{'?uri}/ + / \text{'nokori}/ \rightarrow / \text{'?urinokori}/$  'lefting merchandise'  
 $/ \text{'?oki}/ + / \text{'na?osi}/ \rightarrow / \text{'?okina?osi}/$  'replacing'  
 $/ \text{'hiki}/ + / \text{'modosi}/ \rightarrow / \text{'hikimodosi}/$  'bringing back'.

### 3c. Verbs plus particles.

When particles follow verbs, the rules are not always the same as those for nouns plus particles. We see four different accentuations when particles follow verbs.

#### Group A.

When a particle follows an atonic verb stem, the preaccent of the verb stem remains (SC 1):

$/ \text{'?ik}/ + / \text{'i}/ + / \text{'wa}/ \xrightarrow{\text{SC1}} / \text{'?ikiwa}/ \xrightarrow{\text{PA2}} [\text{'?ikiwa}]$  'going (nominative)'  
 $/ \text{'?asob}/ + / \text{'ana}/ + / \text{'ga}/ \xrightarrow{\text{SC1}} / \text{'?asobanaga}/ \xrightarrow{\text{PA2}} [\text{'?asobanaga}]$  'play (order)'.

When a particle follows a tonic verb stem, the accent of the particle remains (P 1):

$/ \text{'kak}/ + / \text{'i}/ + / \text{'wa}/ \xrightarrow{\text{P1}} / \text{'kakiwa}/ \xrightarrow{\text{PA2}} [\text{'kakiwa}]$  'writing (nom)'  
 $/ \text{'hare}/ + / \text{'i}/ + / \text{'nagara}/ \xrightarrow{\text{P1}} / \text{'harenagara}/ \xrightarrow{\text{PA3}} [\text{'harenagara}]$  'becoming clear'.

#### Group B.

When a particle follows the atonic present form of a verb, the preaccent of the verb remains (SC 1):

/ˈnaku/#/ˈga/  $\xrightarrow{SC1}$  /ˈnakuga/  $\xrightarrow{PA2}$  [nakuga] 'cry (question)'  
 /ˈniru/#/ˈbega/  $\xrightarrow{SC1}$  /ˈnirubega/  $\xrightarrow{PA2}$  [nirubega] 'boil  
 (question)'.

When a particle follows the tonic present form of a verb, the accent of the verb remains (SC 4):

/tab̄eru/#/ˈga/  $\xrightarrow{SC4}$  /tab̄eruga/  $\xrightarrow{PA1,3}$  [tab̄eruga]  
 'eat (question)'  
 /yōmu/#/ˈbega/  $\xrightarrow{SC4}$  /yōmubega/  $\xrightarrow{PA1,3}$  [yōmubega]  
 'read (question)'.

### Group C.

When a particle follows the atonic present form of a verb, an accent is inserted on the syllable boundary between the verb and the particle:

P 3 [Rank %]  $\sigma \rightarrow \langle 1acc \rangle / \% (\langle 1acc \rangle \dots) \# (\langle \_ \rangle \dots) \_ t \%$   
 /ˈsinu/#/māde/  $\xrightarrow{P3}$  /sinūmade/  $\xrightarrow{PA1,3}$  [sinūmade] 'until die'  
 /ˈniru/#/ˈyorimo/  $\xrightarrow{P3}$  /nirūyorimo/  $\xrightarrow{PA1,3}$  [nirūyorimo]  
 'rather than boiling'.

When a particle follows the tonic present form of a verb, the accent of the verb remains, and the syllable following the accented syllable also has an accent (P 2):

/k̄eru/#/māde/  $\xrightarrow{P2}$  /k̄erūmade/  $\xrightarrow{PA1}$  [k̄erūmade] 'until kick'  
 /tab̄eru/#/ˈyorimo/  $\xrightarrow{P2}$  /tab̄erūyorimo/  $\xrightarrow{PA1}$  [tab̄erūyorimo]  
 'rather than eating'.

The rules PA 3 and PA 5 do not apply to the compound to which P 2 also applies:

[tab̄erūyorimo]  $\xrightarrow{PA3}$  \*[tab̄erūyorimo] 'rather than eating'  
 [tab̄erūyorimo @ nomite]  $\xrightarrow{PA5}$  \*[tab̄erūyorimonomite]  
 'want to drink rather than eat'.

## Group D.

When a particle follows a verb stem, the accent of the particle remains (SC 2):

/ʔik/&/ehē/  $\xrightarrow{SC2}$  /ʔikehē/  $\xrightarrow{PA4}$  [ʔikehē] 'go (order)'  
 /tabē/&/re/  $\xrightarrow{SC2}$  /tabere/  $\xrightarrow{PA4}$  [taberē] 'eat (order)'.

The particles in Group A, B, C and D are as follows:

## Group A.

/ʔwa/(emphasis), /ʔmo/'also', /nāgara/ (progressive),  
 /rēba/'if', /anāga/(order), /rasēru/(causative), /anē/  
 (negative).

## Group B.

/ʔga/(question), /ʔna/(question), /ʔni/(objective),  
 /ʔdo/(conclusion), /ʔa/'let us', /ʔon/(polite, women's  
 speech), /ʔne/(guess), /ʔga/'either or', /ʔse/(sureness),  
 /ʔna/(negative, question), /ʔyo/(will, guess), /zya/  
 (determination), /ʔbega/(question). Some particles in  
 Group B have more than one meanings. The meaning is  
 determined by the context. Here I gave just one or two  
 of the meanings.

## Group C.

/dāge/'only', /sika/'only', /bāsi/'only', /māde/'until',  
 /ʔyori/'than', /ʔyorimo/'rather than', /ʔhodo/'as',  
 /ʔkedo/'but', /ʔkedomo/'but', /ʔgure/'about', /ʔdogoro/  
 'doing', /ʔbatte/'but', /ʔmonde/'because'.

## Group D.

/ehē/(order), /rē/(order), /rō/(order), /rēzya/(order),

/rōzya/(order).

The accents when particles follow verbs are as follows:

			A
			with /nāgara/
atonic	1 syl.	ʔik 'go'	ʔikinagārā
	2 syl.	ʔasob 'play'	ʔasobinagārā
Tonic	1 syl.	kak' 'write'	kakinagāra
	2 syl.	hare' 'become clear'	harenagāra

A	B		C
with /anē/	with /ŋga/	with /ŋbega/	with /māde/
ʔikanē	ʔikugā	ʔikubegā	ʔikumade
ʔasobanē	ʔasobugā	ʔasobubegā	ʔasobumade
kakanē	kakuga	kakubega	kakumade
harene	hareruga	harerubega	harerumade

C	D	
with /kedomo/	with /ehē/	with /rēzya/
ʔikukedomo	ʔikehē	ʔikezya
ʔasobukedomo	ʔasobehe	ʔasobezya
kakukedomo	akehe	akezya
harerukedomo	harehe	harerezya

## 3d. Verbs plus auxiliary verbs.

We can divide auxiliary verbs into four groups according to the accentuations of compounds.

## Group A.

When an auxiliary verb follows a verb, the accent of the verb remains (SC 4):

/ʔik/ & /ite/  $\xrightarrow{SC4}$  /ʔitte/  $\xrightarrow{PA2}$  [ʔitte] 'going'  
 /hanas/ & /itemo/  $\xrightarrow{SC4}$  /hanasitemo/  $\xrightarrow{PA1}$  [hanasitemo]  $\xrightarrow{PA3}$   
 [hanasitemo] 'even if talking'.

## Group B.

When an auxiliary verb follows an atonic verb, the accent of the auxiliary verb remains (SC 3):

/ʔasob/ & /ʔenta/  $\xrightarrow{SC3}$  /ʔasobuʔenta/  $\xrightarrow{PA1,3}$  [ʔasobuʔenta]  
 '(it) seems (one) plays'  
 /niru/ & /ndabe/  $\xrightarrow{SC3}$  /nirundabe/  $\xrightarrow{PA1,3}$  [nirundabe]  
 'boil (question)'.

When an auxiliary verb follows a tonic verb, the accent of the verb remains, and the syllable following the accented syllable also has an accent (P 2). The rules which apply to the compounds of 3c, Group C, apply to the compounds in this group. P 2 also applies to the compounds of verbs plus auxiliary verbs:

/keru/ & /ʔenta/  $\xrightarrow{P2}$  /keruʔenta/  $\xrightarrow{PA1}$  [keruʔenta]  
 '(it) seems (one) kicks'  
 /taberu/ & /ndabe/  $\xrightarrow{P2}$  /taberundabe/  $\xrightarrow{PA1}$  [taberundabe]<sup>15</sup>  
 'you eat, don't you?'.

## Group C.

When an auxiliary verb follows an atonic verb, the

preaccent of the verb remains (SC 1):

/ʌnak/ & /as̄eru/  $\xrightarrow{SC1}$  /ʌnakaseru/  $\xrightarrow{PA2}$  [nakaseru] 'let one cry'

/ʌʔasob/ & /ane/  $\xrightarrow{SC1}$  /ʌʔasobane/  $\xrightarrow{PA2}$  [ʔasobane] 'do not play'.

When an auxiliary verb follows a tonic verb, the accent of the auxiliary verb remains (P 1). P 1 also applies to the compounds of verbs plus auxiliary verbs:

/kak/ & /ras̄eru/  $\xrightarrow{P1}$  /kakaseru/  $\xrightarrow{PA1}$  [kakaseru] 'let one write'  
/tabe/ & /ane/  $\xrightarrow{P1}$  /tabene/  $\xrightarrow{PA4}$  [tabene] 'do not eat'.

Group D.

When an auxiliary verb follows a verb, the accent of the auxiliary verb remains (AV 1):

/ʌʔasob/ & /isu/  $\xrightarrow{AV1}$  /ʔasobisu/  $\xrightarrow{PA1}$  [ʔasobisu] 'play'  
/hare/ & /isu/  $\xrightarrow{AV1}$  /har̄esu/  $\xrightarrow{PA1}$  [har̄esu] 'become clear'  
/kak/ & /isu/ & /ita/  $\xrightarrow{AV1}$  /kak̄isuta/  $\xrightarrow{PA1,3}$  [kak̄isuta] 'wrote'.

The auxiliary verbs in Group A, B, C and D are as follows:

Group A.

/rube/ 'probably', /ita/ (past), /ite/ (gerund), /itari/ 'or (past)', /itemo/ (gerund with /mo/ 'also, even'.

Group B.

/ʌʔenta/ 'seem', /ʌndabe/ (question).

Group C.

/ras̄eru/ (causative), /rar̄eru/ (passive), /ane/ (negative), /anebe/ (negative question), /isoōda/ 'seem', /ite/ 'want', /anesooda/ (negative).

Group D.

/ĩsu/ (polite).

The accents when auxiliary verbs follow verbs are as follows:

			A	
			with /ite/	with /rube/
atonic	1 syl.	ʔik	ʔitte	ʔikube
	2 syl.	ʔasob	ʔasonde	ʔasobube
tonic	1 syl.	kakʔ	kaite	kakube
	2 syl.	hareʔ	harete	harerube

B		C
with /ʔenta/	with /ndabe/	with /raseru/
ʔikuʔenta	ʔikundabe	ʔikaseru
ʔasobuʔenta	ʔasobundabe	ʔasobaseru
kakuʔenta	kakundabe	kakasaru
hareruʔenta	harerundabe	harerasaru

C	D
with /ane/	with /ĩsu/
ʔikane	ʔikisu
ʔasobane	ʔasobisu
kakane	kakisu
harene	haresu

#### 4. Adjectives.

##### 4a. Indicative forms.

Adjective stems have two types of accent, atonic and final accented (tonic) patterns.

Atonic: /ʔama/'sweet', /ʔasa/'shallow', etc.

Final accented: /hutõ/'fat , thick', /sirõ/'white', etc.

The indicative form of an adjective is made by adding the suffix /i/ to a stem. When /i/ is added, /i/ changes to /e/ in the following environment.

$$\text{Rule 1 } [\text{Rank } \#] \quad i \rightarrow e / \left\{ \begin{array}{c} \# \text{ ? } \text{---} \\ \left\{ \begin{array}{c} e \\ a \\ [-\text{velar}] \text{ o} \end{array} \right\} \text{---} \# \end{array} \right\}$$

/ʔaka/&/i/ → /ʔakae/'red'

/yowã/&/i/ → /yowae/'weak'

/ʔoso/ &/i/ → /ʔosoe/'late'

/ʔĩ/&/i/ → /ʔei/'good'.

/i/ is an unaccented morpheme. Therefore, when it follows another morpheme, the accent of the first morpheme remains.

The stem /ʔaka/ has two accents, a preaccent and a final accent: /ʔakã/. When it is followed by particles or it occurs in isolation, the accent on /ka/ remains. When it is followed by other morphemes within a word boundary, its preaccent remains:

/ʔakã/&/ku/ → /ʔakaku/'red-like'.

But



/ʔaka/#d̄age/ → /ʔakad̄age/ 'only red (noun)'

/ʔaka/#ʔga/ → /ʔakāga/ 'red (noun, nominative)'.

When /ʔaka/ is used as a noun, the accent on /ka/ remains. Otherwise, the preaccent remains; that is, when /ʔaka/ is followed by a internal word boundary or higher, the accent on /ka/ remains, and when it is followed by [&], the preaccent remains. Thus, /ʔaka/ has two accents in the grammatical point of view.

When /i/ follows a stem of which the final syllable is /Cu/, the /u/ becomes /i/ if the /C/ is not [+velar].

Rule 2 [Rank #]  $u \rightarrow i / [-\text{velar}] \_ \& i \#$

/samū̄/&i/ → /samīi/ 'cold'

/kayū̄/&i/ → /kayīi/ 'itchy'

/ʔusu/&i/ → /ʔusii/ 'thin'.

If the initial or final vowel /e/ follows or precedes other vowels, the vowels are assimilated to /e/.

Rule 3 [Rank #]  $V \rightarrow e / \left\{ \begin{array}{l} \_ e \# \\ \# ? e \_ \end{array} \right\}$

/yowāe/ → /yowēe/ 'weak', /ʔosoe/ → /ʔosee/ 'late'

/ʔēi/ → /ʔēe/ 'good', /ʔhiroe/ → /ʔhīree/ 'wide'

/sirōe/ → /sirēe/ 'white'.

The final vowel of a word is deleted if the vowel is preceded by the same vowel. That is, the second vowel of long vowel is deleted before a word boundary.

Rule 4 [Rank #]  $V_1 \rightarrow \emptyset / V_1 \_ \#$

/samīi/ → /samī/ 'cold', /kayīi/ → /kayī/ 'itchy'

/yowēē/ → /yowē/ 'weak', /ʔēē/ → /ʔē/ 'good',  
 /ʰhiree/ → /ʰhire/ 'wide'.

Rule 4 is a general rule which deletes a vowel before a word boundary:

/senseē/ → /sense/ 'a teacher', /kyoo/ → /kyō/ 'today'.

This shortening rule is different from that of a non-final syllable. When a syllable is not at the end of a word, the second vowel of long double vowel is not completely deleted. Suppose each mora has the same length, /ʔooʔi/, /taazan/, /toohoo/, /gyuunyuu/, etc.

By rule 4, the final vowel of a long double vowel is deleted. But the second /o/ of /ʔooʔi/ is not deleted and a half length of the vowel remains:

/ʔooʔi/ → /ʔo.ʔi/, /taazan/ → /ta.zan/, /toohoo/ → /to.ho/, /gyuunyuu/ → /gyu.nyu/.

Although the final /u/ in /gyuunyuu/ is deleted, if we add /ya/ or other morphemes after it, it is not deleted:

/gyuunyuu/+ya/ → /gyu.nyu.ya/.

The indicative forms of adjectives always delete the last vowels of double vowels:

/ʔookii/ → /ʔo.ki/, /ʔookii/#/ʰhako/ → /ʔo.kihako/,  
 /ʔookii/#/ʰbe/ → /ʔo.kibe/.

/CV̄/ is a syllable and its length is the same as the syllable /CVC/, but the length is longer than the syllable /CV/.

If the final syllable of a stem is /ko/, /go/, /po/, /ku/ or /o/ followed by a vowel, /ʔ/ is automatically inserted between the final vowel of the stem and the suffix /i/.

Rule 5 [Rank #]  $\emptyset \rightarrow \text{ʔ} / \left\{ \begin{smallmatrix} \text{V} \\ [+grave] \end{smallmatrix} \right\} \text{V} - \left[ \begin{smallmatrix} \text{V} \\ +high \end{smallmatrix} \right] \#$

/kō̄/&/i/  $\rightarrow$  /kō̄ʔi/ 'thick'

/kasikō̄/&/i/  $\rightarrow$  /kasikō̄ʔi/ 'cleaver'

/megō̄/&/i/  $\rightarrow$  /megō̄ʔi/ 'cute'

/ʔoō̄/&/i/  $\rightarrow$  /ʔoō̄ʔi/ 'many'

/ʔakippō̄/&/i/  $\rightarrow$  /ʔakippō̄ʔi/ 'changeable'

/ʰhokorippo/&/i/  $\rightarrow$  /ʰhokorippoʔi/ 'dusty'

/nikū̄/&/i/  $\rightarrow$  /nikū̄ʔi/ 'hateful'

/hikū̄/&/i/  $\rightarrow$  /hikū̄ʔi/ 'low'.

There is an exception:

/sugō̄/&/i/  $\xrightarrow{1}$  /sugō̄e/  $\xrightarrow{3}$  /sugē̄e/  $\xrightarrow{4}$  /sugē̄/ 'great'.

#### 4b. Adjectives plus particles.

We can classify the compounds of adjectives plus particles into two groups.

##### Group A.

When a particle follows the atonic stem or the atonic indicative form of an adjective, the preaccent of the adjective remains (SC 1):

/ʰʔasa/&/i/  $\xrightarrow{\text{SC1}}$  /ʰʔase/  $\xrightarrow{\text{PA2}}$  [ʰase] 'shallow'

/ʰʔomota/&/kute/  $\xrightarrow{\text{SC1}}$  /ʰʔomotakute/  $\xrightarrow{\text{PA2}}$  [ʰomotakute] 'heavy'

/ʰʔomote/#/be/  $\xrightarrow{\text{SC1}}$  /ʰʔomotebe/  $\xrightarrow{\text{PA2}}$  [ʰomotebe] 'heavy  
(question)'.



$\text{/?a?o?i/\#/?kedo/} \xrightarrow{P2} \text{/?a?o?ikedo/} \xrightarrow{PA1} [\text{?a?o?ikedo}]$   
 'although (it is) blue'  
 $\text{/medetē/\#/?yorimo/} \xrightarrow{P2} \text{/medetēyorimo/} \xrightarrow{PA1} [\text{medetēyorimo}]$   
 'rather than happy'.

The particles in Group A and B are as follows:

Group A.

/i/, /ku/, /kute/, /kumo/, /kane/(negative), /ba/'if',  
 /be/(question), /si/'be', /ka/(question), /to/'be said',  
 /ga/(question).

Group B.

/noni/'although', /kedo/'although', /kedomo/'although',  
 /yori/'than', /yorimo/'rather than', /hodo/'more',  
 /gure/'about', /nari/'or', /hade/'because', /gara/  
 'because'.

The accents when particles follow adjectives are as follows:

		A	
		with /i/	with /kute/
atonic	ʼ?asa 'shallow'	?asē	?asakutē
	ʼ?omota 'heavy'	?omotē	?omotakutē
	ʼyasuppo 'cheap'	yasuppo?i	yasuppokutē
tonic	?i 'good'	?e	?ekute
	?a?o 'blue'	?a?o?i	?a?okute
	medeta 'happy'	medetē	medetakute



## Group B.

Unlike the Tookyoo dialect, by adding /datta/ or /katta/ to the adjective stem, I cannot make an adjectival verb in the Hirosaki dialect. In the Hirosaki dialect, by adding /ʔatta/ (<ʔaʔita) or /ʔarisuta/ (<ʔaʔisita), we make an adjectival verb. /ʔatta/ and /ʔarisuta/ always follow a particle /kute/. As there is a minor phrase boundary between /kute/ and /ʔatta/, /ʔarisuta/, SC, P, AV rules do not apply to crossing over @, and PA 5 applies to the compound:

[ʔomotekute@atta] 'was heavy'

[ʔaʔokute@ʔarisuta] → [ʔaʔokuteʔarisuta] 'was blue'.

## 4d. Adjectives plus nouns.

When an adjective is followed by a noun, the PA rules apply to the adjective and the noun individually. There is a minor phrase boundary between an adjective and a noun.

/ʔake/ % /ʔti/  
 ↓ PA2      ↓ PA2  
 [ʔake      ʔti]  
 'red blood'

/ʔokkane/ % /ʔtokage/  
 ↓ PA2      ↓ PA2  
 [ʔokkane      tokage]  
 'fearful lizard'

/ʔakari/ % /ʔasa/  
 ↓ PA2      ↓ PA4  
 [ʔakari      ʔasa]  
 'bright morning'

/ʔnemute/ % /ʔaki/  
 ↓ PA2      ↓ PA1  
 [nemute      ʔaki]  
 'sleepy autumn'

/take/ % /ʔtukuʔe/  
 ↓ PA1      ↓ PA2  
 [take      tukuʔe]  
 'high desk'

/ʔe/ % /ʔe/  
 ↓ PA1      ↓ PA4  
 [ʔe      ʔe]  
 'good picture'

/megōʔi/ % /ʌsakana/	/megōʔi/ % /sūzume/
↓ PA1,5      ↓ PA2	↓ PA1,5      ↓ PA1,3
[megōʔi      sakana]	[megōʔi      suzume]
'cute fish'	'cute sparrow'.

In rapid speech, when an atonic adjective is followed by a noun, a noun plus a particle, or a noun plus an auxiliary verb, the syllables between high pitches also become high-pitched:

[tumetēkaze] → [tumetēkaze] 'cold wind'

[ʔokkanētōkage] → [ʔokkanētōkage] 'fearful lizard'

[marīʔatama] → [marīʔatama] 'round head'

[ʔabunēʔinotiga] → [ʔabunēʔinotiga] 'dangerous life  
(nominative)'

[ʔokkanētōkageda] → [ʔokkanētōkageda] 'is a fearful lizard'.

When a tonic adjective is followed by a noun, the syllables between high pitches do not become high-pitched in rapid speech:

[hayēsakana] → \*[hayēsakana] 'fast fish'

[ʔekatana] → \*[ʔekatana] 'good sword'.

In a compound in which a tonic adjective is followed by a noun, a noun plus a particle, or a noun plus an auxiliary verb, if the adjective is emphasized, the accent of the noun, the particle or the auxiliary verb is deaccented:

/ʔatī/%/ʌsake/ → [ʔatīsake] 'hot sake'

/nage/%/ʔasi/ → [nageʔasi] 'long legs'

/take/%/kōʔega/ → [takekoʔega] 'loud voice (nominative)'



/syakkōʔi/%/ʔkaradademo/ → [syakkōʔikaradademo]  
 'even a cold body'

/ʔaʔōʔi/%/mekāra/ (< mēʔ#kāra) → [ʔaʔōʔimekara]  
 'from blue eyes'.

The accent of a noun is not deaccented in the compound emphasizing an adjective if the adjective is atonic:

/ʔakari/%/ʔhi/ → [ʔakarīhi] , \*[ʔakarīhi] 'clear day'

/ʔutukusi/%/hanā/ → [ʔutukusihana], \*[ʔutukusihana]  
 'beautiful flower'

/ʔme/%/ʔitigo/ → [mēʔitigo] , \*[mēʔitigo]  
 'delicious strawberry'.

## Footnotes

<sup>1</sup> I do not distinguish between a glottal stricture and a glottal stop in a phonetic level. [ʔ] should be changed to a glottal stricture in a phonetic level if it does not occur at the beginning of utterance, that is, if it does not occur after a pause.

<sup>2</sup> Haruhiko Kindaichi (1968:313) uses the term "taki". Suppose 0 means an unaccented syllable and ● means an accented syllable, instead of writing ●0 (like the word /ʔame/'rain'), he uses a taki. ●0 = 0̄0, 0● = 00̄. In this paper, I am using the notion of Kindaichi's taki, and there are other scholars who use the different notions for the fall and raise of pitch. Kindaichi argues that to use only taki is enough and more precise.

For the Hirosaki dialect, I use a taki in the Phonemic level and put one taki for most morphemes. Some morphemes do not have takis and some morphemes have more than one takis in the underlying forms. There is a taki either between syllables, or after the final syllable, or before the initial syllable, 0̄0 or 00̄ or ʔ00, respectively. A taki indicates a pitch dropping after a syllable, but it is not always so on the surface form as I discuss later. I use a taki in the phonemic level to indicate the position of accent and use a straight line over a syllable in the phonetic level to indicate a high pitch: /0̄0/ → [0̄0].

<sup>3</sup> These terms, "initial accented pattern", "middle accented pattern" and "final accented pattern", correspond to the Japanese notions "atamadaka gata", "nakadaka gata" and "odaka gata", respectively.

<sup>4</sup> In Japanese notions, it is called "heiban gata".

Samuel Martin (1967:247) uses the term "atonic" and writes as follows:

"..., atonic, having no significant fall of pitch within it (word)".

5 Here I chose /ga/ as the particle. Even if I chose a particle /no/, there is no change of the place of accent in the Hirosaki dialect:

/hanã/#/no/'of' → /hanano/'of a flower'.

But in the Tookyoo dialect, the particle /no/ is not very reliable for testing because it is fairly irregular. For example:

/ʌhana/'a nose'#/no/ → [hanāno]'of a nose'

/hanã/'a flower'#/no/ → [hanāno]'of a flower'.

In the Hirosaki dialect, /ʌhana/#/no/ → [hanāno]'of a nose'.

In both the Tookyoo and Hirosaki dialects, /hana/ 'a flower' is a "final accented" word, /hanāga/. There is no-rule in the Tookyoo dialect that, when the particle /no/ is preceded by a "final accented" word, the phrase becomes "atonic". James McCawley presents the no-rule (1968:181).

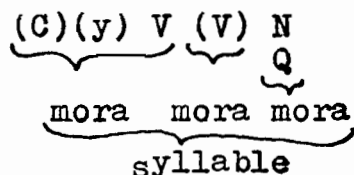
6 Konoshima (1961) uses the accent mark [ō] which indicates that a high pitch falls to a low one within a syllable. Kindaichi (1968:203) explains it by dividing a mora into a phoneme. He discusses it with the example of /ʔame/'rain' in the Kyooto dialect. The /me/ of /ame/ consists of two phonemes, /m/ and /e/; /m/ has an accent but not whole /me/. /ʔame/ is accented as 00. That is, /me/, 0 is considered as the combination of 0 and 0.

The pitch of /me/ falls from high to low is the same as the Hirosaki dialect, but there is not the 0 type accent in the underlying forms in the Kyooto and Hirosaki dialects. In the Kyooto and Hirosaki dialects, /ʔame/, in isolation, is pronounced as 00, but when /ʔame/ is followed by other morphemes, for instance, /ga/, it is pronounced as 000. This means that the underlying accent of /ʔame/ is 00 or 00̄, not 00 or 00̄, and 0 or 0̄ is pronounced as 0, 0̄, or 0̄̄.

on the surface form if the syllable is not followed by another morpheme. That is, \*[hanaya] or \*[?ehude] never exists in the Hirosaki dialect. The dialect which has the ① type in the underlying form shows the accent of /ame/ plus /ga/ as 000, such as the Takamatsu dialect (the Kyooto-Oosaka type).

There is another solution on which to establish the underlying form as ① in the Hirosaki dialect, and when ① is followed by another morpheme, ① becomes ② on the surface form.

7 A mora consists of either  $V_1$ , CV, CyV, N(mora nasals),  $V_2$ (after vowel, vowel gemination) or Q(mora obstruent). The last three are called bound moras, which can have no kind of meaning. A syllable consists of either one, two or three moras.



Thus, /kingyo/'gold fish', /seeya/'holy night', /kitto/'surely' consist of three moras and two syllables for each, /tensuu/'score', /bannin/'a guard', /hakken/'discovery', /kyoodai/'a brother' consist of four moras and two syllables for each.

8 McCawley (1968:180) explains the syllable boundary as follows: "... the proper bearer of abstract accent marks is not the syllable but rather the syllable boundary. ...; in cases where the position for accent insertion turns out to be in the middle of a syllable, the accent is to go on the syllable boundary at the end of that syllable".

McCawley is here talking about the abstract accent, and not the surface form. Thus, in /kan/'a can', the accent is in the middle of a syllable, but the abstract accent will be indicated as /kan̩/, which is on the syllable

boundary. I put the accent on the syllable boundary in the abstract sense and the accent becomes high-pitched over the syllable on the surface form:

/ōō/ → [ōō], /ōōō/ → [ōōō].

9 Following McCawley (1968), the term rank of a rule indicates the juncture defining the stretches on which the rule operates and, as I mentioned before, the juncture forms a hierarchy under which any occurrence of a juncture also counts as an occurrence of all "weaker" junctures. That is, if a rank is [%], the rule operates on the juncture [%], [#], [+] or [&]. The examples of PA2 are as follows:

#/'sakura/+/ 'moti/# → /'sakuramoti/ → [sakuramoti]  
'sakuramochi' (a kind of rice cake)  
%/'sakuramoti/#/'ga/% → /'sakuramotiga/ → [sakuramotiga]  
'sakuramochi (nominative)'

The rank means that the rule cannot operate over the juncture in rank or over a higher juncture than it. That is, PA2 does not apply to the following sentence:  
/'sakuramotiga/@/?aru/ → \*[sakuramotiga?aru], but  
[sakuramotiga]@[?aru] → [sakuramotiga?aru  
'There is sakuramochi'

10 /hoomon'kyaku/, /gensīryoku/ and /sensuikan/ consist of two nouns for each:

/'hoomon/+/ 'kyaku/ → /hoomon'kyaku/  
/gen'si/+/ 'ryoku/ → /gensīryoku/  
/'sensui/+/ 'kan/ → /sensuikan/.

The preaccents of the second nouns remain in these compounds which I will discuss later (Other rules for compounds, P. 18).

11 I assume /bōkusi/ and /sīryoku/ are the underlying forms which are the surface forms in the Tookyoo dialect.

12 P1 and P2 apply not only to compounds with particles but also to compounds with auxiliary verbs.

<sup>13</sup> I follow Hirayama's classifications (1969) of auxiliary verbs (zyodooshi).

<sup>14</sup> /w/ is /p/ in the underlying form. McCawley (1968) represents the phonological rules by which /p/ becomes /w/ (Rules 9, 10 and 30). In this paper I start from /w/ ignoring its sound change.

<sup>15</sup> CVCCV becomes CVCCV. In formal speech, some people pronounce /no/ without dropping /o/. Then, /no/ does not have a high pitch on the syllable.  
 /tabe<sup>1</sup>ru/#/<sup>1</sup>nodabe/  $\xrightarrow{P2}$  /tabe<sup>1</sup>ru<sup>1</sup>nodabe/  $\xrightarrow{PA1}$  [tabe<sup>1</sup>ru<sup>1</sup>nodabe].

## Appendix

The demonstrations by using the rules for compound nouns.

## A. Native nouns.

## a) CN A and PA 2.

CN A  $\sigma \rightarrow \langle 1acc \rangle / \# \langle 1acc \rangle \dots + (\dots) \#$   
nat.n

PA 2 [ ]  $\rightarrow$  [high pitch] / %  $\langle 1acc \rangle \dots \dots \dots$  %

/ko/+/?inu/<sup>CNA</sup> /ko?inu/<sup>PA2</sup> [ko?inu] 'a small dog'

/ko/+/yagi/<sup>CNA</sup> /koyagi/<sup>PA2</sup> [koyagi] 'a small cow'

/i/+/?ibukuro/<sup>CNA</sup> /?ibukuro/<sup>PA2</sup> [?ibukuro] 'stomach'

/ame/+/?amedama/<sup>CNA</sup> /?amedama/<sup>PA2</sup> [?amedama] 'taffy'

/take/+/?hāsi/<sup>CNA</sup> /takebasi/<sup>PA2</sup> [takebasi] 'bamboo chopsticks'

/tikara/+/?tamesi/<sup>CNA</sup> /tikaradamesi/<sup>PA2</sup> [tikaradamesi] 'testing one's power'

/sakura/+/?moti/<sup>CNA</sup> /sakuramoti/<sup>PA2</sup> [sakuramoti] 'rice cake with a cherry leaf'

/takenoko/+/?yamā/<sup>CNA</sup> /takenokoyama/<sup>PA2</sup> [takenokoyama] 'a bamboo mountain'

/niwatori/+/?koyā/<sup>CNA</sup> /niwatorigoya/<sup>PA2</sup> [niwatorigoya] 'a chicken house'

/onsen/+/?miyāge/<sup>CNA</sup> /onsenmiyage/<sup>PA2</sup> [onsenmiyage] 'a souvenir of a spa'

/yuubin/+/?hako/<sup>CNA</sup> /yuubinbako/<sup>PA2</sup> [yuubinbako] 'a mail box'

## b) CN B, PA 1 and PA 3.

CN B  $\sigma \rightarrow \langle 1acc \rangle / \# \dots \dots \dots + (\dots S \langle 1acc \rangle S \dots) \#$   
nat.n

PA 1 [ ]  $\rightarrow$  [high pitch] /  $\dots \dots \dots \langle 1acc \rangle \dots \dots S$

PA 3 [ ]  $\rightarrow$  [high pitch] / @  $\dots \dots$  [high pitch] ( — )<sup>n</sup> S @

/me/+/?kusuri/<sup>CNB</sup> /megusuri/<sup>PA1</sup> [megusuri] 'eye lotion'

/wata/+/?tebukuro/<sup>CNB</sup> /watatebukuro/<sup>PA1</sup> [watatebukuro] 'cotton glove'

/budo/+/?hatake/<sup>CNB</sup> /budoobatake/<sup>PA1</sup> [budoobatake] 'a vineyard'

/heike/+ /monogatari/ <sup>CNB</sup> /heikemonogatari/ <sup>PA1</sup> [heikemono-  
gatarì] 'the story of Heike'

/kuro/+ /kigutu/ <sup>CNB</sup> /kurokigutu/ <sup>PA1</sup> [kurokigutu]  
'black wooden shoes'

/daizin/+ /montuki/ <sup>CNB</sup> /daizinmontuki/ <sup>PA1</sup> [daizinmontuki]  
<sup>PA1</sup> [daizinmontuki] 'the minister's garment with the  
family crest'

/tanuki/+ /?oyazi/ <sup>CNB</sup> /tanuki?oyazi/ <sup>PA1</sup> [tanuki?oyazi]  
'a foxy old man'

c) CN C and PA 4.

CN C  $\sigma \rightarrow \langle 1acc \rangle / \# \dots SS \langle 1acc \rangle + (\dots \left[ \begin{smallmatrix} +low \\ V \end{smallmatrix} \right] \langle 1acc \rangle) \#$   
nat.n

PA 4  $\langle 1acc \rangle \rightarrow [\text{high-falling}] / \$ \dots \dots \dots \$$

/yu/+ /hana/ <sup>CNC</sup> /yubana/ <sup>PA4</sup> [yubana] 'the flower in a bath'

/kikai/+ /koya/ <sup>CNC</sup> /kikaigoya/ <sup>PA4</sup> [kikaigoya]  
'a shed with machine in it'

/yane/+ /?ura/ <sup>CNC</sup> /yane?ura/ <sup>PA4</sup> [yane?ura] 'an attic'

/sagyoo/+ /heya/ <sup>CNC</sup> /sagyooheya/ <sup>PA4</sup> [sagyooheya]  
'working room'

/?oya/+ /baka/ <sup>CNC</sup> /?oyabaka/ <sup>PA4</sup> [?oyabaka] 'an overindul-  
gent parent'

/minami/+ /sima/ <sup>CNC</sup> /minamizima/ <sup>PA4</sup> [minamizima]  
'a south island'

/?ame/+ /sora/ <sup>CNC</sup> /?amezora/ <sup>PA4</sup> [?amezora] 'a rainy sky'

/kawa/+ /makura/ <sup>CNC</sup> /kawamakura/ <sup>PA4</sup> [kawamakura]  
'a leather pillow'

/hana/+ /kasa/ <sup>CNC</sup> /hanagasa/ <sup>PA4</sup> [hanagasa] 'a painted  
paper parasol'

/sumi/+ /koya/ <sup>CNC</sup> /sumigoya/ <sup>PA4</sup> [sumigoya] 'a charcoal  
burning shed'

/?otoko/+ /namida/ <sup>CNC</sup> /?otokonamida/ <sup>PA4</sup> [?otokonamida]  
'men's tear'

d) CN D, (free variation PA 0,) and PA 1 and PA 3.

CN D  $\sigma \rightarrow \langle 1acc \rangle / \# \dots + (\dots \text{---} S) \#$   
nat.n

PA 0  $+ (\dots SC \left[ \begin{smallmatrix} +high \\ V \end{smallmatrix} \right] S) \# \rightarrow + \dots S \langle 1acc \rangle S \ S \ \#$   
nat.n

/?e/+ /?hude/ <sup>CND</sup> /?ehude/ <sup>PA1</sup> [?ehude] 'a painting brush'

/te/+ /?asi/ <sup>CND</sup> /te?asi/ <sup>PA1</sup> [te?asi] 'a hand and a leg'



/tē/+ /hukurō/CND → /tebukūro/PA1 [tebukūro] 'a glove'  
 ↗ /tebukuro/PA1.3 [tebukuro]  
 /hī/+ /hasirā/CND → /hibasira/PA1 [hibasira] 'a pillar of fire'  
 ↗ /hibāsire/PA1.3 [hibasira]  
 /konā/+ /yuki/CND → /konayūki/PA1 [konayūki] 'powdery snow'  
 /īrō/+ /kami/CND → /īrogami/PA1 [īrogami] 'colored paper'  
 /oya/+ /yubi/CND → /oyayūbi/PA1 [oyayūbi] 'a thumb'  
 /kata/+ /kuruma/CND → /kataguruma/PA1 [kataguruma]  
 ↗ /kataguruma/ PA1.3  
 [kataguruma] 'piggy-back'  
 /yamā/+ /arasi/CND → /yamaarasi/PA1 [yamaarasi]  
 'mountain storm'  
 /mugi/+ /mesi/CND → /mugimesi/PA1 [mugimesi] 'boiled rice  
 with barley'  
 /hāru/+ /ame/CND → /harusame/PA1 [harusame] 'spring rain'  
 /mātu/+ /kasa/CND → /matukasā/PA1 [matukasā] 'a pine cone'  
 /kinu/+ /ito/CND → /kinu?ito/PA1 [kinu?ito] 'silk thread'  
 /hāru/+ /yamā/CND → /haruyama/PA1 [haruyama] 'spring mountain'  
 /mātu/+ /hayasi/CND → /matubayasi/PA1 [matubayasi]  
 'a pine wood'.  
 /hāri/+ /sigoto/CND → /harisigoto/PA1 [harisigoto]  
 'needlework'  
 /hāru/+ /itigo/CND → /haru?itigo/PA1 [haru?itigo]  
 ↗ /haru?itigo/PA1.3  
 [haru?itigo] 'spring strawberry'  
 /atamā/+ /kāzu/CND → /atamakazu/PA1 [atanakazu]  
 'the number of people'  
 /tanuki/+ /baba/CND → /tanukibaba/PA1 [tanukibaba]  
 'a foxy old woman'  
 /hotaru/+ /hikari/CND → /hotarubikari/PA1 [hotarubikari]  
 'the glow of a firefly'  
 /kuzira/+ /niku/CND → /kuziraniku/PA1 [kuziraniku]  
 'meat of a whale'  
 /aomori/+ /musume/CND → /aomorimusume/  
 PA1 [aomorimusume] 'an Aomori girl'  
 ↗ /aomorimusume/ PA1.3 [aomorimusume]  
 /hanagata/+ /kabu/CND → /hanagatakabu/PA1 [hanagatakabu]  
 'a favourite'

/sūzume/+/'hako/CND /suzumebāko/PA1 [suzumebāko]  
 'a box for a swallow'  
 /huro/+/'mizu/CND /huromizu/PA1 [huromizu] 'bath water'  
 /kābuto/+/'musi/CND /kabutomusi/PA1 [kabutomusi] 'a beetle'

# B. Sino-Japanese.

a) CN 1, AR A, PA 1, PA 3 or PA 4.

CN 1  $\sigma \rightarrow \langle 1acc \rangle / \# \dots + (\dots \langle 1acc \rangle \dots)_{S-J} \#$

AR A  $\% (C(y)V \langle 1acc \rangle S \dots)_{S-J} \rightarrow \% SS \langle 1acc \rangle \dots$

if the accented syllable is not followed  
 by one short syllable.

/kikai/+/'koya/CN1 /kikaigoya/PA4 [kikaigoya] 'a shed with  
 a machine'

/'kentiku/+/'sāgyoo/CN1 /kentikusāgyoo/ARA /kentikusagyoo/  
 PA4 [kentikusagyoo] 'a building work'

/denki/+/'ryoōkin/CN1 /denkiryoōkin/PA1 [denkiryoōkin]  
 'electric rates'

/denki/+/'hatudoōki/CN1 /denkihatudoōki/PA1 [denkihatudoōki]  
 'an electric motor'

/'senpaku/+/'museñkyoku/CN1 /senpakumuseñkyoku/PA1,3  
 [senpakumuseñkyoku] 'a ship's radio station'

/'hatu/+/'hoomonkyaku/CN1 /hatuhoomonkyaku/PA1,3  
 [hatuhoomonkyaku] 'the first visitor'

/matukawa/+/'ziken/CN1 /matukawaziken/ARA /matukawaziken/  
 PA4 [matukawaziken] 'the Matsukawa affair'

/'gentai/+/'siryoku/CN1 /gentaisiryoku/ARA /gentaisiryoku/  
 PA1 [gentaisiryoku] 'decreasing of eye sight'

b) CN 2, AR A, PA 1, PA 3 or PA 4.

CN 2  $\sigma \rightarrow \langle 1acc \rangle / \# \dots + (S \text{ — } \dots)_{S-J} \#$

/'kanzei/+/'kaitei/CN2 /kanzeikaitei/PA1 [kanzeikaitei]  
 'tariff revision'

/'ziyuu/+/'sekai/CN2 /ziyuusekai/ARA /ziyuusekai/PA4  
 [ziyuusekai] 'free world'

/<sup>h</sup>kootoo/+/<sup>g</sup>akkoo/<sup>CN2</sup> /kootoog<sup>g</sup>akkoo/<sup>PA1</sup> [kootoog<sup>g</sup>akkoo]  
 'high school'  
 /<sup>g</sup>anmen/+/<sup>t</sup>oku<sup>?</sup>i/<sup>CN2</sup> /ganment<sup>o</sup>ku<sup>?</sup>i/<sup>ARA</sup> /ganmentoku<sup>?</sup>i/<sup>PA1</sup> [ganmentoku<sup>?</sup>i] 'a triumphant look'  
 /<sup>s</sup>izen/+/<sup>s</sup>yakai/<sup>CN2</sup> /sizensy<sup>g</sup>akai/<sup>ARA</sup> /sizensyakai/<sup>PA4</sup>  
 [sizensyakai] 'the natural society'  
 /<sup>h</sup>iss<sup>i</sup>/+/<sup>b</sup>oosen/<sup>CN2</sup> /hissibo<sup>o</sup>sen/<sup>PA1</sup> [hissiboosen]  
 'desperate defence'  
 /<sup>h</sup>akuti/+/<sup>b</sup>izin/<sup>CN2</sup> /hakutibi<sup>z</sup>in/<sup>ARA</sup> /hakutibizin/<sup>PA4</sup>  
 [hakutibizin] 'a beautiful idiot'  
 /<sup>b</sup>etu/+/<sup>m</sup>ondai/<sup>CN2</sup> /betum<sup>o</sup>ndai/<sup>PA1</sup> [betum<sup>o</sup>ndai]  
 'different problem'

C. The compound nouns with monosyllabic and special nouns.

Group A. SC 1 or SC 2.

SC 1    σ → <1acc>/ @ <1acc>....%..... @

SC 2    o → <1acc>/ @ .....%.....<1acc> @

hyo<sup>o</sup> 'list'

/<sup>?</sup>uri<sup>?</sup>age/+/<sup>h</sup>yo<sup>o</sup>/<sup>SC1</sup> /<sup>?</sup>uri<sup>?</sup>agehyoo/<sup>PA2</sup> [<sup>?</sup>uri<sup>?</sup>agehyoo]  
 'a list of sales'

/zikan/+/<sup>h</sup>yo<sup>o</sup>/<sup>SC2</sup> /zikanhyoo/<sup>PA4</sup> [zikanhyoo] 'a timetable'

/to<sup>o</sup>roku/+/<sup>h</sup>yo<sup>o</sup>/<sup>SC2</sup> /toorokuhyoo/<sup>PA4</sup> [toorokuhyoo]

'a list of registrations'

h<sup>u</sup> 'style'

/<sup>t</sup>ookyoo/+/<sup>h</sup>u/<sup>SC1</sup> /<sup>t</sup>ookyoo<sup>h</sup>u/<sup>PA2</sup> [tookyooh<sup>u</sup>]

'the Tookyoo style'

/p<sup>a</sup>ri/+/<sup>h</sup>u/<sup>SC2</sup> /parih<sup>u</sup>/<sup>PA4</sup> [parih<sup>u</sup>] 'the Paris style'

/<sup>n</sup>ihon/+/<sup>h</sup>u/<sup>SC2</sup> /nihonh<sup>u</sup>/<sup>PA4</sup> [nihonh<sup>u</sup>] 'the Japanese  
 style'

ka<sup>?</sup> 'person'

/<sup>k</sup>inben/+/<sup>k</sup>a/<sup>SC1</sup> /<sup>k</sup>inbenka/<sup>PA2</sup> [kinbenka] 'a hard  
 worker'

/ʔenzetu/+/ka/SC2 /ʔenzetuka/PA4 [ʔenzetuka] 'a public speaker'

ko 'powder'

/ʔmoti/+/ko/SC1 /ʔmotiko/PA2 [motiko] 'a powder for rice cake'

/komugi/+/ko/SC2 /komugiko/PA4 [komugiko] 'wheat flour' yoo 'use'

/ʔgakkoo/+/yoo/SC1 /ʔgakkooyoo/PA2 [gakkooyoo] 'school use'

/kazoku/+/yoo/SC2 /kazokuyoo/PA4 [kazokuyoo] 'family use'

/kokumin/+/yoo/SC2 /kokuminyoo/PA4 [kokuminyoo] 'people use'

siki 'style'

/ʔtowada/+/siki/SC1 /ʔtowadasiki/PA2 [towadasiki] 'the Towada style'

/ʔigirisu/+/siki/SC2 /ʔigirisusiki/PA4 [ʔigirisusiki] 'the English style'

/ʔgirisya/+/siki/SC2 /ʔgirisyasiki/PA4 [girisyasiki] 'the Greek style'

tura 'facade'

/ʔʔonago/+/tura/SC1 /ʔʔonagozura/PA2 [ʔʔonagozura]

'pose as a girl'

/sinsi/+/tura/SC2 /sinsizura/PA4 [sinsizura] 'pose as a gentleman'

/ʔotoko/+/tura/SC2 /ʔotokozura/PA4 [ʔotokozura] 'pose as a man'

husi (type of musical composition)

/ʔtowada/+/husi/SC1 /ʔtowadabusi/PA2 [towadabusi] 'the Towada busi'

/kusimoto/+/husi/SC2 /kusimotobusi/PA4 [kusimotobusi] 'the Kusimoto busi'

/kyuusyu/+/husi/SC2 /kyuusyuubusi/PA4 [kyuusyuubusi] 'the Kyuusyu busi'

Group B.

SC 2 applies.

zā 'seat, theater'

/ʼkabuki/+/zā/SC2 /kabukizā/PA4 [kabukizā] 'the kabuki theater'

/ʼoogon/+/zā/SC2 /ʼoogonzā/PA4 [ʼoogonzā] 'Oogon za'  
(the name of a theater)

/meizi/+/zā/SC2 /meizizā/PA4 [meizizā] 'Meijiza'  
(the name of a theater)

goo 'issue'

/ʼtokusyu/+/goo/SC2 /ʼtokusyugoo/PA4 [ʼtokusyugoo]  
'a special issue'

/saŋgatu/+/goo/SC2 /saŋgatugoo/PA4 [saŋgatugoo]  
'March's issue'

/ʼitigatu/+/goo/SC2 /ʼitigatugoo/PA4 [ʼitigatugoo]  
'January's issue'

Group C.

SC 3 or SC 4 and PA 1 or (and) PA 3.

SC 3 σ → <1acc> / @ (S) <1acc>....%<1acc>... @

SC 4 σ → <1acc> / @ ...<1acc>....%..... @

ʼke 'family'

/ʼʼikedā/+/ʼke/SC3 /ʼʼikedāke/PA1 [ʼʼikedāke] 'the Ikeda family'

/ʼsaidoo/+/ʼke/SC3 /ʼsaidooke/PA1 [ʼsaidooke] 'the Saidoo family'

/kobayāsi/+/ʼke/SC4 /kobayāsike/PA1 [kobayāsike] PA3

[kobayāsike] 'the Kobayasi family'

/hatāno/+/ʼke/SC4 /hatānoke/PA1 [hatānoke] PA3 [hatānoke]  
'the Hatano family'

ʼbi 'beauty'

/ʼtowada/+/ʼbi/SC3 /ʼtowadābi/PA1 [ʼtowadābi] 'Towada beauty'

/sizen/+/ʼbi/SC4 /sizenbi/PA1 [sizenbi] 'natural beauty'

/hakūti/+/ʼbi/SC4 /hakūtibi/PA1 [hakūtibi] PA3 [hakūtibi]  
'idiotic beauty'

ˈteki -ish'

/ˈseizi/+ /ˈteki/SC3 /seiziteki/PA1 [seiziteki]PA3

[seiziteki] 'political'

/ˈsyakai/+ /ˈteki/SC3 /syakaiteki/PA1 [syakaiteki]PA3

[syakaiteki] 'social'

/keizai/+ /ˈteki/SC3 /keizaiteki/PA1 [keizaiteki]PA3

[keizaiteki] 'economical'

/ˈamērika/+ /ˈteki/SC4 /ˈamērikateki/PA1 [ˈamērikateki]

PA3 [ˈamērikateki] 'American'

ˈgaku '-ology'

/ˈsyakai/+ /ˈgaku/SC3 /syakaigaku/PA1 [syakaigaku]PA3

[syakaigaku] 'sociology'

/ˈseizi/+ /ˈgaku/SC3 /seizigaku/PA1 [seizigaku]PA3

[seizigaku] 'political science'

/geŋgo/+ /ˈgaku/SC3 /gengogaku/PA1 [gengogaku]PA3 [gengogaku]

'linguistics'

/butūri/+ /ˈgaku/SC4 /butūrigaku/PA1 [butūrigaku]PA3

[butūrigaku] 'physics'

ˈgēki 'theater'

/ˈkoten/+ /ˈgēki/SC3 /kotengeki/PA1 [kotengeki]PA3

[kotengeki] 'classical play'

/ˈeigo/+ /ˈgēki/SC3 /eigogeki/PA1 [eigogeki]PA3

[eigogeki] 'English play'

/kindai/+ /ˈgēki/SC3 /kindaigeki/PA1 [kindaigeki]PA3

[kindaigeki] 'modern play'

/huraŋsu/+ /ˈgēki/SC4 /huraŋsugeki/PA1 [huraŋsugeki]PA3

[huraŋsugeki] 'French play'

ˈkōku 'country'

/ˈkyoowa/+ /ˈkoku/SC3 /kyoowakoku/PA1 [kyoowakoku]PA3

[kyoowakoku] 'a republic'

/ˈziyuu/+ /ˈkoku/SC3 /ziyuukoku/PA1 [ziyuukoku]PA3

[ziyuukoku] 'a free country'

/ʔindo/+/ʔkoku/SC3 /ʔindokoku/PA1 [ʔindokoku] PA3  
 [ʔindokoku] 'India'  
 /ʔaziya/+/ʔkoku/SC4 /ʔaziyakoku/PA1 [ʔaziyakoku] PA3  
 [ʔaziyakoku] 'Asian countries'

ʔryōku 'force'

/ʔtoosei/+/ʔryoku/SC3 /tooseiʔryoku/PA1 [tooseiʔryoku] PA3  
 [tooseiʔryoku] 'power to control'  
 /ʔtoosotu/+/ʔryoku/SC3 /toosoturyoku/PA1 [toosoturyoku]  
 PA3 [toosoturyoku] 'power to regulate'  
 /geñsi/+/ʔryoku/SC3 /gensiʔryoku/PA1 [gensiʔryoku] PA3  
 [gensiʔryoku] 'atomic power'  
 /yusyūtu/+/ʔryoku/SC4 /yusyūturyoku/PA1 [yusyūturyoku]  
 PA3 [yusyūturyoku] 'export power'

ʔsaku 'policy'

/ʔkaihoo/+/ʔsaku/SC3 /kaihoosaku/PA1 [kaihoosaku] PA3  
 [kaihoosaku] 'a policy for liberation'  
 /ʔkanwa/+/ʔsaku/SC3 /kanwasaku/PA1 [kanwasaku] PA3  
 [kanwasaku] 'a policy to relieve'  
 /boogyo/+/ʔsaku/SC3 /boogyosaku/PA1 [boogyosaku] PA3  
 [boogyosaku] 'a defence policy'  
 /sabetu/+/ʔsaku/SC4 /sabetusaku/PA1 [sabetusaku] PA3  
 [sabetusaku] 'a segregation policy'

ʔsiki 'ceremony'

/nyuugaku/+/ʔsiki/SC3 /nyuugakusiki/PA1 [nyuugakusiki]  
 PA3 [nyuugakusiki] 'an entrance ceremony'  
 /sotugyoo/+/ʔsiki/SC3 /sotugyoosiki/PA1 [sotugyoosiki]  
 PA3 [sotugyoosiki] 'a graduation ceremony'  
 /sensui/+/ʔsiki/SC3 /sensuisiki/PA1 [sensuisiki] PA3  
 [sensuisiki] 'diving ceremony'  
 /kekkoñ/+/ʔsiki/SC4 /kekkoñsiki/PA1 [kekkoñsiki] PA3  
 [kekkoñsiki] 'wedding'

## Group D.

SC 5 or SC 4 or (and) AR B.

SC 5  $\sigma \rightarrow \langle 1acc \rangle / @ \langle 1acc \rangle \dots \% \langle 1acc \rangle \dots @$ AR B  $\dots C(y)V \langle 1acc \rangle S) \% \rightarrow \dots S S \langle 1acc \rangle \%$ 

`ka' '-ification'

/bizin/+ /ka/  $\xrightarrow{SC5}$  /bizinka/  $\xrightarrow{PA1}$  [bizinka] 'beautification'/nooritu/+ /ka/  $\xrightarrow{SC5}$  /noorituka/  $\xrightarrow{ARB}$  /noorituka/  $\xrightarrow{PA4}$ 

[noorituka] 'development for efficiency'

/kikai/+ /ka/  $\xrightarrow{SC4}$  /kikaika/  $\xrightarrow{PA1}$  [kikaika] 'mechanization'

`kyoo' 'mirror, lens'

/kontyuu/+ /kyoo/  $\xrightarrow{SC5}$  /kontyuukyoo/  $\xrightarrow{PA1}$  [kontyuukyoo]

'an insect lens'

/kenbi/+ /kyoo/  $\xrightarrow{SC4}$  /kenbikyoo/  $\xrightarrow{PA1}$  [kenbikyoo]  $\xrightarrow{PA3}$  [kenbikyoo]

'a microscope'

/sanmen/+ /kyoo/  $\xrightarrow{SC4}$  /sanmenkyoo/  $\xrightarrow{PA1}$  [sanmenkyoo]

'a triple mirror'

`sen' 'battle'

/kyokutoo/+ /sen/  $\xrightarrow{SC5}$  /kyokutoosen/  $\xrightarrow{PA1}$  [kyokutoosen]

'a battle in the Far East'

/setuzyoku/+ /sen/  $\xrightarrow{SC5}$  /setuzyokusen/  $\xrightarrow{ARB}$  /setuzyokusen/ $\xrightarrow{PA4}$  [setuzyokusen] 'a return match'/taiheiyoo/+ /sen/  $\xrightarrow{SC4}$  /taiheiyooosen/  $\xrightarrow{PA1}$  [taiheiyooosen]  $\xrightarrow{PA3}$ 

[taiheiyooosen] 'the Pacific War'

`tai' 'party'

/tettoo/+ /tai/  $\xrightarrow{SC5}$  /tettootai/  $\xrightarrow{PA1}$  [tettootai]

'a party to pass the winter'

/kansoku/+ /tai/  $\xrightarrow{SC5}$  /kansokutai/  $\xrightarrow{ARB}$  /kansokutai/  $\xrightarrow{PA4}$ 

[kansokutai] 'a survey party'

/gerira/+ /tai/  $\xrightarrow{SC4}$  /geriratai/  $\xrightarrow{PA1}$  [geriratai]  $\xrightarrow{PA3}$  [geriratai]

'a guerrilla party'

`hoo' 'law'

/kyoozyu/+ /hoo/  $\xrightarrow{SC5}$  /kyoozyuhoo/  $\xrightarrow{ARB}$  /kyoozyuhoo/  $\xrightarrow{PA4}$ 

[kyoozyuhoo] 'teaching method'



/koōmu?in/+/'hoo/SC4 /koōmu?inhoo/PA1 [kōomu?inhoo]PA3  
[kōomu?inhoo] 'civil service law'

/kyoo?iku?i?in/+/'hoo/SC4 /kyoo?iku?i?inhoo/PA1

[kyoo?iku?i?inhoo] 'a law for a member of the Board of  
Education'

ʼganʼ 'rock'

/ʼkasei/+/'gan/SC5 /kaseigan /PA1 [kaseigan] 'an igneous  
rock'

/ʼtikuseki/+/'gan/SC5 /tikusekigan/ARB /tikusekigan/PA4

[tikusekigan] 'an accumulated rock'

/genbu/+/'gan/SC4 /genbugan/PA1 [genbugan]PA3 [genbugan]

'a basalt'

/kazan/+/'gan/SC4 /kazangan/PA1 [kazangan] 'a volcanic rock'

Group E.

SC 4 applies.

hā 'sect'

/ʼkyuusin/+/'hā/SC4 /kyuusinha/PA2 [kyuusinha] 'the  
radicals'

/ʼuyōku/+/'hā/SC4 /ʼuyōkuha/PA1 [ʼuyōkuha]PA3 [ʼuyōkuha]

'the right wing'

senʼ 'railway line'

/ʼtowada/+/'sen/SC4 /ʼtowadasen/PA2 [towadasen]

'Towada railroad'

/tookaidoo/+/'sen/SC4 /tookaidoosen/PA1 [tookaidoosen]PA3

[tookaidoosen] 'Tookaidoo railroad'

ʼkawa 'river'

/ʼhakodate/+/'kawa/SC4 /ʼhakodategawa/PA2 [hakodategawa]

'Hakodate river'

/ʼkimon/+/'kawa/SC4 /ʼkimongawa/PA2 [kimongawa]

'Kimon river'

/ʼedō/+/'kawa/SC4 /ʼedōgawa/PA1 [ʼedōgawa]PA3 [ʼedōgawa]

'Edo river'

$/\text{?iwaki}/+/\text{?kawa}/\text{SC4} \rightarrow /?\text{iwakigawa}/\text{PA1} \rightarrow [?\text{iwakigawa}]^{\text{PA3}}$   
 $[?\text{iwakigawa}]$  'Iwaki river'  
 $/\text{ron\ddot{d}on}/+/\text{?kawa}/\text{SC4} \rightarrow / \text{ron\ddot{d}ongawa}/\text{PA1} \rightarrow [\text{ron\ddot{d}ongawa}]^{\text{PA3}}$   
 $[\text{ron\ddot{d}ongawa}]$  'London river'

mati 'city'

$/\text{?towada}/+/\text{?mati}/\text{SC4} \rightarrow / \text{towadamati}/\text{PA2} \rightarrow [\text{towadamati}]$   
 'Towada city'  
 $/\text{?teppoo}/+/\text{?mati}/\text{SC4} \rightarrow / \text{teppoomati}/\text{PA2} \rightarrow [\text{teppoomati}]$   
 'Teppoo city'  
 $/\text{gihu}/+/\text{?mati}/\text{SC4} \rightarrow / \text{gihumati}/\text{PA1} \rightarrow [\text{gihumati}]^{\text{PA3}} \rightarrow [\text{gihumati}]$   
 'Gihu city'  
 $/\text{tanabu}/+/\text{?mati}/\text{SC4} \rightarrow / \text{tanabumati}/\text{PA1} \rightarrow [\text{tanabumati}]^{\text{PA3}}$   
 $[\text{tanabumati}]$  'Tanabu city'  
 $/\text{naizyosi}/+/\text{?mati}/\text{SC4} \rightarrow / \text{naizyosimati}/\text{PA1} \rightarrow [\text{naizyosimati}]^{\text{PA3}}$   
 $[\text{naizyosimati}]$  'Naizyosi city'

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