

TONE AND SYLLABLE IN KAGOSHIMA JAPANESE

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1. INTRODUCTION

This paper examines the accent (tonal) patterns of foreign words in Kagoshima Japanese, a dialect spoken in the south of Japan. This dialect is among those dialects in south-western Kyushu which have two contrastive tonal patterns, Tone A and Tone B. In Kagoshima Japanese, Tone A has a high tone on the penultimate syllable followed by an abrupt pitch fall, whereas Tone B bears a high tone on the final syllable followed by no pitch fall. As in many other dialects of Japanese, accentual/tonal distinctions in this dialect are believed to be basically unpredictable so that language learners have to learn tonal patterns word by word. This paper challenges this popular belief by demonstrating that English alphabetic letters such as *A*, *B* and *C* take either Tone A or Tone B depending on their syllable structure. Accordingly, the tonal patterns of compound words and phrases beginning with an alphabetic letter such as *SL* ‘steam locomotive’, *NHK* ‘Nihon Hoso Kyokai’, *A-gata* ‘A type’ and *B-tiimu* ‘B team’ are totally predictable from the syllable structure of the alphabetic letter. To demonstrate these points, this paper begins with a brief sketch of Kagoshima Japanese with main focus on its characteristic tonal features (section 2). This will be followed by a report of two experiments carried out with native speakers of this dialect as subjects (sections 3 and 4). Section 5 explores the reasons for the regular and irregular patterns pertaining to alphabetic accent. Section 6 summarizes the main points of the paper.

2. TONAL SYSTEM OF KAGOSHIMA JAPANESE

2.1. Salient Features

The tonal system of Kagoshima Japanese is very unique and strikingly different from that of Tokyo or Kyoto/Osaka Japanese in several crucial ways. First, Kagoshima Japanese permits only two accentual (or tonal) patterns, traditionally called A and B (Hirayama 1951). Tone A involves a pitch fall towards the end of the word, with only the penultimate syllable high-toned. Tone B, on the other hand, does not involve an abrupt pitch fall and keeps only the final syllable high-toned. These two types are exemplified in (1) and (2), respectively, where loanwords are used for illustration. In these examples and in the rest of the paper, high-toned portions are capitalized and syllable boundaries are denoted by dots (.). According to Kibe and Hashimoto (2003),

the two tonal patterns are equally popular in Kagoshima Japanese as a whole so that words belonging to one tonal type do not outnumber those belonging to the other type.

- (1) ka.NA.da ‘Canada’, DOI.tu ‘Germany’, IN.do ‘India’, HA.wai ‘Hawaii’,
su.WEE.den ‘Sweden’
- (2) a.me.ri.KA ‘America’, i.gi.ri.SU ‘England, Britain’, hu.ran.SU ‘France’

A second salient feature of Kagoshima Japanese is that its prosodic system is based on the syllable rather than the mora (Sibata 1962, Kibe 1997, 2000, Kubozono 1999). As is clear from (1) and (2), this dialect determines its tonal patterns entirely on the syllable rather than the mora. This nature is manifested in two distinct ways. First, the distance from the end of the word is determined by counting the number of syllables. The loci of high tone in (1), for example, can be generalized by stating ‘find the second syllable from the end of the word and keep it high-toned.’ This generalization holds in a syllable-counting dialect like Kagoshima Japanese, but not in a mora-counting dialect like Tokyo Japanese. In Tokyo, the words in (1) are ‘accented’ basically on the antepenultimate mora, i.e. a sudden pitch fall occurs between the second and third moras from the end of the word. This is illustrated in (3).

- (3) KA.na.da ‘Canada’, DOi.tu ‘Germany’, In.do ‘India’, HA.wai ‘Hawaii’

Kagoshima Japanese is not only a ‘syllable-counting’ dialect; the tone bearing unit is also the syllable rather than the mora. Thus, penultimate syllables are high-toned in (1), whereas final syllables are high-toned in (2). Note that the accent-bearing unit in Tokyo Japanese is also the syllable (McCawley 1978), but this is different from the situation we find in Kagoshima Japanese. In Tokyo, so-called ‘non-syllabic moras’ like the moraic nasal, moraic obstruent and the second half of long vowels and diphthongs, cannot bear an accent. The accent placed on these elements by rule is automatically shifted to the mora immediately preceding them, that is, onto the ‘syllabic mora’ of the syllable concerned. This creates a high tone on the syllabic mora, but a low tone on the following non-syllabic mora within the same accented syllable: e.g. /su.weE.den/ /su.WEe.den/ ‘Sweden’. In Kagoshima Japanese, this word is pronounced with a high tone on the penultimate syllable: /su.WEE.den/. This contrast reveals a crucial difference between Tokyo and Kagoshima Japanese: The tone-bearing unit is the mora in Tokyo, whereas it is the syllable in Kagoshima. In other words, Tokyo Japanese distinguishes between the accent-bearing unit (syllable) and the tone-bearing unit (mora), while Kagoshima Japanese makes no such distinction. The latter only needs the tone-bearing unit, which is the syllable.

Since Kagoshima Japanese is a syllable-counting language in which syllables rather than moras carry a high/low tone, it is rather easy to identify syllable boundaries in this dialect. One advantage of this, which is not readily available in Tokyo Japanese, is that it is possible to identify diphthongs as against vowel sequences across a syllable boundary. Kubozono (2004) looked at the tonal data of Kagoshima Japanese from this viewpoint and found out that /ai/, /oi/ and /ui/ are genuine diphthongs, whereas other vowel sequences including /au/, /ao/ and /oe/ are heterosyllabic vowel sequences, i.e. they form two separate syllables. It is interesting that /au/ and /ao/ do not form a

diphthong although they involve a falling sonority just as do /ai/ and /oi/. This distinction between genuine and pseudo diphthongs becomes crucial when we discuss the correlation between tonal patterns and syllable structure later in this paper.

Returning to the main line of argument, a third major tonal feature characteristic of Kagoshima Japanese concerns its compound rule. In Tokyo Japanese, the basic accent pattern of compound words is determined by the final member, so that one and the same accent pattern emerges in compound words sharing this member (see Kubozono 1995, 1997 for a foot-based generalization). Thus, all the names of prefectures in (4) are accented on the final syllable of the first member. In (4) and the rest of this paper, accent in Tokyo Japanese is marked by an apostrophe placed on the accented vowel, i.e. the nuclear vowel of the accented syllable. In phonetic terms, pitch stays high until the end of the accented mora/vowel and then becomes low thereafter.

- (4) hyoo.gó-ken ‘Hyogo Prefecture’, ka.go.si.má-ken ‘Kagoshima Prefecture’,
hi.ro.si.má-ken ‘Hiroshima Prefecture’, na.ga.sa.kí-ken ‘Nagasaki Prefecture’

In Kagoshima Japanese, in contrast, the tonal pattern of compounds is determined by their first member. Specifically, compounds bear a high tone on the penultimate syllable if their first member belongs to Tone A, while they bear a high tone on their final syllable if their first member is a Tone B word. This is shown in (5a) and (5b), respectively, with the same names of prefectures in (4).

- (5) a. HYOO.go, hyoo.GO-ken; ka.go.SI.ma, ka.go.si.MA-ken
b. hi.ro.si.MA, hi.ro.si.ma-KEN; na.ga.sa.KI, na.ga.sa.ki-KEN

The automatic rightward shift of a high tone in compounds is a very unique property of this dialect. This is partly responsible for the fact that only two tonal patterns, A and B, are found no matter how long a word may be. This is illustrated in (6), with the word ‘Kagoshima’ as an example.

- (6) ka.go.SI.ma, ka.go.si.MA.ken ‘Kagoshima Prefecture’, ka.go.si.ma.KEN.min
‘people in Kagoshima Prefecture’, ka.go.si.ma.dai.GA.ku ‘Kagoshima University’

A fourth major characteristic of the tonal system of Kagoshima Japanese has to do with the tone shift illustrated in (5) and (6). In this dialect, the tone shift in question is not bound by word boundaries but occurs across a word boundary within a minimal syntactic phrase equivalent to the so-called ‘bunsetsu’. Thus, all minimal phrases beginning with the word ‘Kagoshima’ bear a high tone on their penultimate syllable by inheriting the tonal pattern (Tone A) from this initial element (NOM and GEN stand for nominative and genitive markers, respectively).

- (7) ka.go.SI.ma, ka.go.si.MA-ga ‘Kagoshima-NOM’, ka.go.si.MA-no
‘Kagoshima-GEN’, ka.go.si.ma-KA.ra ‘from Kagoshima’, ka.go.si.ma-ka.RA.mo
‘from Kagoshima, too’

The same is true of words with Tone B. Phrases beginning with the word ‘Nagasaki’, for example, are always high-toned on their final syllable because their initial word belongs to Tone B.

(8) na.ga.sa.KI, na.ga.sa.ki-GA, na.ga.sa.ki-NO, na.ga.sa.ki-ka.RA ‘from Nagasaki’,
na.ga.sa.ki-ka.ra.MO ‘from Nagasaki, too’

The tone shift within the domain of the minimal phrase does not occur in Tokyo Japanese. Particles such as /ga/ and /kara/ do not constitute an independent accentual unit in this dialect, either, but they simply attach to a content word without changing its accent pattern. In other words, the tonal pattern of content words is fixed and does not change in a larger domain, as illustrated in (9).

(9) KA.na.da ‘Canada’, KA.na.da-ga ‘Canada-NOM’, KA.na.da-ka.ra ‘from Canada’,
KA.na.da-ka.ra.mo ‘from Canada, too’

2.2. *Factors Determining Tonal Patterns*

I have so far summarized four salient properties of the tonal system of Kagoshima Japanese. An important question concerning this dialect as well as other dialects of Japanese is whether the tonal/accental pattern of a word is predictable from its linguistic information such as morphological and phonological structures. In Kagoshima Japanese, this is a question of whether choice of a particular tonal pattern—Tone A or Tone B—for a particular word is unpredictable and hence must be specified in the lexicon. The traditional analyses of this dialect generally give an affirmative answer to this question, at least from a synchronic point of view. Let us see this point both in native Japanese words and in so-called loanwords, i.e. loanwords from languages other than Chinese.

One interesting fact about Kagoshima tonology is that most nouns and verbs take opposite tonal patterns from those of Tokyo Japanese. Nouns and verbs in Tokyo Japanese can be either accented or unaccented, with the former class of words but not the latter involving an abrupt pitch fall. The two tonal patterns of Kagoshima Japanese can be classified in the same manner in that Tone A but not Tone B involves a sudden pitch fall. Interestingly, accented nouns and verbs in Tokyo Japanese are usually pronounced with Tone B, i.e. without any sudden pitch fall in Kagoshima Japanese. Likewise, most unaccented nouns and verbs in Tokyo take Tone A in Kagoshima: these words are pronounced with a sudden pitch fall in Kagoshima but not in Tokyo. These tonal correspondences between Tokyo and Kagoshima Japanese are attributable to a historical coincidence whereby Kagoshima Japanese has made its own historical development from old (Kyoto) Japanese, possibly via medieval Tokyo Japanese.

Table 1 summarizes tonal correspondences among dialects for the three types of monomoraic nouns and five types of bimoraic nouns. and indicate high and low tones for each mora/syllable in the noun, whereas and indicate high and low tones for a particle following it [NOTE 1]. In old (Kyoto) Japanese, these different types of words had different tonal patterns from each other, which merged in different ways in different dialects of Japanese. In modern Tokyo dialect, for example, monomoraic nouns underwent a tonal merger between Class 1 and Class 2, whereas Class 2 and Class 3 merged in the development of Kagoshima Japanese. Bimoraic

nouns underwent similar changes with different dialects exhibiting a merger between different classes of nouns [NOTE 2].

Table 1 Accent classes and modern accent of native nouns

	<u>Kyoto</u>	<u>Tokyo</u>	<u>Kagoshima</u>
Monosyllabic			
Class 1			柄が、蚊が
Class 2			葉が、日が
Class 3			絵が、火が
Bisyllabic			
Class 1			飴(が)、牛(が)
Class 2			岩(が)、歌(が)
Class 3			足(が)、犬(が)
Class 4			糸(が)、海(が)
Class 5			秋(が)、雨(が)

Kagoshima Japanese displays contrastive tonal patterns with Tokyo Japanese in verbs just as they do in nouns. Verbs in Tokyo Japanese fall into two groups, accented and unaccented, with the former almost always bearing an accent on the penultimate mora. Verbs in Kagoshima Japanese also fall into two groups, Tone A and Tone B. Interestingly, verbs involving an abrupt pitch fall, i.e. accented verbs, in Tokyo Japanese are mostly pronounced with Tone B, i.e. with no pitch fall, in Kagoshima Japanese. On the other hand, unaccented verbs in Tokyo Japanese generally take Tone A in Kagoshima Japanese. This is illustrated in (10) below.

(10) Tonal patterns in verbs

	naru	naru	hareru	hareru
	‘to achieve’	‘to ring’	‘to clear’	‘to swell up’
Tokyo				
Kagosima				

While native nouns and verbs display largely opposite tonal patterns between Tokyo and Kagoshima Japanese, loanwords from English and other languages exhibit very similar tonal patterns in the two dialects. As is well known, 90% of loanwords in Tokyo Japanese are accented, while 10% of loanwords are unaccented (Sibata 1994). In Kagoshima Japanese, 95% of loanwords take Tone A, exhibiting an abrupt pitch fall, whereas Tone B accounts for only 5% of loanwords (Sibata 1994). Consequently, most loanwords involve a sudden pitch fall in both Tokyo and Kagoshima. Tonal patterns in Kagoshima Japanese are illustrated in (11) with the same placenames in (1) and (2).

(11) Tonal patterns of loanwords in Kagoshima.

- a. Tone A (95%) : ka.NA.da, DOI.tu, IN.do, HA.wai, in.do.ne.SI.a, su.WEE.den
- b. Tone B (5%) : a.me.ri.KA, i.gi.ri.SU, hu.ran.SU

Equally interesting is the fact that some loanwords in Kagoshima Japanese are changing their tonal patterns from Tone A to Tone B. Most of them are unaccented words in Tokyo Japanese (Kubozono 2003a, Kibe & Hashimoto 2004). Some examples are given in (12) ; tonal patterns in Tokyo are given in brackets.

- (12) bu.ra.ZI.ru bu.ra.zi.RU ‘Brazil’ (bu.RA.ZI.RU)
 ga.SO.rin ga.so.RIN ‘gasoline’ (ga.SO.RIN)
 dai.A.ru dai.a.RU ‘dial’ (da.I.A.RU)
 bi.hu.TE.ki bi.hu.te.KI ‘beef-steak’ (bi.HU.TE.KI)
 pi.su.TO.ru pi.su.to.RU ‘pistol’ (pi.SU.TO.RU)

On the other hand, some loanwords that used to be pronounced with Tone B are now pronounced with Tone A in Kagoshima. Most of these are accented nouns in Tokyo Japanese (Kubozono 2003a). This is exemplified in (13).

- (13) doo.na.TU doo.NA.tu ‘donut’ (cf. Tokyo: DOo.natu)

It is extremely interesting that native words and loanwords display entirely contrastive tonal behaviors. Tokyo and Kagoshima Japanese tend to display opposite tonal patterns in native words, while they tend to exhibit similar tonal patterns in loanwords. One explanation for the cross-dialectal similarity in loanwords is that the auditory impression of the original word plays a pivotal role in determining the tonal pattern of its loan form. In foreign languages, especially in English, words are accented and, hence, involve a pitch fall when they are pronounced in isolation. This acoustic pattern is readily heard by native speakers of Japanese, who identify them as accented words in Tokyo Japanese and as Tone A in Kagoshima Japanese. Furthermore, the ongoing tonal changes in Kagoshima Japanese illustrated in (12) and (13) suggest that Kagoshima speakers determine the tonal patterns of loanwords on the basis of their tonal patterns in Tokyo Japanese. Namely, Kagoshima Japanese does not borrow loanwords directly from their source language but rather via Tokyo Japanese.

3. EXPERIMENT 1

3.1. Method

This experiment is designed to examine the tonal pattern of so-called alphabetic acronyms such as *JR* ‘Japan Railways’, *NHK* ‘Nihon Hoso Kyokai’ and *OL* ‘office lady, or female office worker’. English alphabetic letters fall into the three types in (14) according to their syllabic composition. Monosyllabic letters outnumber bisyllabic and trisyllabic ones. Of the sixteen monosyllabic elements, *I*, *V* and *Y* involve a diphthong, while others constitute a monophthong with a long vowel. This difference turns out to have a significant meaning later in this paper (section 5.4).

- (14) a. monosyllabic (16 letters)
 ee (A), bii (B), sii [ʔi:] (C), dii (D), ii (E), zii [dʔi:] (G), ai (I), zyee [dʔe:] (J),
 kee (K), oo (O), pii (P), kyuu [kju:] (Q), tii (T), yuu [ju:] (U), bui (V), wai (Y)

- b. bisyllabic (8 letters)
e.hu (F), ei.ti (H), e.ru (L), e.mu (M), e.nu (N), aa.ru (R), e.su (S), zet.to (Z),
- c. trisyllabic (2 letters)
da.bu.ryuu (W), ek.ku.su (X)

The dataset used in the experiment consists of 42 two-letter and 38 three-letter acronyms used in Japanese [NOTE 3]. Each group further falls into three categories according to the syllable structure of their first element/letter, or N1: monosyllabic, bisyllabic or trisyllabic. This gives rise to six groups of test words as in (15).

- (15) a. two-letter acronyms with a monosyllabic initial letter: e.g. *OL*
- b. three-letter acronyms with a monosyllabic initial letter: e.g. *PTA*
- c. two-letter acronyms with a bisyllabic initial letter: e.g. *SL*
- d. three-letter acronyms with a bisyllabic initial letter: e.g. *NHK*
- e. two-letter acronyms with a trisyllabic initial letter: e.g. *WC*
- f. three-letter acronyms with a trisyllabic initial letter: e.g. *WHO*

Table 2 gives the number of test words that belong to each group. An exhaustive list is given in Appendix 1.

Table 2 Classification and number of test words

Syll structure of N1 No. of letters	monosyllabic	bisyllabic	trisyllabic	total
2 letter	28	12	2	42
3 letter	30	7	1	38
Total	58	19	3	80

The test words were semi-randomized and read by four native speakers of Kagoshima Japanese individually. These subjects are all male speakers three of whom are in their forties and the remaining one in his sixties. They were asked to read each test word twice. Their pronunciations were recorded on a digital audio tape and were subsequently analyzed by the experimenter on an auditory basis.

3.2. Results

This experiment produced 320 tokens for analysis (80 words x 4 speakers). The results of the tonal analysis are given in Table 3, which summarizes the data of all the four subjects.

Table 3 Results of Experiment 1 (summary of four speakers)

Structure \ Tone	(15a)	(15b)	(15c)	(15d)	(15e)	(15f)	Total
Tone A	11 (10%)	25 (21%)	47 (98%)	27 (96%)	8 (100%)	4 (100%)	122 (38%)
Tone B	101 (90%)	94 (78%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	196 (61%)
Others	0 (0%)	1 (1%)	0 (0%)	1 (4%)	0 (0%)	0 (0%)	2 (1%)
Total	112 (100%)	120 (100%)	48 (100%)	28 (100%)	8 (100%)	4 (100%)	320 (100%)

It is clear from the data in Table 3 that alphabetic acronyms choose between Tone A and Tone B depending on the syllable structure of their first member. Specifically, those that begin with a monosyllabic element, (15a) and (15b), predominantly take Tone B, whereas most of those whose initial element is polysyllabic—(15c) through (15f)—take Tone A. This leads to the generalization summed up in (16).

(16) Generalization

Acronyms take Tone B if their first alphabetic letter is monosyllabic. Acronyms are pronounced with Tone A if their initial letter is polysyllabic (bisyllabic or trisyllabic).

This generalization admitted a certain number of exceptions. Notably, acronyms favor Tone A over Tone B if they begin with *Q*, *V* or *Y*. In fact, all the sixteen tokens that begin with either *Q* or *Y* were pronounced with Tone A. Similarly, seven of the eight tokens beginning with *V* were pronounced with the same pattern. These 23 tokens actually account for over 60% of the exceptional cases where acronyms of the types in (15a) and (15b) were pronounced with Tone A. We will return to these exceptional cases later.

4. EXPERIMENT 2

We saw in section 2 above that compound nouns choose between Tone A and Tone B depending on whether their initial element is a Tone A or Tone B morpheme. Since alphabetic acronyms consist of more than one alphabetic letter and, in this sense, constitute a compound noun, the generalization in (16) can be taken as suggesting that alphabetic letters themselves yield Tone A or Tone B depending on whether they are polysyllabic or monosyllabic. It can be assumed, more specifically, that monosyllabic alphabetic letters are morphemes creating a Tone B pattern, whereas polysyllabic elements are Tone A morphemes. The validity of this interpretation can be borne out by examining the tonal pattern of compound nouns and phrases that begin with an alphabetic letter. A second experiment was carried out to test this hypothesis.

4.1. Method

Sixteen native speakers of Kagoshima Japanese participated in this experiment as subjects. Nine of them are male speakers, four of whom are the same speakers who participated in the first experiment. The remaining five male subjects are in their forties or early fifties. Seven female speakers are all in their forties or early fifties.

The test items used in this experiment fall into five groups or sets illustrated in (17), with each set consisting of 26 words/phrases. Each item of these sets combines one of the 26 alphabetic letter and one of the following five elements : (a) the nominative marker /ga/, (b) the noun /ka.ta/ ‘type’, which alternates with /ga.ta/ in surface forms, (c) the noun /ku.mi/ ‘class’, which alternates with /gu.mi/ in compounds, (d) a suffix /san/ ‘Mr. or Ms.’, and (e) the noun /tii.mu/ ‘team’. These items were not randomized but arranged in the order listed in (17). Each of the items was read once by each subject. The recorded data were subsequently analyzed by the experimenter auditorily.

(17) Test words in Experiment 2

- a. ee-ga ‘A-Nom’, bii-ga ‘B-Nom’, sii-ga ‘C-Nom’...zetto-ga ‘Z-Nom’
- b. ee-gata ‘A type’, bii-gata ‘B type’, sii-gata ‘C type’...zetto.gata ‘Z type’
- c. ee-gumi ‘Class A’, bii-gumi ‘Class B’, sii-gumi ‘Class C’...zetto-gumi ‘Class Z’
- d. ee-san, ‘Mr. A’, bii-san ‘Mr. B’, sii-san ‘Mr. C’...zetto-san ‘Mr. Z’
- e. ee-tiimu ‘A team’, bii-tiimu ‘B team’, sii-tiimu ‘C team’...zetto-tiimu ‘Z team’

4.2. Results

This experiment yielded 2,080 tokens as sixteen speakers pronounced 130 test items. These tokens were analyzed with respect to their tonal pattern. The results of this analysis are summarized in Table 4, where monosyllabic initial elements are classified into five subgroups—*Q*, *Y*, *I*, *V* or other monosyllabic elements.

Table 4 Results of Experiment 2 (summary of sixteen speakers)

Tone \ N1	Polysyllabic	Q	Y	I	V	Monosyllabic	Total
Tone A	800 (100%)	78 (98%)	74 (93%)	34 (42%)	74 (93%)	58 (6%)	1,118 (54%)
Tone B	0 (0%)	2 (2%)	6 (7%)	46 (58%)	6 (7%)	902 (94%)	962 (46%)
Total	800 (100%)	80 (100%)	80 (100%)	80 (100%)	80 (100%)	960 (100%)	2,080 (100%)

The data in Table 4 clearly show that words and phrases beginning with a polysyllabic alphabetic letter invariably take Tone A. This rule actually admitted no exception. On the other hand, monosyllabic initial letters other than *Q*, *Y*, *I* and *V* predominantly favor Tone B, which accounts for 94% of the relevant data. This rule admits 58 tokens (or 6%) as exceptions, but 30 tokens out of 58 come from one female

speaker. Excluding this speaker, all speakers almost invariably chose Tone B for words and phrases beginning with a monosyllabic letter other than *Q*, *Y*, *I* and *V*.

Table 4 also shows that *Q*, *Y* and *V* exhibit an exceptional tonal behavior in this experiment just as they did in the first experiment. Namely, these three monosyllabic elements pattern with polysyllabic elements in preferring Tone A in most cases. Interestingly, the letter *I* displayed a somewhat intermediate behavior as it gives rise to Tone B in about 60% of the data, while taking Tone A in the remaining 40% of the data.

5. DISCUSSION

5.1. Summary and question

From the foregoing discussion, it is now clear that there is a marked correlation between tone and syllable structure in English alphabetic letters spoken in Kagoshima Japanese. In fact, the tonal pattern of a compound word or phrase beginning with an alphabetic letter is readily predictable from the syllable structure of the initial element. Thus, words/phrases beginning with a polysyllabic letter almost invariably take Tone A while words/phrases beginning with a monosyllabic letter predominantly favor Tone B. Given the general compound rule described in section 2.1, it follows that polysyllabic alphabetic letters are Tone A morphemes, while monosyllabic ones are Tone B morphemes in this dialect.

Given this generalization, one should quite naturally wonder why syllable structure and tone show such a correlation in alphabetic letters at all. Note here that this generalization cannot be extended to ordinary loanwords from English and other languages. Kagoshima Japanese has a number of monosyllabic and bisyllabic loanwords, but virtually all of them take Tone A in its tonal system. Thus, monosyllabic morphemes in (18a) are pronounced with a falling contour tone, while polysyllabic morphemes in (18b) bear a high tone on the penultimate syllable when pronounced in isolation. This is a simple reflection of the general fact mentioned in (11) above, namely, that 95% of loanwords are pronounced with Tone A (i.e. a falling tonal pattern) in Kagoshima Japanese.

- (18) a. PAn ‘bread’, KAn ‘can’, BAn ‘van’, Kli ‘key’, KAa ‘car’, PAi ‘pie’
b. BA.su ‘bus’, PI.za ‘pizza’, BI.ru ‘building’, RU.bi ‘ruby (typesetting term)’

Given the fact in (18), it turns out that there is nothing peculiar about the fact that polysyllabic alphabetic letters behave as Tone A morphemes in Kagoshima Japanese: they are a kind of loanword and pattern as such in the tonal system of the dialect. What is truly interesting then is the first half of the generalization in (16), namely, that alphabetic letters take Tone B if they are monosyllabic. This is the real question that should be asked about the tone and syllable correlation in question.

This question can be tackled from at least two perspectives. First, we can ask why the two parameters do not exhibit an opposite type of correlation, that is, why it is not the case that polysyllabic letters take Tone B while monosyllabic ones take Tone A. The other way of looking at the interesting correlation in question is to ask if the tone of alphabetic letters might have something to do with the tone of Sino-Japanese (SJ)

morphemes, many of which are monosyllabic. We will explore these two possibilities in the following subsections.

5.2. *Correlation between syllable structure and tone*

Let us first consider what is good about the observed correlation between tone and syllable. To do this, let us compare the observed correlation in (19) with a hypothetical opposite correlation in (20), where monosyllabic alphabetic letters take Tone A and polysyllabic ones Tone B.

- (19) a. ee-gu.MI ‘Class A’
b. e.mu-GU.mi ‘Class M’

- (20) a. ee-GU.mi ‘Class A’
b. e.mu-gu.MI ‘Class M’

A close comparison between (19) and (20) suggests that a tonal uniformity is achieved in the former, but not the latter. The two tonal patterns in (19) can be generalized if the high-toned syllables are counted from the beginning of the word. Namely, both (19a) and (19b) involve a high tone on the third syllable—/MI/ in (19a) and /GU/ in (19b). This uniformity is not available in (20) since (20a) and (20b) have a high tone on the second and fourth syllables, respectively, counted from the beginning of the words.

While a uniformity of this kind seems to generalize the two tonal patterns in (19), it is worth noting that it cannot be extended to all alphabetic letters. Among English alphabets there are two trisyllabic ones, *W* and *X*, as mentioned in (14) above. Words and phrases beginning with such a letter do not conform to the generalization proposed here since, as exemplified in (21), they involve a high tone on the fourth syllable rather than the third one from the beginning of the word. In this sense, the observed correlation between tone and syllable structure is yet to be fully generalized.

- (21) da.bu.ryuu.GU.mi ‘Class W’
ek.ku.su.GU.mi ‘Class X’

5.3. *Sino-Japanese morphemes and loanwords*

A second possibility that accounts for the observed correlation in general and the peculiar tonal behavior of monosyllabic alphabetic letters in particular is an effect of tonal patterns shown by SJ morphemes in Japanese. SJ morphemes were incorporated into Japanese many centuries ago, but they still have some features distinct from native Japanese morphemes. In terms of a vowel inventory, for example, SJ morphemes permit all five short vowels like their native counterparts, but permit only three long vowels, /e:/, /o:/ and /u:/. Furthermore, of the three permitted long vowels, /o:/ is much more common than the other two, accounting for 70% of all long vowels occurring in SJ morphemes. These asymmetries are main characters of SJ morphemes, which are not shared by native morphemes.

Returning to the tonal phenomena in Kagoshima Japanese, a thorough examination of SJ morphemes in Hirayama’s (1960) dictionary reveals an interesting asymmetry between the two tonal patterns. The dictionary lists 1,488 monosyllabic SJ

morphemes, of which 504 contain a long vowel, i.e. /(C)V:/. Of these, 327 (65%) take Tone B, while 177 (35%) take Tone A. In contrast, only 52% of 606 monosyllabic SJ morphemes containing a nasal stop in the coda position, i.e. /(C)VN/, take Tone B. The ratio of Tone B is even lower in monosyllabic SJ morphemes consisting of a short vowel and a coda obstruent, i.e. /(C)VC/ : 44%, or 168 morphemes, take Tone B, while the remaining 56% or 210 morphemes take Tone A.

The ratio of Tone B SJ morphemes becomes even higher if we restrict our analysis to monosyllabic morphemes that are used independently, i.e. as a free morpheme. Of the 504 SJ monosyllabic morphemes with a long vowel, 82 are listed in the dictionary as an independently used word. Of these 57 (70%) are Tone B morphemes. In other words, seven out of ten SJ morphemes exhibit Tone B on average if they are monosyllabic and used independently. Note that each alphabetic letter studied in this paper is also used as a free morpheme in Japanese.

Given these figures, it is evident that monosyllabic SJ morphemes with a long vowel show a striking tendency to take Tone B. It remains unclear why this type of asymmetry happens in the first place, but given this asymmetry, it is possible that monosyllabic alphabetic letters containing a long vowel should pattern with SJ morphemes of the same phonological structure in favoring Tone B. This speculation is supported, at least in part, by the fact that monosyllabic alphabetic letters exhibit Tone A if they contain a diphthong rather than a long vowel. We will see this point in the next section.

5.4. Explanation of exceptions

We saw in sections 3 and 4 above that some monosyllabic alphabetic letters exhibit an exceptional tonal pattern. Specifically, *Q*, *V* and *Y* show the same behavior as polysyllabic letters to take Tone A. In addition, the letter *I* also takes Tone A in many cases although it favors Tone B in a majority of cases. It is important to ask why these four monosyllabic letters display an exceptional behavior.

It should be made clear, first of all, that these four letters form a single syllable rather than a concatenation of two syllables in Kagoshima Japanese. This can be confirmed very easily by looking at the tonal pattern of words and phrases in which those letters appear near their right edge. This is illustrated in (22).

- (22) a. zii.ei.ti.KYUU ‘GHQ, general headquarters’
 b. ee.WAI ‘AY, initials for Akio Yamada’
 c. ee.AI ‘AI, artificial intelligence’
 d. ee.BUI ‘AV, audio visual’

Words in (22) begin with a monosyllabic letter and so should exhibit Tone B, with only the final syllable high-toned. The actual tonal configurations in (22) indicate that /kyuu/ ‘Q’, /wai/ ‘Y’, /ai/ ‘I’ and /bui/ ‘V’ form the final syllable of each word. Should they form a sequence of two syllables, we would expect to find patterns like /zii.ei.ti.kyu.U/ and /ee.a.I/ for (22a, c), but they are impossible pronunciations in Kagoshima Japanese. Why then should the four alphabetic letters behave like bisyllabic letters?

One answer to this question lies in the fact that *I*, *Y* and *V* contain a diphthong. These are actually the only three monosyllabic alphabetic letters that have a diphthong rather than a long vowel in Kagoshima Japanese (section 4.1). Note that diphthongs and

long vowels often display different behaviors in Japanese phonology, with the former showing a stronger tendency to pattern with a sequence of two syllables than the latter. In music, for example, a syllable with a diphthong is assigned two musical notes rather than one in 94% of cases. In contrast, a syllable with a long vowel is associated with two musical notes in 70% of cases. This latter ratio is certainly higher than the ratio for syllables with a moraic nasal (51%) or a moraic obstruent (36%), but it is considerably lower than the ratio for a syllable with a diphthong (Kubozono 1999). Since a sequence of two syllables almost invariably receives two musical notes, it follows that a syllable with a diphthong exhibits a pattern intermediate between a syllable with a long vowel and a sequence of two syllables. This fact from music accords with the fact that diphthongs tend to behave like a sequence of two syllables in the tonal pattern of alphabetic acronyms and similar words in Kagoshima Japanese.

Why then does *Q* also take Tone A? Since *Q* contains a long vowel rather than a diphthong, it should pattern with other alphabetic letters with a long vowel to yield Tone B. One possible account for this exceptional tonal behavior of *Q* comes from the fact that all SJ morphemes with the same phonemic form as *Q*, i.e. /kyuu/, take Tone A in Kagoshima Japanese. Some of these morphemes are illustrated in (23), where they form the first member of SJ compounds.

- (23)
- a. 旧 ‘old’ : KYUU.sei ‘maiden name’, kyuu.RE.ki ‘lunar calendar’
 - b. 九 ‘nine’ : KYUU.syuu ‘Kyushu (place name), KYUU.kai ‘nine times, ninth inning’
 - c. 球 ‘ball’ : KYUU.gi ‘ball game’, KYUU.zyoo ‘stadium’
 - d. 休 ‘break, rest’ : KYUU.koo ‘no class’, kyuu.SYO.ku ‘suspension of work’
 - e. 急 ‘sudden’ : KYUU.koo ‘express train’, KYUU.sei ‘acute’
 - f. 級 ‘class’ : KYUU.tyoo ‘head of a class, prefect’, KYUU.yuu ‘classmate’
 - g. 宮 ‘palace’ : KYUU.tei ‘Imperial court’, KYUU.den ‘palace’

It is a noteworthy fact that over twenty SJ morphemes that have the phonemic form /kyuu/ are all Tone A morphemes in the tonal system of Kagoshima Japanese. This is not true of all SJ morphemes, of course. Excepting *Q*, there are six alphabetic letters that have an identical phonemic form to SJ morphemes : *A* /ei/ (freely alternating with /ee/), *I* /ai/, *K* /kei/ (or /kee/), *O* /oo/, *Q* /kyuu/, *U* /yuu/ and *Y* /wai/. In the SJ stratum, morphemes with these phonemic forms exhibit either Tone A or Tone B, depending on the particular morpheme. For example, the morpheme /oo/ meaning ‘Europe’ is a Tone A morpheme, whereas the morpheme /oo/ meaning ‘king’ is a Tone B morpheme. The only exception to this is SJ morphemes of the phonemic form /ai/. There are twelve SJ morphemes of this phonemic form, all of which somehow show Tone A. These tonal patterns shown by SJ morphemes are illustrated in (24)-(29).

(24) /ei/-/ee/

- a. 永 ‘a long time’ : EI.kyuu ‘forever’, EI.en ‘forever’
 英 ‘Britain’ : ei.KO.ku ‘Britain’, EI.yuu ‘hero’
 映 ‘mirror’ : EI.ga ‘movies’, ei.GA.kan ‘film theater’
- b. (no instance found)

(25) /ai/

- a. 挨 ‘to push’ : ai.SA.tu ‘greeting’
- b. 愛 ‘love’ : ai.ZYOO ‘love’, ai.ZIN ‘mistress, sweet heart’

(26) /kei/-/kee/

- a. 計 ‘to measure’ : KEI.san ‘calculation’, kei.KA.ku ‘plan’
景 ‘scene’ : KEI.ki ‘economic climate’, KEI.kan ‘landscape’
- b. 警 ‘caution’ : kei.sa.TU ‘police’, kei.BI ‘security’

(27) /ou/-/oo/

- a. 歐 ‘Europe’: OO.syuu ‘Europe’, OO.bei ‘Europe and America’
- b. 王 ‘king’ : oo.sa.MA ‘king’, oo.ZYO ‘princess’

(28) /yuu/

- a. 夕 ‘evening’ : YUU.kan ‘evening newspaper’, yuu.SYO.ku ‘evening meal’
- b. 友 ‘friend’ : yuu.ZIN ‘friend’, yuu.ZYOO ‘friendship’

(29) /wai/

- a. 賄 ‘treasure’ : WAI.ro ‘bribe’
- b. 猥 ‘ribaldry’ : wai.DAN ‘obscene joke’

It is not clear why SJ morphemes of the phonemic forms /kyuu/ in (23) and /ee/ in (24) exhibit such a drastic tonal asymmetry, but it may not be so unrealistic to suppose that the tonal pattern of the alphabetic letter *Q* /kyuu/ was influenced by that of SJ morphemes with the same phonemic form. This said, one naturally wonders why the alphabetic letter *A* was not affected by the asymmetrical tonal behavior of SJ morphemes illustrated in (24). This tonal difference between the alphabetic letters *A* and *Q* can probably attributed to the fact that SJ morphemes with the phonemic form /kyuu/ overwhelm those with the form /ee/ both in number and in productivity. /kyuu/ morphemes in the SJ stratum are actually twice as numerous as /ee/ morphemes in the same stratum and produce much more compounds than the latter.

This possible influence of SJ morphemes on the tonal pattern of the alphabetic letter *Q* is in line with the view expressed in section 5.3 above, namely, that the exceptional but productive tonal behavior of monosyllabic alphabetic letters itself may be attributed to the influence of SJ morphemes. If the tonal pattern of SJ morphemes influences that of alphabetic letters, as I claim it does here, it will be an interesting case for the phonological (tonal) interaction between different lexical strata in Japanese. This possibility needs to be explored in detail in the future.

6. CONCLUSION

In this paper we examined the tonal behavior of English alphabetic letters in Kagoshima Japanese. We looked at the tone of alphabetic acronyms such as *OL* and *NHK* in one experiment and the tone of words and phrases beginning with an alphabetic letter in a second experiment. These experiments have shown that the tone of alphabetic letters

can actually be predicted from syllable structure. Most monosyllabic alphabetic letters such as *A* and *P* yield the Tone B pattern, and so do words and phrases (including acronyms) that begin with such a monosyllabic letter. Polysyllabic letters and words/phrases beginning with such a letter invariably take Tone A.

We went further to ask why there is such a clear correlation between syllable structure and tone in this dialect. We specifically asked why monosyllabic alphabetic letters give rise to Tone B despite the fact that loanwords are generally pronounced with Tone A. We proposed two factors that are potentially responsible for this peculiar behavior of monosyllabic alphabetic letters. One is a tonal uniformity which will reveal itself when a high tone is calculated from the beginning of the word/phrase. Thus, /ee-gu.MI/ 'Class A' and /e.mu-GU.mi/ 'Class M' both have a high tone on the third syllable from the beginning of the word although they show Tone B and Tone A, respectively, according to the traditional tonal analysis of the dialect. The other factor that has been suggested is an influence of SJ morphemes on the tone of alphabetic letters. It was pointed out that monosyllabic SJ morphemes in Kagoshima Japanese tend to behave as Tone B morphemes if they contain a long vowel. Since most monosyllabic alphabetic letters such as *B*, *C* and *E* contain a long vowel too, they may well have been tonally influenced by SJ morphemes of the same phonological structure.

In the final part of this paper, we considered reasons for exceptional cases, or the cases where *Q*, *V* and *Y* almost invariably take Tone A although they are monosyllabic themselves. As for *V* and *Y*, we proposed that monosyllables with a diphthong may well behave more like polysyllabic forms than do those with a long vowel. This idea is independently motivated in that syllables with a diphthong tend to pattern with a sequence of two light syllables in tonal assignment in music. The exceptional tonal behavior of *Q*, on the other hand, can probably be attributed to an influence of SJ morphemes of the same phonemic form, i.e. /kyuu/, which all exhibit Tone A rather than Tone B. Here, again, an influence of SJ morphemes on foreign morphemes has been suggested.

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NOTES

1. Since native morphemes are basically a string of consonant-vowel sequences, moras coincide with syllables in this type of lexical stratum.
2. Bisyllabic Class 4 and Class 5 nouns in Kyoto can be readily distinguished from each other when a particle is attached. Class 4 nouns are pronounced with _____ pattern, while Class 5 nouns are pronounced with _____ pattern.
3. This dataset of 80 words is the same as the set of test words used in Kubozono (2003b), who examined the accent patterns of alphabetic acronyms in Tokyo Japanese.

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Appendix : List of Alphabetic Acronyms Used in Experiment 1

Word \ First element	Monosyllabic	Bisyllabic	Trisyllabic
Two-letter word (42 words)	AB, AO, AP, BS, CM, CT, DH, DJ, ET, EU, GM, IQ, IT, JA, JR, JT, OL, ON, OS, PC, PK, PL, PM, PR, QP, TC, UN, YS (28 words)	FA, FM, HB, LL (classroom), LL (size of clothes), LP, MD, NG,, SF, SL, SM, SP (12 words)	WC, XP (2 words)
Three-letter word (38 words)	AFS, AGF, ASL, ATM, BGM, BMW, CIA, CPU, DDI, DNA, ESP, GHO, IBM, IHI, IPA, IRA, JCB, KGB, OCP, OHP, PPM, PTA, QQR, TDK, TDL, USA, USJ, VHS, VTR, YKK (30 words)	FBI, MRI, NGO, NHK, NKK, NTT, SOS (7 words)	WHO (1 word)