

Word-level vs. sentence-level prosody in Koshikijima Japanese*

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Abstract

This paper discusses the phonology of tone in Koshikijima Japanese, an endangered dialect spoken on the Koshikijima Islands in the south of Japan. Particularly interesting is the relationship between word-level and sentence-level phonology, as well as the interaction between the mora and the syllable.

Separated by the sea from its neighboring dialects, Koshikijima Japanese has developed a unique prosodic system. Like its neighbors, it has a two-pattern system, where every word takes either of two tonal patterns, Type A and Type B. Unlike its neighbors, however, both tonal types can have two pitch peaks, or two high tones (Hs): Type A has a $H_1L_1H_2L_2$ pattern, whereas Type B has a $H_1L_1H_2$ pattern. Interestingly, the first two tones of each pattern (H_1L_1) are associated with words on the basis of the syllable, while the remaining tones (H_2L_2 or H_2) are linked with particular moras. At the word level, the domain of the first high tone (H_1) can be computed only after the position of the second high tone (H_2) is determined, indicating that H_2 phonologically dominates H_1 . However, this dominance relationship is reversed at the sentence level, where H_2 undergoes deletion everywhere except in the sentence-final position. This paper discusses this paradoxical relationship between word-level and sentence-level tonal patterns and other related issues.

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1. Introduction

This paper discusses the phonology of tone in Koshikijima Japanese, an endangered dialect spoken in the south of Japan, on the Koshikijima Islands off the coast of Kagoshima. This dialect is of linguistic importance not only because it is an endangered dialect with estimated 3,000 native speakers, but also because its prosodic system remains largely undocumented and unstudied. In fact, the only substantial work on this topic is the two short papers by Takaji Kamimura (Kamimura 1937, 1941), which we will review and compare with our data in section 4.4. This paper reports on the results of some recent field-work on this endangered dialect of Japanese. We focus on the following questions: (i) how and how much two sister dialects – Kagoshima and Koshikijima Japanese – can differ prosodically if they are separated by the sea, (ii) how intricately the two prosodic units – the mora and the syllable – can be related with each other in the same prosodic system, (iii) why certain prosodic asymmetries occur in Koshikijima Japanese, and (iv) how word-level prosody is different from sentence-level prosody in the same prosodic system.

The Koshikijima Islands, consisting of three small islands, are located about 40 km off the mainland of Kagoshima. They consist of over ten villages each of which has twenty to one thousand inhabitants. This paper is based on field-work conducted in Teuchi in 2005–2008. Teuchi is the second biggest village, located at the southern edge of the southernmost island, with about 900 inhabitants. The main data were obtained from middle-aged speakers (about fifty years old) in the village.

This paper consists of four sections. In the second section (Section 2), we will demonstrate the crucial similarities and differences observed between Koshikijima Japanese and its neighboring dialect, Kagoshima Japanese. Section 3 describes the peculiar behavior that the endangered dialect exhibits with respect to the mora and the syllable, both of which are indispensable for the description of its prosodic system. Section 4 expands the scope to sentence-level prosody, where words and phrases exhibit different prosodic patterns between sentence-medial and sentence-final positions: they display two High tones – H_1 and H_2 – in sentence-final position, whereas they undergo H_2 deletion in non-final position. This gives rise to an interesting case, where H_2 dominates H_1 in word-level phonology but undergoes deletion in sentence-level phonology. The final section (Section 5) summarizes the main points and identifies some major issues that remain for future work.

2. Basic prosodic structures

2.1. Two-pattern system

The most basic prosodic feature that characterizes Koshikijima Japanese is that it has a two-pattern system, a prosodic system that has only two tonal patterns regardless of the length of the word or its syntactic category (e.g. nouns, verbs). This feature is shared by its neighboring dialects, Kagoshima Japanese and Nagasaki Japanese, which are assumed to be its sister dialects (Hirayama 1951; Shibatani 1990; Kibe 2000; Kubozono 2004, 2007, 2010, 2011; Sakaguchi 2001). Koshikijima Japanese is particularly similar to Kagoshima Japanese as regards the phonological shape of the two tonal patterns: Type A and Type B.¹ Type A exhibits a High-Low (HL) tone sequence in word/morpheme-final position, whereas Type B involves only a H tone in the final position. Moreover, these two prosodic patterns are largely lexical in both dialects, that is, it is basically impossible to predict which morpheme exhibits which prosodic pattern.² It is impossible to explain, for example, why /natu/ ‘summer’ and /huyu/ ‘winter’ /haru/ belong to Type A, whereas /haru/ ‘spring’ and /aki/ ‘autumn’ belong to Type B.³ Furthermore, there is a high degree of agreement between the two dialects as to the lexical association of morphemes with tonal patterns, so that most Type A morphemes in Koshikijima belong to Type A in Kagoshima, whereas most Type B morphemes in Koshikijima belong to Type B in Kagoshima. These basic facts indicate that the two dialects are historically closely related with each other.

Yet, the two-pattern system of Koshikijima Japanese is different from that of Kagoshima Japanese in that it has two high tones in both of the two tonal patterns (Type A and Type B). In the framework of autosegmental phonology (Goldsmith 1976; Haraguchi 1977), Koshikijima Japanese has a HLHL ‘melody’ or pattern for Type A and a HLH pattern for Type B, whereas Kagoshima

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1. Koshikijima Japanese is much closer to Kagoshima than to Nagasaki not only geographically, but also in terms of the basic tonal shapes of words and phrases. In Nagasaki, the initial two moras are high toned in Type A, whereas the final mora is high toned in Type B (Sakaguchi 2001). In Koshikijima and Kagoshima, on the other hand, a high tone appears in the penultimate position in Type A and in the final position in Type B.
 2. There are quite a few minimal pairs of words that are distinguished tonally, e.g. /ame/ ‘candy’, /too/ ‘ten’, /hana/ ‘nose’, /kanzyoo/ ‘emotion’ (Type A) vs. /ame/ ‘rain’, /too/ ‘tower’, /hana/ ‘flower’, /kanzyoo/ ‘calculation, counting’ (Type B), to mention just a few.
 3. This said, it must be added that loanwords, particularly those borrowed recently, show a strong bias towards Type A in both Kagoshima and Koshikijima Japanese. This is compatible with the fact that loanwords tend to take a falling pitch pattern across Japanese dialects (Kubozono 2006, 2008).

Japanese has LHL and LH patterns.⁴ In phonetic terms, Koshikijima Japanese can exhibit two pitch peaks within a word. This is exemplified in (1). In (1) and the rest of this paper, high-toned syllables/moras⁵ are denoted by capital letters, while syllable boundaries are indicated by dots. Disyllabic or shorter words exhibit only one pitch peak, as will be discussed shortly below.

(1)

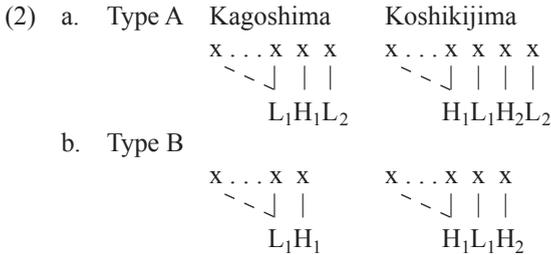
	Kagoshima	Koshikijima	Gloss
Type A	LHL#	HLHL#	
	a.ma.ZA.ke	A.ma.ZA.ke	sweet <i>sake</i>
	na.tu.ya.SU.mi	NA.TU.ya.SU.mi	summer holiday
	a.me.ma.TU.ri	A.ME.ma.TU.ri	candy festival
	ma.ku.do.na.RU.do	MA.KU.DO.na.RU.do	McDonald's
Type B	LH#	HLH#	
	o.to.KO	O.to.KO	man
	a.sa.ga.O	A.SA.ga.O	morning glory
	ha.ru.ya.su.MI	HA.RU.YA.su.MI	spring holiday
	a.me.ma.tu.RI	A.ME.MA.tu.RI	rain festival

The tonal shapes of words in (1) can be accounted for by the tonal associations illustrated in (2), where the relevant pattern is assigned from right to left in both Type A and Type B words. In Type A in Kagoshima, for example, L₂ of the L₁H₁L₂ pattern is associated with the word-final syllable, H₁ is linked with the penultimate syllable, and L₁ is associated with the remaining syllables at the beginning of the word. Koshikijima Japanese is different from Kagoshima only in involving an extra H tone (H₁) before L₁, which spreads over several

4. This analysis does not mean that H and L tones should be treated in the same way. As will be made clear in the course of discussion, the position of H tones is directly relevant for determining the overall prosodic structure in both systems (cf. Yoshida 1999).

5. In Japanese, moras can be divided into two groups, those that can constitute a syllable on their own and those that cannot. The latter group, which we call 'non-syllabic moras' in this paper (Kubozono 1989), includes the moraic nasal, the moraic obstruent (or the second half of a geminate consonant), the second half of a long vowel and the second half of a diphthong ([ai], [oi] or [ui]). Thus, /too.kyoo/ 'Tokyo', /ron.don/ 'London' and /nis.san/ 'Nissan' are all disyllabic words consisting of four moras. See Kubozono (1999, 2004) for more details about the phonological behavior and status of the syllable and the mora in Japanese.

syllables at the beginning of the word.⁶ The two dialects show essentially the same difference in Type B words, too, as shown in (2b).



A comparison between (2a) and (2b) shows that Type A and Type B differ only in the presence or absence of the final L tone (L₂) in both dialects. What this means is that the position of the H tone before this final L is distinctive in both Kagoshima and Koshikijima.⁷

The tonal assignment looks a little more complex in shorter words. Disyllabic words, for example, are apparently not long enough to implement the L₁H₁L₂ pattern in Kagoshima or the H₁L₁H₂L₂ pattern in Koshikijima. The essential rule in such cases is that tones are linked from right to left in the same way as in longer words, but any remaining tones remain unlinked with the phonological material.⁸ This is illustrated in (3). To take the A-type morpheme /na.tu/ ‘summer’, for example, both dialects assign HL to this word, with the initial L (Kagoshima) or HL (Koshikijima) in the basic pattern left unlinked with any phonological material in the word.

(3)

	Kagoshima	Koshikijima	Gloss
Type A	(L ₁)H ₁ L ₂ #	(H ₁ L ₁)H ₂ L ₂ #	
	TOo	TOo	ten
	A.me	A.me	candy
	NA.tu	NA.tu	summer

6. Kamimura (1937, 1941) reports a different pattern for the domain of this first H tone. This will be discussed in section 4.4.

7. A reviewer suggests that LH and HLH are the only permitted basic tonal patterns in the two dialects, respectively, i.e., that the difference between Type A and Type B can be attributed to the landing site of the basic (H)LH patterns.

8. See Goldsmith’s (1976) and Haraguchi’s (1977) association conventions, which allow for this possibility.

Type B	$(L_1)H_1\#$	$(H_1)L_1H_2\#$	
	TOO	toO	tower
	IN	iN	dog
	a.ME	a.ME	rain
	ha.RU	ha.RU	spring

Monosyllabic words exhibit some interesting patterns in both dialects. In Kagoshima, bimoraic monosyllables are realized with a falling pitch (HL) in Type A, and with a flat pitch (H) in Type B: e.g. /TOo/⁹ ‘ten’ vs. /TOO/ ‘tower’. This contrast is maintained in monomoraic words, too, where Type A and Type B take a falling and flat pattern, respectively: /hi/ ‘sunlight’ vs. /hī/ ‘fire’. In terms of tonal assignment, this means that the initial L tones of the basic patterns ($\underline{L}_1H_1L_2$ and \underline{L}_1H_1) remain unlinked and consequently unrealized in both tonal types. These facts indicate that the distinctive features of the two tonal patterns are HL (Type A) and H (Type B), while the initial L tones in both tonal types are quite redundant in the system. In phonetic terms, this means that the two tonal types differ solely in the presence or absence of a pitch fall.

Koshikijima Japanese exhibits somewhat different patterns from Kagoshima in monosyllabic words. In this system, bimoraic monosyllables show a contrast between falling (HL) and rising (LH) patterns: /TOo/ ‘ten’ vs. /toO/ ‘tower’. The rising pattern for Type B is different from the flat pattern (H) for the same tonal type in Kagoshima, which can be attributed to the fact we will see in section 2.3 below; that is, unlike Kagoshima Japanese, Koshikijima Japanese has a mora-based system, where H_2 and L_2 are generally realized mora by mora rather than syllable by syllable. Furthermore, Koshikijima is different from Kagoshima in that the tonal contrast is not preserved in monomoraic words. This endangered dialect somehow neutralizes the two tonal patterns completely in monomoraic words like /hi/ ‘sunlight’ and /hi/ ‘fire’.

2.2. Compound accent rule

It was pointed out in the preceding section that the choice of Type A or Type B for every morpheme is basically arbitrary. However, this does not apply to compound expressions. On the contrary, the prosody of compound words and

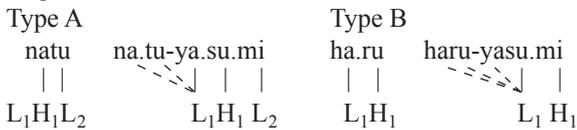
9. In this type of word, tones are apparently assigned on a moraic rather than syllabic basis, but this is due to the lack of sufficient phonological material in the word to which tones are associated.

phrases is governed by so-called Hirayama's Law in (4), which is widely observed in the two-pattern systems in the south of Japan (Hirayama 1951).

- (4) Compound words/phrases inherit the tonal pattern of their initial morpheme¹⁰

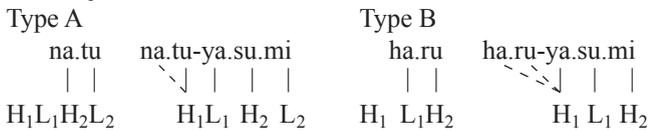
According to this law, the basic tonal pattern of the compound-initial morpheme is associated with the whole compound from right to left in the fashion described above. For example, every compound expression beginning with the Type A morpheme /na.tu/ 'summer' takes Type A, with the L₁H₁L₂ and H₁L₁H₂L₂ patterns assigned to the compound expression in Kagoshima and Koshikijima, respectively. Similarly, every compound expression beginning with the Type B morpheme /ha.ru/ 'spring' takes a L₁H₁ pattern in Kagoshima and a H₁L₁H₂ pattern in Koshikijima. This is illustrated and exemplified in (5) and (6) for Kagoshima and in (7) and (8) for Koshikijima. Hyphens indicate morpheme boundaries.

- (5) Kagoshima



- (6) a. NA.tu 'summer'
na.TU-ga 'summer-NOM'
na.tu-FU.ku 'summer clothes'
na.tu-ya.SU.mi 'summer holiday'
na.tu-ya.su.mi-KA.ra 'from the summer holiday'
- b. ha.RU 'spring'
ha.ru-GA 'spring-NOM'
ha.ru-fu.KU 'spring clothes'
ha.ru-ya.su.MI 'spring holiday'
ha.ru-ya.su.mi-ka.RA 'from the spring holiday'

- (7) Koshikijima



- (8) a. NA.tu 'summer'
na.TU-ga 'summer-NOM'

10. A similar compound tone rule is reported for Shanghai Chinese (Hung 1989).

- NA.tu-FU.ku ‘summer clothes’
 NA.TU-ya.SU.mi ‘summer holiday’
 NA.TU-YA.SU.mi-KA.ra ‘from the summer holiday’
- b. ha.RU ‘spring’
 HA.ru-GA ‘spring-NOM’
 HA.RU-fu.KU ‘spring clothes’
 HA.RU-YA.su.MI ‘spring holiday’
 HA.RU-YA.SU.MI-ka.RA ‘from the spring holiday’

Compound phrases exemplified in (6) and (8) correspond to so-called ‘bunsetsu’, or sequences consisting of a content word and one or more particles. Since this syntactic unit represents the maximal size of prosodic words for tonal assignment sketched in (2) above, we will use the term ‘lexical’, ‘word level’ or ‘word domain’ (as opposed to sentence level/domain) in the rest of this paper to refer to the level/domain where the prosodic word is defined.

It may be worth adding here that the tonal associations are independent of (a) word types – native Japanese, Sino-Japanese and foreign – and (b) word/phrase-internal compositions as well as (c) the syntactic category of the word. (9) and (10) show A-type and B-type words, respectively, all consisting of four monomoraic syllables. Words in (9) take a $H_1L_1H_2L_2$ pattern, whereas those in (10) take a $H_1L_1H_2$ pattern (/-/ in (9b) and (10b) denotes a morpheme boundary).

- (9) a. KE.da.MO.no ‘wild animal’ (native)
 TO.ku.BE.tu ‘special (status)’ (Sino-Japanese)
 BU.ra.ZI.ru ‘Brazil’ (foreign)
- b. A.ma-ZA.ke ‘sweet *sake*’
 KO-ga.TA.na ‘penknife’
 KI.mi.GA-yo ‘Kimigayo, the Japanese national anthem’
- c. KE.da.MO.no ‘wild animal’ (noun)
 HA.ta.RA.ku ‘to work’ (verb)
 U.ru.SA.ka ‘noisy’ (adjective)
- (10) a. A.SA.ga.O ‘morning glory (flower)’ (native)
 GA.KU.se.TU ‘theory’ (Sino-Japanese)
 A.ME.ri.KA ‘America’ (foreign)
- b. YA.MA-ne.KO ‘wildcat’
 O-NI.gi.RI ‘rice ball’
 KA.SE.gi-TE ‘bread winner’
- c. A.SA.ga.O ‘morning glory’ (noun)
 SI.RA.be.RU ‘to examine’ (verb)
 SA.BI.si.KA ‘lonely’ (adjective)

3. Mora vs. syllable

So far, Koshikijima Japanese is different from its sister dialect of Kagoshima only in the basic tonal patterns: it additionally involves an initial H tone in both Type A and Type B. However, the two dialects exhibit a crucial difference with respect to the prosodic units they employ. The prosodic system of Kagoshima Japanese is quite simple in this respect as it consistently uses the syllable for tonal assignment. This is shown in (11), where H and L tones are assigned syllable by syllable.

- (11) Kagoshima
- a. Type A ($L_1H_1L_2$)
 - ke.da.MO.no ‘wild animal’
 - ke.DA.mon ‘wild animal (colloquial)’
 - e.fu.BII.ai ‘FBI’
 - ke.da.MON-ga ‘wild animal-NOM’
 - BA.ree ‘volleyball’
 - b. Type B (L_1H_1)
 - mi.KAN ‘orange’
 - ni.wa.to.RI ‘chicken’
 - ni.wa.TOI ‘chicken (colloquial)’
 - ni.wa.toi-GA ‘chicken-NOM’
 - sen.SEI ‘teacher’

Koshikijima Japanese is more complex since it relies on the mora as well as the syllable. Recall that this dialect has the tonal patterns $H_1L_1H_2L_2$ (Type A) and $H_1L_1H_2$ (Type B). Specifically, it assigns the initial HL tones (H_1L_1) in both Type A and Type B on the basis of the syllable, but the remaining tones – H_2L_2 (Type A) and H_2 (Type B) – are assigned on the basis of the mora. This is illustrated in (12), which should be compared with the data of Kagoshima given in (11). Typical F₀ contours of /NI.WA.toI/ and /NI.WA.toi-GA/ in (12b) pronounced in isolation are shown in Figure 1.

- (12) a. Type A ($H_1L_1H_2L_2$)
 - KE.da.MO.no ‘wild animal’
 - KE.da.MOn ‘wild animal (colloquial)’
 - E.FU.bii.Ai ‘FBI’
 - PII.tii.Ee ‘PTA’
 - ba.REe ‘volleyball’
 - A.KA.sin.GOO ‘red signal’
- b. Type B ($H_1L_1H_2$)
 - MI.kaN ‘orange’
 - NI.WA.to.RI ‘chicken’

NI.WA.toi 'chicken (colloquial)'
 NI.WA.toi-GA 'chicken-NOM'
 SEN.sei 'teacher'
 SEN.sei-GA 'teacher-NOM'
 A.O.SIN.goO 'green signal'

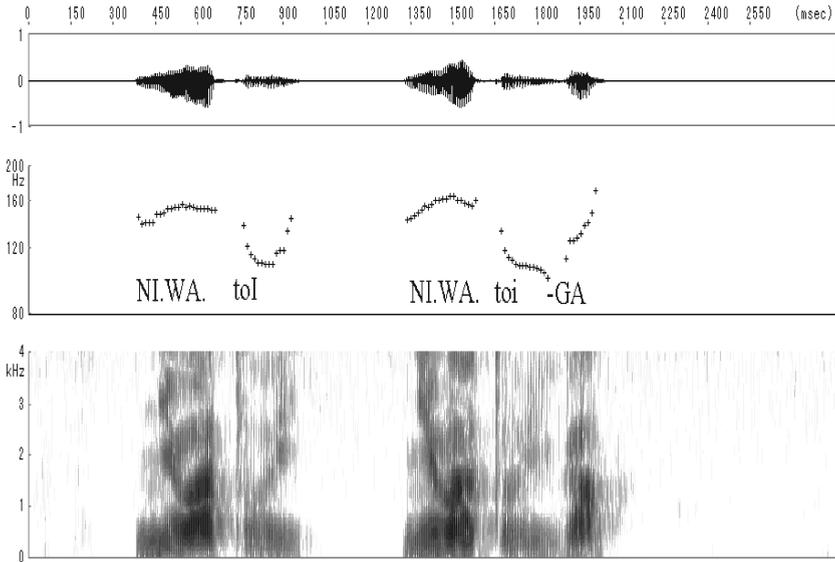


Figure 1. Typical F0 contours of /NI.WA.toi/ 'chicken' and /NI.WA.toi-GA/ 'chicken-NOM' (Type B).

In /E.FU.bii.Ai / in (12a), for example, the final L tone of the basic pattern, i.e. L_2 in $H_1L_1H_2L_2$, is realized on the second mora of the final heavy syllable, and its preceding H tone (H_2) on the first mora of the same syllable. In contrast, L_1 is associated with the syllable immediately preceding it, with the initial H tone (H_1) subsequently linked with all other syllables at the beginning of the word. Type B words undergo essentially the same tonal assignment, as illustrated in (12b), whereby the final H tone (H_2) is associated with the final mora of the word, whether or not it constitutes a syllable on its own, L_1 is linked with a syllable or syllable-sized unit immediately preceding it, and H_1 with the remaining syllables at the beginning of the word. This process of tonal assignment is shown in (13a–b) for Type A and Type B, respectively.

- (13) a. e.fu.bii.a i b. ni.wa.toi-ga
 \ \ | | | \ \ | | |
 H₁L₁H₂L₂ H₁ L₁ H₂

Note that L_1 is associated with one and only one syllable in both tonal types.¹¹ Using both the mora and the syllable in this way, the tonal assignment in Koshikijima seems sufficiently complicated. However, it becomes more complicated if one considers a H tone shift that occurs in Type A words. If Type A words end in a sequence of a heavy syllable followed by a light syllable, then the second H tone (H_2) in the $H_1L_1H_2L_2$ pattern is not associated with the penultimate mora, but rather, it is linked with one mora to the left.¹² In other words, the H tone in question cannot be linked with any ‘non-syllabic mora’ (Kubozono 1989), or the second mora of a heavy syllable, due probably to a constraint prohibiting any segments other than a syllable nucleus from becoming the peak of the word. This is exemplified in (14) and schematically shown in (15).

- (14) PUu.ru, *pu.U.ru ‘pool’
 PAn.tu, *pa.N.tu ‘pants’
 RAi.to, *raI.to ‘right, light’
 KE.da.MOn.ga, *KEDA.moN-ga ‘wild animal-NOM’
 ba.REe-ga, *BA.reE-ga ‘volleyball-NOM’

- (15) a. $\begin{array}{c} * \quad \sigma \quad \sigma \\ \quad \wedge \quad | \\ \quad \mu \quad \mu \quad \mu \\ \quad | \quad | \quad | \\ H_1L_1H_2L_2 \end{array}$ b. $\begin{array}{c} \quad \sigma \quad \sigma \\ \quad \wedge \quad | \\ \quad \mu \quad \mu \quad \mu \\ \quad | \quad \diagdown \quad | \\ H_1L_1H_2 \quad L_2 \end{array}$

It must be noted here that unlike Type A words, Type B words freely allow their second H tone to be linked with the second mora of a heavy syllable, e.g. MI.kaN ‘orange’, NI.WA.toI ‘chicken’ in (12b), apparently violating the constraint mentioned above. This yields an asymmetry between the two tonal types with respect to the capability of non-syllabic moras to bear the second H tone in the basic patterns: non-syllabic moras can be linked with the second H tone in Type B, but not in Type A. This interesting asymmetry may be accounted for if one considers the possibility of merger, i.e. neutralization of the two tonal types in the system. If the H tone shift should occur in Type B

11. An exceptional pattern is observed in four-mora or five-mora Type A words that begin with a heavy syllable. These words exceptionally allow the two H tones to be adjacent to each other: e.g. /RON.DON/ ‘London’, /PII.KEI/ ‘PK, penalty kick’, /TON.NE.ru/ ‘tunnel’, /SAI.BO.o.gu/ ‘cyborg’, /KAN.ZY.O.o/ ‘emotion’, /NII.SAN/ ‘elder brother’ (vs. /ba.REE/ ‘volleyball’, /zi.KAN/ ‘time’).

12. Essentially the same type of H tone shift occurs in Tokyo Japanese. In this dialect, non-syllabic moras cannot bear a lexical pitch accent, or the H tone immediately before a L tone. If the lexical accent is assigned to a non-syllabic mora by rule, it invariably shifts one mora to the left, i.e. to the syllabic mora of the relevant syllable: e.g. */roN.don/ → /RON.don/ ‘London’; */saI.daa/ → /SAI.daa/ ‘lemonade’, */saK.ku.su/ → /SAK.ku.su/ ‘sax’ (McCawley 1968).

words just as it does in Type A words, the two tonal patterns would be neutralized in all words and phrases ending in a heavy syllable. For example, the Type B word /MI.kaN/ ‘orange’ would be pronounced as /mi.KAn/, which would be indistinguishable from its Type A counterpart, e.g. /zi.KAn/ ‘time’. /NI.WA.toI/ ‘chicken’ would also become tonally indistinguishable from its Type A counterpart, e.g. /KE.da.MOn/ ‘wild animal’.

It may be argued here that tonal neutralization could have been avoided by not having the H tone shift rule at all in Type A.¹³ This strategy does certainly help to keep the tonal contrast at the word level, e.g. /puU.ru/ ‘pool’ (Type A) vs. /TOo.FU/ ‘bean curd’ (Type B), but it leads to tonal neutralization at the sentence level, due to the H₂ deletion process to be discussed in section 4 below. For example, /ke.da.mon-ga/ ‘wild animal-NOM’ (Type A) and /ni.wa.toi-ga/ ‘chicken-NOM’ (Type B) would become tonally indistinguishable at the sentence level if H tone shift should not occur in the former: /KE.DA.moN-ga/ → /KE.DA.mon-ga/ vs. /NI.WA.toi-GA/ → /NI.WA.toi-ga/.

Seen in this light, the asymmetry in question can be attributed to a force to avoid tonal neutralization in the two-pattern system. Another argument for positing such a force will be presented in section 4.4 below.

4. Word-level vs. sentence-level prosody in Koshikijima Japanese

4.1. Phonological dominance

The foregoing discussion has clarified some peculiarities in the two-pattern system of Koshikijima Japanese, which are not shared by the two-pattern system of Kagoshima Japanese. First, the Koshikijima system has two H tones rather than one in the basic patterns: H₁L₁H₂L₂ (Type A) and H₁L₁H₂ (Type B). In both tonal types, both H₁ and H₂ are linked with phonological materials in three-mora or longer words. Second, H₁ and H₂ are usually separated by a L tone (L₁), which is associated with a single syllable (see footnote 11 above for an exceptional case). Third, and most interestingly, H₁ and H₂ are assigned in different ways: H₂ is associated with a particular mora, while H₁ is assigned to one or more syllables at the beginning of the word.

Despite these peculiarities, Koshikijima Japanese is identical to its sister dialect of Kagoshima in assigning the basic tonal patterns from the right edge of the word. What this means in Koshikijima Japanese is that the domain of H₁ can be determined only after the position of H₂ has been determined. This can be seen very clearly from the examples in (16) and (17), both of which compare the prosody of a phrase with that of its colloquial form.

13. I thank Jeroen van de Weijer for pointing out this possibility.

- (16) Type A
 - a. KE.DA.mo.NO-ga ‘animal-NOM’
 - b. KE.da.MOn-ga ‘animal-NOM (colloquial)’
- (17) Type B
 - a. NI.WA.TO.ri-GA ‘chicken-NOM’
 - b. NI.WA.toi-GA ‘chicken-NOM (colloquial)’

H₂ is assigned to /NO/ in (16a) but to /MO/ in (16b) since the penultimate mora in the latter is the second mora of a heavy syllable. This difference yields a difference in the position of L₁: /mo/ in (16a) vs. /da/ in (16b). This, in turn, gives rise to a difference in the domain of H₁: /KE.DA/ in (16a) vs. /KE/ in (16b). Seen conversely, the domain of H₁ cannot be defined unless one looks ahead towards the end of the relevant phrase.

This is essentially true of (17), too, where H₁ spreads over the first three syllables in (17a) but over the first two syllables in its colloquial form in (17b). This difference reflects the fact that the penultimate syllable, which is L toned, is /ri/ and /toi/, respectively. In this case, too, the domain of H₁ can be computed only after the position of H₂ is determined. This whole process of tonal assignment can be understood very well if it is described in a derivational way, as shown in (18).¹⁴

- (18) a. Type A

Input	ke.da.mo.no-ga] _A	ke.da.mon-ga] _A
Step 1 (H ₂ determined)	ke.da.mo.NO-ga	(ke.da.moN-ga→) ke.da.MOn-ga
Step 2 (H ₁ determined)	KE.DA.mo.NO-ga	KE.da.MOn-ga

- b. Type B

Input	ni.wa.to.ri-ga] _B	ni.wa.toi-ga] _B
Step 1 (H ₂ determined)	ni.wa.to.ri-GA	ni.wa.toi-GA
Step 2 (H ₁ determined)	NI.WA.TO.ri-GA	NI.WA.toi-GA

In sum, H₁ occurs concomitantly with H₂ in Koshikijima Japanese. H₂ is primarily responsible for the lexical distinction between Type A and Type B, while H₁ signals this distinction only redundantly. This point turns out to be very crucial when we compare word-level and sentence-level forms in the next section.

14.]_A and]_B mean that the word/phrase belongs to Type A or Type B, respectively.

4.2. *H tone deletion*

So far, we have restricted our discussion to the prosody of words and phrases when they are pronounced in isolation, i.e. as a one-word/phrase sentence. The situation becomes more complicated if one examines how words and phrases are pronounced within a sentence. In sentence-level phonology, each phrase can have only one peak except in sentence-final position.¹⁵ In other words, one of the two H tones must undergo deletion in sentence-medial position. Surprisingly, it is always the second H tone (H_2) that is the target of deletion.¹⁶ This H tone deletion process is described in (19)–(20), where the mora affected by this process is underlined. (21) schematically shows this process, whereas Figure 2

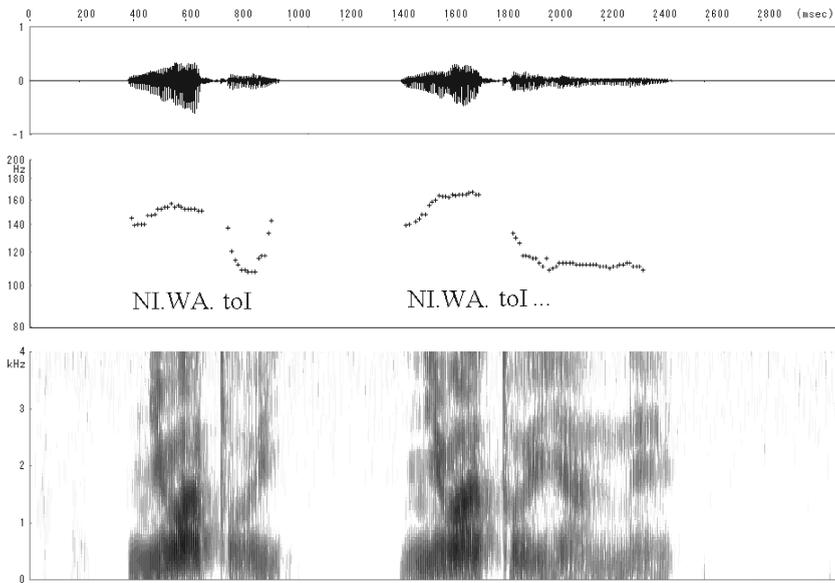


Figure 2. Typical F0 contours of /NI.WA.toI/ 'chicken' in two positions, sentence-final and non-final.

-
15. A reviewer asks whether this positional distinction is based on the sentence or the utterance. We tentatively generalize the data here on the basis of the sentence since H tone deletion seems to readily occur in utterance-final phrases involving a long pause or hesitation.
16. A single-peak phrase remains intact, i.e. keeps its sole peak, in any context. Thus, /a.ME-ga/ 'candy-NOM' and /me-GA/ 'eye-NOM' do not undergo H tone deletion even if followed by another phrase in a sentence: /a.ME-ga # yo.KA/ 'The candy is good', /me.GA # yo.KA/ 'The eye is good. (He) has a good eyesight'.

compares the F0 patterns of the Type B word /NI.WA.toi/ in final and non-final positions.

(19) Type A

a. /ke.da.mo.no/ vs. /ke.da.mon/ ‘animal’

Position\Input	ke.da.mo.no] _A	ke.da.mon] _A
Sentence-final	KE.da.MO.no.	KE.da.MOn.
Sentence non-final	KE.da.mo.no #yan.NEe ‘It’s an animal’	KE.da.mon #yan.NEe ‘It’s an animal’

b. /ke.da.mo.no-ga/ vs. /ke.da.mon-ga/ ‘animal-NOM’

Position\Input	ke.da.mo.no-ga] _A	ke.da.mon-ga] _A
Sentence-final	KE.DA.mo.NO-ga.	KE.da.MOn-ga.
Sentence non-final	KE.DA.mo.no-ga #yo.KA ‘(The) animal is good’	KE.da.mon-ga #yo.KA ‘(The) animal is good’

(20) B-type words

a. /ni.wa.to.ri/ vs. /ni.wa.toi/ ‘chicken’

Position\Input	ni.wa.to.ri] _B	ni.wa.toi-ga] _B
Sentence-final	NI.WA.to.RI.	NI.WA.toi.
Sentence non-final	NI.WA.to.ri #yan.NEe ‘It’s a chicken’	NI.WA.toi #yan.NEe ‘It’s a chicken’

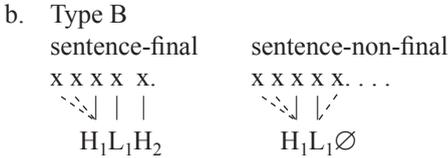
b. /ni.wa.to.ri-ga/ vs. /ni.wa.toi-ga/ ‘chicken-NOM’

Position\Input	ni.wa.to.ri-ga] _B	ni.wa.toi-ga] _B
Sentence-final	NI.WA.TO.ri-GA.	NI.WA.toi-GA.
Sentence non-final	NI.WA.TO.ri-ga #yo.KA ‘(The) chicken is good’	NI.WA.toi-ga #yo.KA ‘(The) chicken is good’

(21) High tone deletion in non-final position

a. Type A

sentence-final	sentence-non-final
x x x x x.	x x x x x. . . .
$\begin{array}{c} \diagdown \quad \quad \quad \\ H_1 L_1 H_2 L_2 \end{array}$	$\begin{array}{c} \diagdown \quad \diagdown \quad \diagdown \quad \diagdown \\ H_1 L_1 \emptyset \end{array}$



Note here that the H tone deletion process does not neutralize the two tonal patterns in non-final position. Although it is impossible to predict how many word-initial syllables are high-toned either in Type A or in Type B, as we will see shortly below, these tonal patterns nevertheless remain distinct from each other even when H_2 is absent in non-final position. As shown in (21), the domain of H_1 is one syllable longer in Type B than in Type A if all other phonological structures are identical such as word length (i.e. the number of moras) and the syllabic composition of the word. In this sense, H_1 plays a distinctive role in non-final position.

Returning to the H tone deletion process per se, this process presents a challenging case, i.e. a case of ‘opacity’ (cf. Kiparsky 1973). In word-level phonology, H_2 dominates H_1 in the sense that the domain of H_1 can be defined only with reference to the position of H_2 . In sentence-level phonology, however, H_1 dominates H_2 in that H_2 , but not H_1 , is suppressed in non-final position. In this system, the roles of H tones also change between word-level and sentence-level phonology.¹⁷ At the word level, the position of H_2 plays a distinctive role by which Type A and Type B are distinguished from each other. At the sentence level, on the other hand, the distinctive role is played by H_1 , whereas H_2 only serves as a boundary tone signaling the end of the sentence¹⁸. We will analyze this paradoxical situation in the next two subsections.

4.3. *Lexical vs. boundary tone*

The paradoxical situation in question is due primarily to the observation that H_2 is a distinctive tone at the word level but undergoes deletion at the sentence level. One way of solving this problem may be to assume that H_2 is not a lexical tone and, hence, that the peculiar rule of H tone deletion does not exist

17. We can compare this situation with rhythmic stress shift in English words, where the primary stress determines the location of a secondary stress, but undergoes deletion (or reduction) itself in stress-clash environments at the phrasal/sentence level: e.g. *Jàpanèse* vs. *Jàpanese* *péople* (Lieberman and Prince 1977). I owe this comment to Carlos Gussenhoven.

18. Other boundary tones in this dialect (and also in Kagoshima Japanese) include a sentence-final L tone for questions. This tone is simply superimposed on lexical tones and triggers pitch lowering on a lengthened final vowel in interrogative sentences: e.g. /NI.WA.to.RI/ ‘chicken?’ vs. /NI.WA.to.RI/ ‘chicken?’; /KE.da.MO.no/ ‘wild animal’ vs. /KE.da.MO.no/ ‘wild animal?’. There are no sentence-initial boundary tones in this dialect.

at all. This alternative analysis posits only H₁ as a lexical tone and assumes that H₂ is inserted as a boundary tone in sentence-final position rather than being deleted in non-final position.¹⁹ This analysis sounds quite reasonable since the sentence-final position is often a target of many phonological and/or phonetic processes across languages involving, for instance, question prosody and sentence-final lengthening. In other words, sentence-medial positions generally show a default prosodic pattern of words and phrases, which is often modified by a boundary tone in sentence-final position.

Under this analysis, the picture given in (19–21) will be reversed, and the second H tone (H₂) is inserted in sentence-final position as a boundary tone rather than being deleted in non-final position. This is illustrated in (22).

- | | | | | |
|---------|-------------|---|-------------|--|
| (22) a. | word level | | b. | sentence level (sentence-final position) |
| | (Type A) | | | |
| | KE.da.mo.no | → | KE.da.MO.no | ‘wild animal’ |
| | KE.da.mon | → | KE.da.MOn | ‘wild animal (colloquial)’ |
| | (Type B) | | | |
| | NI.WA.to.ri | → | NI.WA.to.RI | ‘chicken’ |
| | NI.WA.toi | → | NI.WA.to.I | ‘chicken (colloquial)’ |

While this analysis seems quite orthodox, it runs into several difficulties if the data are analyzed more carefully. In the first place, it needs to refer to lexical information of words in sentence-level phonology in such a way that it assigns the boundary tone, H₂, to the penultimate mora in Type A words and to the final mora in Type B words. In other words, this analysis ends up assuming that the sentence-level rule of H tone insertion is sensitive to lexical tonal distinctions.

A more serious problem with the alternative analysis in (22) is that it cannot define the domain of H₁ in a general way. The examples in (22) may suggest that H₁ is linked with the initial syllable in Type A words, /KE.da.mo.no/ and /KE.da.mon/, and with the initial two syllables in Type B words, /NI.WA.to.ri/ and /NI.WA.toi/. Alternatively, it may also be possible to generalize that H₁ is linked with the fourth mora from the end of the word and spreads leftwards in Type A, whereas it is linked with the antepenultimate mora and spreads leftwards in Type B. These generalizations, however, do not apply to many other words and phrases. Some examples are shown in (23), where sentence-final forms are given in parentheses for comparison.

- | | |
|---------|---------------------------------------|
| (23) a. | Type A |
| | SU.to.ra.i.ki (SU.to.RAi.ki) ‘strike’ |
| | PII.tii.ee (PII.tii.Ee) ‘PTA’ |

19. A reviewer has attracted my attention to this alternative analysis.

PII.E.ru.oo (PII.E.ru.Oo) ‘PLO’

KE.DA.mo.no-ga (KE.DA.mo.NO-ga) ‘wild animal-NOM’

KE.da.mon-ga (KE.da.MOn-ga) ‘wild animal-NOM (colloquial)’

b. Type B

NI.hon.sya (NI.hon.SYA) ‘Japanese car’

MI.kan-ga (MI.kan-GA) ‘orange-NOM’

NI.WA.toi-ga (NI.WA.toi-GA) ‘chicken-NOM (colloquial)’

The main reason for the failure to capture the generalization correctly is that the domain of H_1 is entirely dependent on the position of H_2 , but not vice versa. The non-final forms in (19)–(20) and (23) can therefore be determined on the basis of their corresponding sentence-final forms. This means that the analysis in (22) is wrong and that both of the two H tones in sentence-final forms are lexical tones, not boundary ones. This, in turn, supports the idea of H tone deletion in non-final position.

4.4. *Word-level and sentence-level interaction*

The preceding discussion raises a challenging and difficult question: why does H_2 delete although it is a lexically distinctive tone that defines the domain of H_1 at the word level? Although this question remains largely unsolved, it is worth considering phonological factors behind the sentence-level process by discussing how word-level prosodic structure interacts with sentence-level structure. To do this, it is vital to compare our data with the data that Kamimura (1937, 1941) presented in his report seventy years ago.²⁰

There are several crucial differences between Kamimura’s and our data. First of all, Kamimura (1937, 1941) does not mention H_2 deletion in his report, which suggests that this process is a rather new development in the prosodic system of Koshikijima Japanese. Secondly, the domain of H_1 differs between our data and Kamimura’s. In Kamimura’s data, the default location of H_1 is the second mora of the word in both A-type and B-type, and does not move or spread either to the left or to the right even in long words (Kamimura 1941: 13). In this system, H_1 is independent of H_2 and does not function to distinguish between the two tonal types. This is exemplified below.

(24) Type A

na.TU.ya.SU.mi ‘summer holiday’

mu.KA.si.ba.NA.si ‘old tale’

Type B

ha.RU.ya.su.MI ‘spring holiday’

i.RO.en.pi.TU ‘color pencil’

20. Kamimura says that his data and description cover all major villages on the Koshikijima Islands, including Teuchi, where our data were collected.

In the present-day system, in comparison, H₁ can spread over more than one syllable at the beginning of the word and, more crucially, is dependent on H₂: the two H tones are separated by one and only one low-toned syllable. As a consequence, H₁ as well as H₂ bears a distinctive role. This can be seen from the present-day counterparts of the words in (24), given in (25).

- | | | |
|------|---------------------------------|---------------------------------|
| (25) | Type A | Type B |
| | NA.TU.ya.SU.mi ‘summer holiday’ | HA.RU.YA.su.MI ‘spring holiday’ |
| | MU.KA.SI.ba.NA.si ‘old tale’ | I.RO.EN.pi.TU ‘color pencil’ |

The two crucial differences between Kamimura’s system seventy years ago and our system today are not unrelated with each other. On the contrary, they are closely tied with each other since H₂ deletion would have neutralized the two tonal patterns, Type A and Type B, in the old system as shown in (26). In other words, H₂ deletion at the sentence level could not have occurred in Kamimura’s old system because of potential tonal neutralization between the two tonal patterns. This is another piece of evidence for positing a force to avoid neutralization in the prosodic system of Koshikijima Japanese.

- (26) Hypothetical H₂ deletion in Kamimura’s system
- a. Type A
 - na.TU.ya.SU.mi → na.TU.ya.su.mi
 - mu.KA.si.ba.NA.si → mu.KA.si.ba.na.si
 - b. Type B
 - ha.RU.ya.su.MI → ha.RU.ya.su.mi
 - i.RO.en.pi.TU → i.RO.en.pi.tu

Seen in this light, it is possible to understand why the H tone deletion rule was absent in the old system but can be present in the current system.²¹ The pivotal factor that prompted this sentence-level process is the word-level change that affected the domain of H₁. While it remains unclear why H₁ has changed its domain from (24) to (25), it is clear that this word-level change was a prerequisite for the sentence-level process of H₂ deletion. This presents an interesting case showing how a word-level process can interact with a sentence-level process.

21. Note that this historical development has made the endangered system of Koshikijima Japanese more complex in terms of ‘opacity’, but simpler in terms of tonal representations: tonal representations at the sentence level are much simpler now than they were seventy years ago due to H tone deletion in non-final positions. This means that the historical development in question cannot be regarded as a counterexample to the general observation that language loss is usually accompanied by phonological simplification.

5. Conclusion

This paper discussed word-level and sentence-level prosody of the Koshikijima Japanese, one of the endangered Japanese dialects that has not been studied in depth. Like other dialects in the same geographical area, this dialect has a two-pattern prosodic system, a system with two lexically contrastive tonal patterns. We analyzed this particular dialect as having two basic tonal patterns – $H_1L_1H_2L_2$ (Type A) and $H_1L_1H_2$ (Type B) – either of which is underlyingly given to any morpheme.

In the first half of this paper, we presented an overall picture of the dialect's prosodic system, including its compound accent rule and the assignment of the basic tonal patterns to words. Particularly interesting here was the interaction between the mora and the syllable: the first two tones in the basic tonal patterns – H_1L_1 – are assigned syllable by syllable, whereas the remaining tones – $H_2(L_2)$ – are assigned on the basis of the mora. Specifically, the second H tone (H_2) in each tonal pattern is assigned to a particular mora, the L tone (L_1) preceding this H tone is associated with the immediately preceding *syllable*, and the initial H tone (H_1) is linked with the remaining *syllables* at the beginning of words. It is interesting to ask why only the final H(L) tones are quantity-sensitive.

The second half of the paper discussed the paradoxical relationship between H_1 and H_2 . At the word level, H_2 is distinctive and, moreover, determines the domain of H_1 . In this sense, H_2 dominates H_1 in the word domain. At the sentence level, however, H_2 is deleted except in sentence-final position. What this means is that at the sentence level, H_1 comes to bear a lexically distinctive role, while H_2 (if manifested) serves as a boundary tone signaling the end of the sentence. We analyzed this case from a historical point of view by comparing our data with the data that were reported some seventy years ago (Kamimura 1937, 1941). This comparison revealed an interesting interaction between word-level and sentence-level processes, suggesting that a word-level prosodic change that modified the domain of H_1 was a prerequisite for the sentence-level process by which H_2 is deleted in non-final position.

This study has revealed several interesting questions for future work in addition to those that have been pointed out above. One of them concerns the historical relationship between the prosodic system of Koshikijima and that of its sister dialect, i.e. Kagoshima. It will be very interesting to ask which system is older, that is, whether the more complex tonal patterns of the former ($H_1L_1H_2L_2$ and $H_1L_1H_2$) have developed out of the simpler patterns of the latter ($L_1H_1L_2$ and L_1H_1) or the former system has been simplified into the latter one. It will also be important to explore the functional reason(s) for the peculiar H tone deletion process discussed in section 4, especially in comparison with rhythmic stress shift in English and other stress-accent languages. Fur-

thermore, how to formulate the major tonal patterns and rules in a more theoretical framework, notably the non-derivational Optimality-theoretic framework (Prince and Smolensky 1993/2004), also remains an important issue for future research.

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