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An Attempt to Reconstruct the Accent System of Shiraho Nouns

Moriyo Shimabukuro

1. Introduction

The Shiraho dialect of Yaeyama Ryukyuan is spoken in Shiraho on the island of Ishigaki. It is known that twice in the past a large number of people on Hateruma Island were forced to move to Shiraho by the government. The first migration took place in 1713, and the second some time after the Meiwa Tsunami in 1771 (Yaeyama Rekishi Henshū Iinkai 1954:254-5) in order to prevent the village or hamlet from being deserted. Because of the history of the migration from Hateruma, it is natural to find similarities between the Shiraho and Hateruma dialects in many aspects. However, since both dialects have developed independently, they are not identical.

The main objectives of this paper are three. The first is to discuss the accentual patterns of Shiraho nouns, as analyzed in two previous studies: Sakimura (1987) and Ryūkyū Hōgen Kenkyū Kurabu (hereafter, RHKK) (2007). These studies report quite different accent systems based on their own data sources. The second purpose is to reconstruct an earlier accent system of Shiraho nouns on the basis of these sets of data, and also to account for the development of the modern Shiraho accent systems from their proto-form. The third is to make our result available for a further research goal—a reconstruction of a proto accent system of the common language from which modern Shiraho and Hateruma dialects developed—the accomplishment of which requires a reconstructed accent system of both proto Shiraho and proto Hateruma dialects.

The paper consists of three main sections. In the first section, I present my analysis of Sakimura's data on Shiraho noun accent (Sakimura 1987). In the second, I analyze the accent system of Shiraho nouns based on the data
of RHKK (RHKK 2007). The last section attempts to reconstruct an earlier form of the Shiraho accent system, and then accounts for the development of modern Shiraho accent.

2. Sakimura’s data and analysis

Sakimura’s (1987) analysis of Shiraho accent data includes monomoraic, bimoraic, and trimoraic nouns. The pitch patterns for words are given as uttered in isolation as well as when followed by the particle *ndu* ‘Subject marker’. Pitch height—whether H(igh), M(id), or L(ow)—is indicated per mora (e.g., *kay* LL ‘god’). A half-long mora indicated by * ’(e.g., *k̄t̄i* ‘wind’) tends to appear at the end of words in most cases—some words show a half mora in the initial syllable of words, e.g., *na-da* ‘tear’, *ma-mi* ‘bean’, *ja-ma* ‘mountain’, *mu-mu* ‘thing’, and *gus-sa* ‘cane’. I analyze a short vowel with a half-mora as a phonetic variant of a short vowel because it becomes short when followed by a particle, instead of lengthening the vowel. For example, *k̄t̄i* ‘wind’ is uttered as *k̄t̄i-ndu* when followed by the particle *ndu*. Throughout this paper, to indicate the pitch height of a half mora, we adopt the small cap letters H for high pitch, M for mid pitch, and L for low pitch. For instance, the phonetic pitch of *k̄t̄i* ‘wind’ is given as LHL in isolation, and LL-LL when followed by the particle *ndu*. The pitch preceded by a hyphen indicates the pitch of the particle.

According to Sakimura’s analysis, there are basically two distinctive accent classes in Shiraho: atonic and tonic accent. Words with atonic accent are generally uttered without a fall in pitch (e.g., *sita* LH ‘tongue’, *uja* LL ‘parent’ – both are LL-LL when followed by a particle). However, some atonic words consisting of a half mora at the end show a pitch fall immediately before the mora (e.g., *k̄t̄i* LHL ‘wind’). Since the half mora is neutralized when followed by a particle (e.g., *k̄t̄i-ndu* LL-LL), we consider it a phonetic variant of a short mora. Notice that atonic words show the same
pitch shape (i.e., low pitch throughout) when uttered with a particle. See (1a) and (1b).

With regard to the other accent class, tonic accent, words are basically uttered with a fall in pitch immediately after the first mora (e.g., judari HLL ‘drool’). However, a pitch fall occurs immediately after the second mora when the first mora contains a devoiced vowel (e.g., kunun LHL ‘cloud’). The phonetic pitch patterns of Shiraho nouns in isolation vary, but most nouns show a single phonetic pitch pattern when followed by a particle. Words with a devoiced vowel in the first mora show a slightly different pattern. I discuss this matter in the following sections.

(1) Overview of Shiraho accent for nouns

(a) Bimoraic nouns:

Atonic  
\[ [\text{LL}/\text{LL}-\text{LL}]^\text{a} \]
\[ [\text{LH}/\text{LH} \sim \text{LL}-\text{LL}]^\text{b} \]
Tonic  
\[ [\text{HL}/\text{HL} \sim \text{HL}-\text{LL}] \]
\[ [\text{HLM}/\text{HHL}/\text{HLH}/\text{MLH} \sim \text{HL}-\text{LL}] \]

(b) Trimoraic nouns:

Atonic  
\[ [\text{LLL}/\text{LLL}/\text{LH}/\text{LH} \sim \text{LL}-\text{LL}] \]
Tonic  
\[ [\text{HLL}/\text{HLL}/\text{HLH}/\text{MLH} \sim \text{HL}-\text{LL}, \text{LHL}/\text{LML}-\text{LL}] \]

2.1 Bimoraic noun accent

Other than the words listed in (1), there is one example of a monomoraic word, phonetically with a half mora at the end; namely 'zi: Hl. ‘blood’—it is H-Ll. when uttered with the particle ndu.

As mentioned above, there are two distinctive accent classes in Shiraho, namely, atonic and tonic. For bimoraic atonic words, there are four phonetic pitch patterns: LL, LL-L, LH, and LH-L. Examples are igi LL ‘pond’, usi LL-L.
‘mortar’, sîta LH ‘tongue’, and Futji LHL ‘mouth’. All are uttered in low pitch when followed by a particle, i.e. LL-LL. Notice that both LLl and LHL become LL-LL as well.


(2) Accentual patterns of bimoraic nouns

<table>
<thead>
<tr>
<th>Phonemic</th>
<th>Phonetic</th>
<th>Example</th>
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</table>
2.2 Trimoraic noun accent

Like bimoraic nouns, trimoraic nouns can be classified into either an atonic or falling accent class. In isolation atonic words show three basic pitch variations: LLL/LLL, LLH/LLHl, and LLHL. Examples are as follows: *huku*’zi LLL ‘trash’, *po:si* LLL ‘broom’, *supa* LLH ‘beside’, *atta* LLHl ‘tomorrow’, and *kutuba* LLHl ‘language’. Just like bimoraic atonics, they all appear with a low flat pitch when uttered with a particle.39

The pitch patterns of the falling-accent words also vary. In isolation, they are either HLL/HLLl, HLHl, HLMl, LHL, or LML. The last two remain as they are when pronounced with a particle, while the rest are in HLL-LL pitch. Here are some examples: *judadi* HLL ‘drool’, *buduri* LLLl ‘dance’, *inaga* HLHl ‘sea’, *bufama* HLMl ‘oldest brother’, *kuñun* LHL ‘cloud’, and *sikix* LML ‘moon’. Due to the fact that words with LHL or LML contain a devoiced vowel in the initial syllable/mora, they show irregular pitch patterns.
(3) Accentual patterns of trimoraic nouns

<table>
<thead>
<tr>
<th>Phonemic</th>
<th>Phonetic</th>
<th>Example</th>
</tr>
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<tbody>
<tr>
<td>LLL/LLL LLL-LLL</td>
<td>jutu· 'language', tanumi· 'favor', pikażi· 'light', hutsiri 'light', 'drum' 42, tsupaki· 'camellia', amma· 'older sister', ujağa 'parents', supağa 'beside', pitegi· 'cultivated field' 43, bubbı· 'thumb', homma· 'oldest sister'</td>
<td></td>
</tr>
<tr>
<td>HLL/LHLL LLL-LLL</td>
<td>juguşi· 'drool', managa 'garden; yard', mępá 'front', akubi 'yawn', biusi· 'cows', otta 'frog', bunari· 'sisters', huten 'forehead' 44, bigiţi· 'brothers', buduţi· 'dance', (bu)utama· 'child', kānape· 'hoo' 45, maffa· 'pillow'</td>
<td></td>
</tr>
<tr>
<td>HLL/HLL HLL-LLL</td>
<td>nači· 'flow; current', mimaiţi· 'earthworm', gužiţa· 'whale', inaga· 'sea' 46, buzasari· 'grandfather', bama· 'grandmother', finubi· 'finger', (bu)fitu· 'adult', midumov· 'female', garafţi· 'crow', maşni· 'language', gubema· 'little finger' 47, nagabi· 'middle finger', usitua· 'elder' 48, bēma· 'we' 49</td>
<td></td>
</tr>
<tr>
<td>HLM LLL-LLL</td>
<td>bujama· 'oldest brother'</td>
<td></td>
</tr>
<tr>
<td>LHL-LLL</td>
<td>kūmjụn· 'cloud' 50, kajatsi· 'shape' 51, kjpusi· 'smoke', fínusi· 'mark', haţjimi· 'beginning', pəsən· 'scissors', hašutsi 'chain' 53, təhabu· 'cigarette'</td>
<td></td>
</tr>
<tr>
<td>LML-LLL</td>
<td>sikiş· 'moon'</td>
<td></td>
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</table>

3. RHKK's data and analysis

This section provides an analysis of the accentual patterns of Shiraho nouns based on the data given in RHKK (2007). Although the data are far from comprehensive, they provide good enough information for us to obtain a clear understanding about the accent system of Shiraho nouns as a whole. The following is a discussion of bimoraic and trimoraic noun accent.

The symbols 'i', 'l', and '\n' are used to indicate the pitch shape of words 44. See the description of the pitch pattern for each symbol below. In
the data, it seems that 'ι' also indicates 'a falling pitch' when used within a long syllable. For example, the word *ma:ju:* 'eyebrow' is uttered with HLLL.55 Notice that \( \textit{ma:su:} \) 'salt' is also HLLL.

Symbols  

\( \uparrow \): Level/flat pitch (e.g., \( \textit{tpuni} \) 'boat'). Words marked with 'ι' are uttered in flat pitch or in relatively high-level pitch (RHKK 2007:60). In this paper, I describe them with high-level pitch, i.e., \( \textit{tpuni} \) HH 'boat'.

\( \downarrow \): Abrupt change in pitch from high to low between moras or syllables (e.g., \( \textit{ulfi} \) HL 'cow').

\( \nearrow \): Falling pitch within a syllable with two moras (e.g., \( \nearrow \textit{pu:} \) HL 'sail'). Note that we analyze 'a falling pitch' as consisting of a H and a L pitch.56

In the data, some words are listed with '〜' between them (e.g., \( \textit{tsi\~na} \sim \textit{tsi\~na} \sim \textit{j\~na} \) 'rope'); and others with '/' (e.g., \( \textit{tk\~ta} / \textit{tma} \) 'gap, aperture'). The former indicates that the words listed are variant forms of the same morph – compounds with the same morph are also listed as this type. The latter shows that they are made up of different morphs but listed under the same entry in the data as equivalents for a single Japanese word.

3.1 Accent of Shiraho nouns

The following is an overview of the accent system as described by RHKK for nouns as well as noun compounds or phrases. In the data there are no monomoraic words. Monosyllabic words are two morae long (2007:60). Words vary in length from bimoraic to nine morae long. All length groups contain words from the atonic accent class; words are pronounced with flat high pitch, and these groups also contain tonic types of accent where an accent
falls on one of the morae in the words. It should be pointed out that there are no words with accent on the final mora. Longer words have more distinctions in accent—there are three accent classes for bimoraic and trimoraic, four for tetramoraic, and so on.

(4) Overview of RHKK's Shiraho accent for nouns

(a) Bimoraic nouns:
   Atonic [flat]
   Initial-mora accent [HL-L]
   Penultimate-mora accent [HH-L, H-L]

(b) Trimoraic nouns:
   Atonic [flat]
   Initial-mora accent [HLL]
   Penultimate-mora accent [OHL]

In this accent system, the mora is the unit that bears an accent. This is clear from the data where a pitch change occurs between two moras within a syllable, e.g., kaːbra ‘river’ and jaːdu ‘door, lodging’. Under our mora-based analysis, words with O₁O HL-L, o₁o HL-L, and oo HL-L in isolation are treated as the same accent class.

The analysis is based on the mora, not the syllable. The reason is that a mora-based analysis provides much simpler and clearer description than a syllable-based one. For example, within a syllable-based analysis, it is hard to classify words with o₁oO and ones with ooO. By contrast, within a mora-based analysis, the former is classified as initial-mora accent, and the latter as penultimate-mora accent.
3.2 Bimoraic noun accent

Bimoraic words are either monosyllabic or disyllabic. The internal structure of monosyllabic words is basically either (C)V:, (C)V\textsubscript{N}, or n(C)V. Examples are \textit{nda}: 'you', \textit{tp\textsubscript{a}x} 'tooth', and \textit{tm\textsubscript{a}ma} 'horse'. Disyllabic bimoraic words are simply (C)V(C)V. Examples are \textit{f\textsubscript{i}ja} 'father', \textit{m\textsubscript{u}l\textsubscript{\textit{\textdagger}}} 'insect', etc. Some monosyllabic words with a long vowel (i.e., (C)V:) lose the vowel length when followed by a particle, e.g., \textit{f\textsubscript{a}x}: 'tea': \textit{f\textsubscript{a}-nu}, and others simply have two variants—one with length and the other without it. For example, \textit{\textdagger i}: 'handle' can be uttered in either \textit{\textdagger i:-nu} HL-L or \textit{i\textdagger nu} H-L when followed by the particle \textsl{nu}.

As seen in the overview, there are three accent classes for bimoraic nouns in Shiraho according to RHKK's data: atonic, initial-mora accent\textsuperscript{9}, and penultimate-mora accent. Atonic words are uttered in flat pitch or in relatively high level pitch (RHKK 2007:60). Words with initial-mora accent are HL. Words in both classes retain their pitch shapes, i.e., HH and HL respectively, when followed by the particle \textsl{nu}, e.g., \textit{tiru-nu} HH-H 'color (Sub.).' \textit{jul\textdagger da-nu} HL-L 'branch (Sub.)'. Since the mora is the unit that carries an accent, both \textit{\textdagger oo} and \textit{\textdagger lo} are HL (e.g., \textit{\textdagger na}: 'name' and \textit{n\textsuperscript{l}\textsuperscript{n}\textsuperscript{i}} 'chest'). Initial-mora accent words as well as atonic words include monosyllabic (e.g., \textit{\textdagger na}: 'name', \textit{\textdagger n\textsuperscript{l}\textsuperscript{n}\textsuperscript{i}} 'chest', \textit{nda}: 'you', and \textit{tm\textsubscript{a}ma} 'horse') and disyllabic words (e.g., \textit{b\textsubscript{u}l\textsubscript{\textdagger}} 'loin' and \textit{tiru} 'color').

When bimoraic words are uttered in isolation, as just described, they are either HH or HL. Although many atonic words remain atonic when followed by the particle \textsl{nu} (subject marker), some turn into HH-L pitch. For example, \textit{tiru} 'color' is in level pitch both in isolation and also when followed by the particle \textsl{nu}. In contrast, some words in the same atonic class are uttered in HH-L when followed by the particle \textsl{nu}; e.g., both \textit{\textdagger p\textsubscript{e}}: HH 'south' and \textit{\textdagger p\textsubscript{i}p\textsubscript{i}} HH 'buttock, rear end' are HH-L with the particle.

The other accent class for bimoraic words is penultimate-mora accent,
where the pitch falls immediately after the penultimate mora both in isolation and when followed by the particle nu. For example, \( na: \) 'name' is uttered with an accent on its penultimate mora, and when followed by the particle, the accent shifts onto the penultimate mora of the phrase; e.g., \( na:-nu \) HH-L 'name'. It should be pointed out that the domain of an accent for this group of words includes the particle nu.

As described above, a word-final long vowel undergoes shortening, and this occurs only when followed by nu. This phenomenon also appears in penultimate-mora accent words. It is seen only in words with HL pitch in (5), and words with HH do not show the phenomenon.

(5) isolation

\[
\begin{array}{lcc}
\text{CV:-nu} & \text{CV-nu} \\
\text{pa: 'leaf'} & \text{\( \sim \)} & \text{\( \sim \)} \\
\text{\( \sim \)} & \text{\( \sim \)} & \text{\( \sim \)} \\
\text{ju: 'fish'} & \text{\( \sim \)} & \text{\( \sim \)} \\
\text{\( \sim \)} & \text{\( \sim \)} & \text{\( \sim \)} \\
\text{pi: 'fart'} & \text{\( \sim \)} & \text{\( \sim \)} \\
\end{array}
\]

In addition to the vowel length alternation discussed so far, there is an alternation in pronunciation. According to the data provided in (RHKK 2007), the word \( \min \) 'eye' is in HL pitch. However, it can be pronounced as either \( \min-nu \) HL-L or \( \minl-nu \) HH-L when used with the particle \( \nu \). The former is the pitch of the initial-mora accent, and the latter the penultimate-mora accent. This can be seen as a change in progress, although it is not known towards which direction change is heading from the data. For the time being, \( \min \) 'eye' is listed as penultimate-mora accent.

(6) Accentual patterns of bimoraic nouns

<table>
<thead>
<tr>
<th>Phonemic</th>
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<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atonic</td>
<td>HH ~ HH-H</td>
<td>( \iota ki: 'tree' ) (~ ki-nu), ( \iota si: 'breast, milk' ), ( \iota p\varphi a: 'skin' ), ( \iota \pi \varphi a: 'flower' ), ( \iota \varphi i: 'year, age' ), ( \iota \kappa \varphi a: 'shoulder' ), ( \iota p\varphi i: 'needle' ), ( \iota \kappa \varphi a: 'a kind of hat' ), ( \iota \nu \pnu: 'boat' ), ( \iota \nu \pki: 'stalk' ), ( \iota \sako: 'hat' )</td>
</tr>
</tbody>
</table>
Some bimoraic words show two variants when followed by the particle *nu*. One variant demonstrates, just like other penultimate accent words, a pitch fall at the end of the word. The other pattern is that the pitch pattern of the individual accent remains even when followed by the particle. An example is ˊmin ˈeye', ˊmin-nu *HL-L ~ min₁-nu ˈeye (Sub.)'.

### 3.3 Trimoraic noun accent

Just like the accent of bimoraic words, there are three distinctive classes for trimoraic words: atonic in high-flat pitch, initial-mora accent, and penultimate-mora accent. Atonic words are uttered in high-level pitch throughout the words. The word-internal structures vary from monosyllabic to trisyllabic, e.g., *tsu: 'white (n.)', *tku: ga ˈegg', and *tʃukuru ˈbag'.
The canonical pitch shape of initial-mora accent is HLL. It remains the same when followed by the particle, e.g., galdzannu HLL ‘mosquito’; galdzannu HLL-L ‘mosquito (Sub.)’. Initial-mora-accent words are either disyllabic or trisyllabic. Disyllabic words usually contain a long vowel or a moraic nasal, e.g., \( \text{\`maja} \) ‘cat’ and ilnon ‘sand’. The word bulama ‘aunt’ is trisyllabic with three syllables. Trimoraic words with a long vowel such as \( \text{\`maja} \) ‘cat’ lose its length when uttered with a particle, e.g., \( \text{\`maja-} \) nu HL-L ‘cat (Sub.)’; yet the accent remains on the initial mora. Other attested words are \( \text{\`mugu} \) HLL ‘son-in-law’; \( \text{\`mugu-} \) nu HL-L ‘son-in-law (Sub.)’ and \( \text{\`nu:} \) HLL ‘throat’; \( \text{\`nu:}-\) nu HLL-L ‘throat (Sub.)’.

(7) Accentual patterns of trimoraic nouns

<table>
<thead>
<tr>
<th>Phonemic</th>
<th>Phonetic</th>
<th>Example</th>
</tr>
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<tbody>
<tr>
<td>Atonic</td>
<td>Flat</td>
<td>( \text{`pa:} )kur ‘bag’, ( \text{`tspa} ) ‘beside’; ( \text{`pa:} )pir ‘butterfly’, ( \text{`tjadzi} ) ‘dragonfly’, ( \text{`pa:} )piri ‘drug’, ( \text{`tsga} ) ‘egg’; ( \text{`ttif} ) ‘five’, ( \text{`tjyidz} ) ‘goat’, ( \text{`xmadzi} ) ‘hair of head’, ( \text{`titari} ) ‘left’, ( \text{`tatts} ) ‘tomorrow’, ( \text{`tykmon} ) ‘cloud’, ( \text{`tina} ) ‘sea’, etc.</td>
</tr>
<tr>
<td>Initial mora</td>
<td>HLL</td>
<td>bulama ‘aunt’, galra( \text{`si} ) ~ galra( \text{`si} ) ‘crow’, bu( \text{`tifu} ) ‘day before yesterday’, mil( \text{`dumu} ) ‘female’, bilm( \text{`dumu} ) ‘male’, mal( \text{`gar1} ) ‘medicine’, bu( \text{`lnari} ) ‘sister’, bul( \text{`dzasa} ) ‘uncle’, pe( \text{`r} ) ‘mole’, ju( \text{`lima} ) ‘five’, ( \text{`p:} )( \text{`rit} ) ‘goat’, ( \text{`tadzi} ) ‘hair of head’, ( \text{`tatts} ) ‘tomorrow’, ( \text{`tykmon} ) ‘cloud’, ( \text{`tina} ) ‘sea’, etc.</td>
</tr>
<tr>
<td>Penultimate mora</td>
<td>OHL</td>
<td>j( \text{`jt1} )ra (~j( \text{`jt1} )) ‘below’, pi( \text{`rolma} ) ‘daytime’, k( \text{`ko} )( \text{`tji} ) ~ k( \text{`ko} )( \text{`tisi} ) ‘jaw’, bu( \text{`iya} ) ‘nephew; niece’, s( \text{`pmi} ) ‘fish scale’, kp( \text{`ji} ) ‘smoke’, aku( \text{`b1} ) ‘yawn’, men( \text{`t1} ) ‘front’, bu( \text{`ltu} ) ‘husband’, n( \text{`tji} ) ‘six’, ut( \text{`ltu} ) ‘sound’, etc.</td>
</tr>
<tr>
<td>Mora accent</td>
<td>HLL-HH-L</td>
<td>k( \text{`ji} ) ‘wind’, ( \text{`jp} )( \text{`ji} ) ~ ( \text{`jp} )( \text{`tji} ) ‘mouth’, t( \text{`lu} ) ‘bird’; ( \text{`p:} )( \text{`k1u} ) ‘box’, ( \text{`p`na} ) ‘nose’, t( \text{`ki} ) ‘bamboo’, k( \text{`pi} ) ‘paper’, p( \text{`tji} ) ‘elbow’, p( \text{`tji} ) ‘bridge; ladder’, s( \text{`ne} ) ‘loincloth’, p( \text{`tu} ) ‘person’, k( \text{`ri} ) ‘it’, p( \text{`ne} ) ‘mustache; beard’, etc.</td>
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</table>

There is another tonic accent class for trimoraic words in Shiraho. It is second-mora accent. As named, an accent is on the second mora from the
beginning of words, which include 0010, oo10, and O \ oo. Examples are pirolma 'daytime', ay\l ga 'yam', and p\q \ ku: 'box'. They keep an accent on the mora when followed by the particle mu. Among them, a long vowel in the final syllable becomes short when uttered with the particle with an accent on the second mora, e.g., p\q \ ku: HHL 'box'; \p\q\ku\1\-\mu\ HHL- 'box (Sub.)'.

4. Reconstruction of Proto-Shiraho Accent

This section consists of two main subsections: 4.1 and 4.2. The former shows accent correspondence sets, and also attempts to reconstruct the Proto-Shiraho accent system. The other section discusses the development of modern Shiraho accent from our reconstructed Proto-Shiraho system.

4.1 Accent Correspondence and Reconstruction

The RHKK analysis gives three accent classes: atonic, initial-mora, and penultimate. On the other hand, Sakishima analyzes his own data on Shiraho accent as a system with atonic and tonic distinctions.

A comparison of these accent systems reveals that there is a regular correspondence in accent. As demonstrated below, there are six patterns: (A) – (F) for bimoraic and (G) – (L) for trimoraic words. Pattern in (A) shows that RHKK atonic corresponds to atonic in Sakimura. One in (B) RHKK atonic corresponds to Sakimura's tonic. Patterns in (C) to (F) are as follows: RHKK initial-mora to Sakimura's atonic, RHKK initial-mora to Sakimura's tonic, RHKK penultimate to Sakimura's atonic, and RHKK penultimate to Sakimura’s tonic respectively. The correspondence patterns just shown are exactly the same with trimoraic words, as well.

(8) Correspondences between RHKK and Sakimura accent classes
(a) Bimoraic

RHKK : Sakimura

— 109 —
A. atonic : atonic
‘dog’  i'linu : inu LH ~ LL-LL
‘horse’  i'mma : mma LL-LL
‘shoulder’  i'kata : kata LH ~ LL-LL

B. atonic : tonic
‘breast; milk’  i'tji: : si: HL-LL
‘foot/leg’  i'pan : pan HL-LL
‘tree’  i'ki: (~ ki-nu) : ki: HL-LL

C. initial-mora : atonic
‘garment’  \\ kin : sin"o: LH~ LL-LL
‘uncle’  bul'dza : bu'za LL-LL

D. initial-mora : tonic
‘bride’  ju'limi : jumi HL-LL
‘chest’  n'ni : nnj: LL~ HL-LL
‘water’  mil'dzi ~ mil'dzi : mil'zi: HL~ HL-LL

E. penultimate : atonic
‘navel’  i'put'fo ~ i'put'so : pu'so: LH~ LL-LL

F. penultimate : tonic
‘leaf’ (~ pa'l-nu)  \ pa: : pa: HL-LL
‘name’  \ na: : na: HL-LL
‘shade’  \ ke: ~ k3: : ke: HL-LL

(b) Trimoraic

RHKK : Sakimura

— 110 —
<table>
<thead>
<tr>
<th>G.</th>
<th>atonic</th>
<th>atonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘drug’</td>
<td>ḫuṭfi</td>
<td>ḫutsi</td>
</tr>
<tr>
<td>‘left’</td>
<td>ḫiṭari</td>
<td>ḫiṭari</td>
</tr>
<tr>
<td>‘tomorrow’</td>
<td>ḫat̬sa</td>
<td>ḫat̬sa</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>H.</th>
<th>atonic</th>
<th>tonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘cloud’</td>
<td>ḫkùmon</td>
<td>ḫkùmon</td>
</tr>
<tr>
<td>‘finger’</td>
<td>ḫibī</td>
<td>ḫiñubi</td>
</tr>
<tr>
<td>‘sea’</td>
<td>ḫinagā</td>
<td>ḫinagā</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I.</th>
<th>initial-mora</th>
<th>atonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘aunt’</td>
<td>ḫu̞lamā</td>
<td>ḫu̞lamā</td>
</tr>
<tr>
<td>‘cane’</td>
<td>ḫu̞lsan</td>
<td>ḫu̞lsan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>J.</th>
<th>initial-mora</th>
<th>tonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘crow’</td>
<td>ḫga̞raji ~ ḫgari</td>
<td>ḫga̞raji</td>
</tr>
<tr>
<td>‘female’</td>
<td>ḫmīldumu</td>
<td>ḫmīldumu</td>
</tr>
<tr>
<td>‘male’</td>
<td>ḫbīldumu</td>
<td>ḫbīldumu</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>K.</th>
<th>penultimate</th>
<th>atonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘loincloth’</td>
<td>ḫsane</td>
<td>ḫsane</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>L.</th>
<th>penultimate</th>
<th>tonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘front’</td>
<td>ḫmenta</td>
<td>ḫmenta</td>
</tr>
<tr>
<td>‘smoke’</td>
<td>ḫkpusi</td>
<td>ḫkpusi</td>
</tr>
<tr>
<td>‘yawn’</td>
<td>ḫakubi</td>
<td>ḫakubi</td>
</tr>
</tbody>
</table>

From a theoretical point of view, since there are six correspondences as demonstrated above, six distinctive accent classes can be reconstructed for
both bimoraic and trimoraic nouns. Considering the characteristics of Japonic accent, there are at least ten theoretically possible accentual patterns for bimoraic and fourteen for trimoraic words as shown in (9) and (10).

As shown in (9), for bimoraic words, there are five atonic (9a) – (9e) and five tonic pitch patterns (9f) – (9j). Atonic classes are basically flat or rising in pitch.

Regarding patterns (9f) – (9j) in the tonic group, accent patterns in (9f), (9g), and (9h) are identical (i.e., initial-mora accent) in isolation. However, the ones in (9g) and (9h) are penultimate-accent when followed by a particle. They are different from (9f) in their domain, as well. The difference between (9g) and (9h) is whether or not the initial pitch is distinctive. This also accounts for the difference between (9i) and (9j)—both are second-mora (or final) accent.

For trimoraic words, there are at least seven possible accentual patterns for atonic (10a) – (10g) and seven (10h) – (10n) for tonic. Similar to bimoraic accent, in the trimoraic accent the initial pitch height can be distinctive. Whether or not the initial pitch is distinctive accounts for the difference between (10i) and (10j), (10k) and (10l), and (10m) and (10n) in trimoraic words.

(9) Bimoraic

<table>
<thead>
<tr>
<th>Atonic</th>
<th>Tonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. HH-H</td>
<td>f. HL-L</td>
</tr>
<tr>
<td>b. LL-L</td>
<td>g. HL ~ LH-L</td>
</tr>
<tr>
<td>c. LH-H</td>
<td>h. HL ~ HH-L</td>
</tr>
<tr>
<td>d. LH ~ LL-H</td>
<td>i. HH-L</td>
</tr>
<tr>
<td>e. LL-H</td>
<td>j. LH-L</td>
</tr>
</tbody>
</table>

(10) Trimoraic

<table>
<thead>
<tr>
<th>Atonic</th>
<th>Tonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. HHH-H</td>
<td>h. HL.L-L</td>
</tr>
</tbody>
</table>
Let us assume that proto Shiraho bimoraic accent system includes six out of the ten listed in (9) and also six accent classes of the fourteen in (10).

The next question is then what distinguishes one from another phonemically within the phonological system. By taking into account the fact that a locus of pitch fall is distinctive, I have attempted to reconstruct an earlier accent system of Shiraho nouns. The following (11) is our proto-Shiraho (PSh) accent system for bi- and trimoraic nouns. The reconstructed forms indicated by (A) – (L) in (11) correspond to the data sets (A) – (L) in (8).

(11) Proto-Shiraho accent

(a) Bimoraic nouns

<table>
<thead>
<tr>
<th>PSh</th>
<th>RHKK</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A. *HH-H</td>
<td>atonic</td>
<td>:</td>
</tr>
<tr>
<td>B. *HH-L</td>
<td>atonic</td>
<td>:</td>
</tr>
<tr>
<td>C. *LL-H</td>
<td>initial-mora</td>
<td>:</td>
</tr>
<tr>
<td>D. *HL-L</td>
<td>initial-mora</td>
<td>:</td>
</tr>
<tr>
<td>E. *LH ~ LL-H</td>
<td>penultimate</td>
<td>:</td>
</tr>
<tr>
<td>F. *HL ~ LH-L</td>
<td>penultimate</td>
<td>:</td>
</tr>
</tbody>
</table>

(b) Trimoraic nouns

<table>
<thead>
<tr>
<th>PSh</th>
<th>RHKK</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>G. *HHH-H</td>
<td>atonic</td>
<td>:</td>
</tr>
</tbody>
</table>

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As the proto-Shiraho accent system indicates, atonic words in RHKK and Sakimura's go back to an atonic form in Proto-Shiraho (11A). For example, *imu 'dog' in RHKK and inu LH 'id.' in Sakimura are postulated to have developed from PSh *inu HH 'id.' . Words that are atonic in RHKK, but tonic in Sakimura's (11B) can be analyzed as having evolved from a proto-form with final accent. For example, word for 'tree' is *ki: in RHKK and ki: HL in Sakimura. Their earlier form is claimed to be *ki: HH-L. Other bimoraic words in (C) – (F) as well as trimoraic words in (G) – (L) can be explained in a similar manner.

4.2 Development of Shiraho accent

The next question is 'what type or types of change(s) did they undergo in their (pre-)history from their proto-forms to the current forms?' In other words, can we account for the development of each accent class in RHKK and Sakimura in a systematic way?

As for RHKK's bimoraic nouns, there are three changes that occurred in the course of the development. They are as follows:
H-flat merger: Simply means a phenomenon where words with H-level when uttered without a particle merge.

Initial Rising: A phenomenon where words with LL or LLL in isolation become HL or HLL in pitch respectively. As a result, they merge into the pre-existing initial high accent class.

Final-H merger: Words with final-H pitch in either with a particle or without merge into one accent class.

As shown in (12), *HH-H and *HH-L merged into one, resulting in HH-H. Both are H-level pitch without a particle. This near identical pitch shape has triggered this merger.

*LL-H and *HL-L merged by Initial Rising, which turned *LL(L) into *HL(L). As a result, both merged.

*LH ~ LL-H and *HL ~ LH-L merged. Since they both share an LH pitch pattern—in the former when uttered in isolation and in the latter when followed by a particle, they merged as one.

(12) Development of Shiraho noun accent (RHKK data)

(a) Bimoraic accent

<table>
<thead>
<tr>
<th>PSh</th>
<th>H-flat merger</th>
<th>Initial Rising</th>
<th>Final-H merger</th>
</tr>
</thead>
<tbody>
<tr>
<td>*HH-H</td>
<td>&gt; HH-H</td>
<td>(e.g., *linu ‘dog’)</td>
<td></td>
</tr>
<tr>
<td>*LL-H</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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(b) Trimoraic accent

PSh  H-flat merger  Initial Rising  Final-H merger

*HHH-H

>  HHH-H

(e.g., *H H H - `left'

*HHH-L

>  HLL-L

(e.g., *H H H L - `aunt'

*LLL-H

>  HLL-L

*LLH ~ LLL-H

>  OHL

*LHL ~ LLH-L

(e.g., *L L H I - `smoke'

With regard to trimoraic accent classes, the changes that occurred in the development of the bimoraic accent system also had an affect on the trimoraic accent system. This is because the changes occurred whenever the conditions were met. *HHH-H and *HHH-L classes underwent H-flat merger. *LLL-H became HLL-L by Initial Rising. *LLH ~ LLL-H and *LHL ~ LLH-L classes merged as one.

The development from the proto-form to Sakimura’s Shiraho accent is much simpler than that of RHKK’s. Simply put. Proto-Shiraho atonic classes
all merged into one. On the other hand, all tonic classes merged into one. As a result, two distinctive accent classes came to exist. All atonic classes merged into one, and all tonic classes became one. More specifically, in Proto-Sakimura, there are three atonic accent classes for bimoraic nouns: *HH-H, *LL-H, and *LH ~ LL-H. As for bimoraic tonic classes, there are three as well: *HH-L, *HL-L, and *HL ~ LH-L. Similarly for trimoraic nouns, there are three atonic classes (*HHH-H, *LLL-H, and *LLH ~ LLL-H) and three tonic classes (*HHH-L, *HLL-L, and *LHL ~ LLH-L). The former classes merged into one class as atonic, and the latter as tonic.

(13) Development of Shiraho noun accent (Sakimura's data)

(a) Bimoraic accent

PSh  atonic merger

*HH-H

*LL-H > atonic (i.e., LH, LL)

*LH ~ LL-H (e.g., inu LH 'dog')

PSh  tonic merger

*HH-L

*HL-L > tonic (i.e., HL)

*HL ~ LH-L (e.g., ki: HL 'tree')

(b) Trimoraic accent

PSh  atonic merger

*HHH-H

*LLL-H > atonic (i.e., LLH, LLL)

*LLH ~ LLL-H (e.g., piṭaṭi LLL 'left', hutsiri LLH 'drug')
PSh tonic merger
*HHH-L
*HLL-L > tonic (i.e., LHL, HLF ~ HLL-L)
*LHL ~ LLH-L (e.g., akubi HLL 'yawn', kumun LHL 'cloud')

5. Conclusion
This paper has looked into Sakimura's and RHKK's Shiraho accent data and outlined the accent systems. And then, on the basis of the correspondences in the data, a Proto-Shiraho accent system for nouns was reconstructed. The reconstructed system shows that there were six distinctions for both bimoraic and trimoraic nouns in the earlier form of Shiraho dialect.

Regarding the development of the modern systems, contrary to the number of distinctions in accent, the development of modern Shiraho accent forms is rather simple as we have discussed.

If the reconstructed form is the one from which modern Shiraho accent has evolved, then it would be natural for us to question how Proto-Shiraho accent is different from or similar to an earlier form of Hateruma dialect. Furthermore, what was proto Shiraho-Hateruma accent like? What was the course of development both languages underwent? Answering these questions would contribute to a better understanding of how language changes.

Notes
* This research was supported by a Grant-in-Aid for Scientific Research from the Japan Society for the Promotion of Science, under project 23652086. I would like to thank the Japan Society for the Promotion of Science for giving me an opportunity to conduct the research. I am also grateful to Chris Davis and Kyle Ikeda for their helpful comments to improve my paper. Any remaining shortcomings are mine.
1 Shiraho accent is also discussed in Sakimura (2006). This article is a re-edited version of Sakimura (1987). As far as the data and analysis are concerned, there is no critical difference between them. Thus, the data in Sakimura (2006) will only be mentioned when necessary.

2 It should be mentioned that Ishigaki (1971:88-96) also discusses the accent system of Shiraho nouns. According to his analysis, there are two distinctive classes: one in flat pitch and the other HL (HH-L when followed by a particle). Since Ishigaki’s data are not large enough to establish regular correspondences, they are not used for our reconstruction. However, needless to say, Ishigaki’s data will be discussed when necessary.

3 Proto Hateruma noun accent has already been reconstructed. See Shimabukuro (2015).

4 Sakimura (2006:205) uses the terms ‘a-rui’ and ‘b-rui’ to distinguish one class from the other.

5 The phonetic pitch shape is in square brackets (i.e., “[ ]”). Phonetic pitch variations are shown with a slash ‘/’ in between.

6 The pitches preceded by the symbol ‘~’ show the pitch patterns of words with a particle.


9 There is a note saying ‘new’ next to the word (Sakimura 1987:10 and 2006:211).

10 The consonant s is not alveolar. See Sakimura (1987:10 and 2006:211) for detail.

11 In Sakimura’s data in both 1987 and 2006, some words are listed in parentheses: for example, (俵 [təˈɾa]) for ‘straw bag’ (Sakimura 1987:10 and 2006:211). In this paper we list them as given in the original data, although the reason for the parentheses is not clear.


16 The consonant *s* is not alveolar. See Sakimura (1987:9 and 2006:210) for detail.

17 The consonant *s* is not alveolar. See Sakimura (1987:9 and 2006:210) for detail.


22 The consonant *s* is not alveolar. See Sakimura (1987:9 and 2006:209) for detail.


26 The consonant *z* is not alveolar. See Sakimura (1987:9 and 2006:209) for detail.

27 Cf. ‘*sə*’ ‘gray hair’ in Sakimura (2006:209). The consonant *s* is not alveolar. See also Sakimura (1987:9) for detail.


29 The consonant *s* is not alveolar. See Sakimura (1987:9 and 2006:210) for detail.


35 Cf. pay 'foot/leg' in flat pitch in Ishigaki (1971:95).
37 Cf. $nə\tilde{\iota}$ 'right' in Sakimura (2006:210).
38 Cf. $nay$ 'salt' in flat pitch in Ishigaki (1971:95).
39 There is another atonic noun, $gu\tilde{s}an$ LMM ~ ? 'cane' (Sakimura 2006:211),
    which is not included in (2), since it is not known whether or not the word is
    in low flat pitch when followed by a particle.
    See also Sakimura (1987:10) for detail.
41 This is provided in parentheses under LMM pitch in Sakimura (1987:11 and
    2006:211).
    See also Sakimura (1987:10) for detail.
43 Cf. $pit\tilde{g}i$ 'cultivated field' in Sakimura (2006:211).
45 Cf. $ka\tilde{n}a\tilde{p}$ 'hoe' in Sakimura (2006:211).
47 Cf. $gub\tilde{m}a$ 'little finger' in Sakimura (2006:211).
48 The consonant $s$ is not alveolar. See Sakimura (1987:10 and 2006:211) for
detail.
49 Cf. $b\tilde{z}:ma$ 'we' in Sakimura (2006:211). There is a note saying 'old' next to
    the word (Sakimura 1987:10 and 2006:211).
50 Cf. $f\tilde{u}mo$ 'cloud' in flat pitch in Ishigaki (1971:95).
The consonant *ts* is not alveolar. See Sakimura (1987:10 and 2006:211) for detail.

The consonant *ts* is not alveolar. See Sakimura (1987:10 and 2006:211) for detail.


Our symbols are slightly different from those used in RHKK (2007), due to the availability of the symbols in font.

‘’ indicates a syllable boundary.

There is one exception in the data. On page 33 the last syllable of the word *kansu μu* ‘up and down’ is marked with ‘\’ even though the syllable is short. This could be a typo(?).

The pitch of the initial mora is not indicated in the original data.

‘oo’ indicates a syllable consisting of a long vowel or a short vowel followed by a moraic nasal.

‘accent’ indicates the locus of pitch change, i.e., a fall in pitch. ‘Initial-mora accent’ means the pitch falls immediately after the first mora.

The phonetic behavior of the underlined words is attested in the source when followed by the particle *mu*.

In this category, all words are attested in the original source. However, words are listed without underlining.

In the data there is a word marked with ‘\’ , i.e., *pi /tfai* ‘forehead’. This is the only one with a rising pitch.

Cf. *jalqata* ‘id.’ and *jadza* ‘id.’ are also listed.

Cf. *tku:ga* ‘id.’ is also listed.

Cf. *aldza* ‘id.’ is also listed.

Cf. *palma* ‘id.’ is also listed.

Cf. *goklka* ‘id.’ is also listed.
References


Sakimura, Hirohumi. 2006. “Hateruma hōgen no onchō taikei—hageshii koki ni yotte onchō henka to tayō na chōchi no shōjiteiru hōgen (hosoku) [Tonal system of Hateruma dialect—a dialect with various pitch patterns resulting from the tonal changes triggered by strong air flow in speech (Supplement)]”, Ryūkyū Hōgen to Kyūshū Hōgen no Inritsu teki Kenkyū [Prosodic studies of Ryukyuan and Kyushu dialects], 203-212. Tokyo: Meiji Shoin.


論文要旨

白保方言名詞アクセント体系再建の試み

島袋 盛世

石垣島白保方言のアクセントについての論文、崎村 (1987) と琉球方言研究クラブ (2007) で分析されているデータにもとづき考察を行う。これら2つのデータが示すアクセント体系は同一ではなく、異なる。

本稿の主な目的の1つはこれらの異なるアクセントデータを体系的にとらえ、2モーラおよび3モーラ名詞を中心に分析し記述することである。

もう1つの目的は、これらの名詞アクセント体系にもとづき、白保祖先語アクセントを再建すること、そして再建された祖先語から上述のそれぞれの現代白保アクセント体系へ発達した過程を説明することである。白保祖先語アクセントを再建することにより、今後の課題である白保・波照間祖先語アクセントの再建及びそれぞれのアクセント体系の変遷を明らかにすることが可能になる。

本稿ではアクセントの規則的な対応関係に基づき、比較方法で白保祖先語の2モーラおよび3モーラ名詞のアクセント体系を再建した結果、それぞれのモーラ数名詞において弁別機能のあるアクセントの型は6つであることが分かっ

た。更に、再建した祖先語のアクセント体系から現代白保アクセントへの変遷の過程において起こった変化は、1～3つ程度であることも明らかになった。

アクセント体系の変遷に関わった変化は比較的少ないが、これらの変化により、アクセントが統合し、6つの型を持つ複雑な祖先語アクセント体系から2つ又は3つの型を持つ現代のアクセント体系へと変化してきたことになる。