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# Pitch accent typology and intonation in the three dialects of Ryukyuan

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## Abstract

This paper examines the intonation of the three dialects of Ryukyuan from a perspective of lexical pitch accent typology. Together with Japanese, Ryukyuan forms a Japonic language family; it is also an endangered and understudied language despite its typologically interesting features. The three dialects of Ryukyuan differ in their lexical pitch accent types; they have an H*L accent (Shuri), an L*H accent (Nakijin), and no accent (Miyako) respectively. Furthermore, Ryukyuan has obligatory mood suffixes to indicate various sentence types including the presence or absence of the focus. In this paper, we analyze the intonation in the three dialects of Ryukyuan with reference to the syntactic structure and focus manifestation. The results showed both similarities and differences in their prosodic organizations. The importance of a phrasal tone (H- and L-) as well as the similarity between the L*H dialect and the accentless dialect are discussed.

**Index Terms**: Ryukyuan, lexical pitch accent typology, syntax, focus, mood suffix

## 1. Introduction

Ryukyuan is a sister language to Japanese, which is spoken in the Ryukyu Islands situated at the southernmost part of the Japanese archipelago. Together, these two languages form the Japonic language family. Today, most of the Ryukyuan dialects are endangered (UNESCO 2009) and the younger generation of speakers is monolingual in Japanese. The accent patterns of the Ryukyuan dialects are relatively well covered at the word level [1]. On the contrary, research on intonation has just begun, and it is in a very rudimentary stage [2]. In this paper, the intonational manifestation of the three dialects of Ryukyuan that differ in the pitch accent typology is examined with respect to syntax and focus. All the intonation data presented in this paper were obtained in my fieldworks conducted between 2008 – 2015.

The three dialects dealt with in this study are the Shuri dialect, the Nakijin dialect, and the Miyko (Irabu) dialect. Shuri used to be the capital of the Ryukyu Kingdom and is the most influential dialect among the Ryukyuan dialects. As for the pitch accent typology, Shuri has an H*L (falling) accent, Nakijin has an L*H (rising) accent, and Miyako has no accent, i.e. it is an accentless dialect. A large majority of Japanese and Ryukyuan dialects have the H*L accent, which is represented by Tokyo Japanese and Shuri Ryukyuan [1]. In contrast, dialects with an L*H accent and accentless dialects are minorities and understudied. In the present study, intonation of the three dialects are examined by using the same framework.

Another interesting point from a typological perspective is the fact that Ryukyuan has an obligatory mood suffix to indicate the sentence type. It indicates whether the sentence is declarative, interrogative (yes-no question), wh-question, or with a focus word or not. Such a language appears to be rare among the worlds' languages and it will be of a typological interest to examine if prosody is used as well in manifesting an information structure (focus). Details of the mood suffixes and the use of intonation in the Shuri dialect are reported previously [2]. The present study adapts the AM theory [3] as conceptual background.

## 2. Lexical pitch accent typology and data collection

Ryukyuan is a lexical pitch accent language like Japanese, Korean, Swedish, and Norwegian. All the content words In Ryukuan have a lexically specified accent manifested by pitch. This is in contrast with a language like English in which a 'pitch accent' appears as post lexical for the manifestation of intonation. The geographical locations of the three dialects of Ryukyuan are shown in Fig. 1 below.

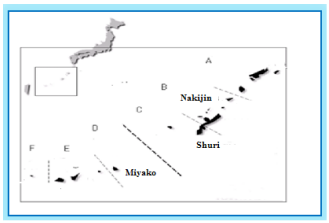


Figure 1: *Map of the Ryukyu Islands.*

### 2.1. Shuri

Thus far, three different types of lexical pitch accents have been reported for Ryukyuan. The most common type, such as attested in the Shuri dialect spoken in southern Okinawa, has two types of accents similar to Tokyo Japanese. One is a falling accent and the other is a flat accent (alternatively the former can be referred to as accented while the latter unaccented following the AM theory). The position of the pitch drop for the falling accent is distinctive in Tokyo Japanese and for n-mora word there will be n+1 accent types. In contrast, the position of the pitch drop for the falling accent is fixed to the second mora from the onset of the word in Shuri Ryukyuan.

### 2.2. Nakijin

The Nakijin dialect that is spoken in northern Okinawa Islands, is claimed to have three types of pitch accents by previous studies, for review see [4] [5]. However, the HL accent in this dialect is extremely limited in distribution, and its phonetic manifestation has been claimed to be significantly different from the true H*L accent such as found in Tokyo Japanese or Shuri Ryukyuan [6]. Therefore, it is only shown the other two types here. In the Figure 2 (a, b) below, the accent types found


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in the Shuri and Nakijin are demonstrated in word isolation form. The pitch range used for the pitch accents in the Nakijin dialect is narrow, which was shared by other speakers of this dialect as well.

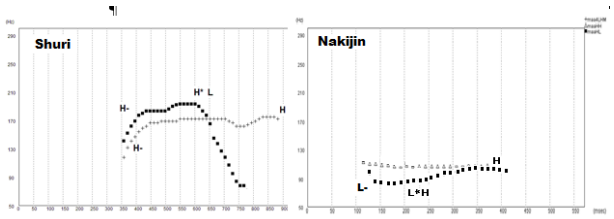



Figure 2: *F0 contours for the two types of pitch accents in Shuri and Nakijin. (Male speakers)*

### 2.3. Miyako

The third dialect Miyako (Irabu), which is spoken further south along the Ryukyu Islands, does not have any pitch accents. It is therefore referred to as an 'accentless' dialect [7]. Since a regular F0 rise is observed at phrase onset, we consider this pitch shape as the basic intonation unit for the Miyako dialect. Such a F0 configuration is similar to the flat accent (H) in the Shuri dialect.

### 2.4. Data collection

A set of sentences to examine intonation in Ryukyuan dialects with reference to modality, syntax, and focus was prepared [2].The sentences were further modified for the vocabularies and particles in order to be applicable to each dialect. The main speakers for the current investigation were; a male speaker in his 60's (Shuri), a female speaker in her 70's, and a male speaker in his 80's (Miyako) at the time of recording. Since Ryukyuan is an endangered language as well as an understudied language regarding its intonation, it is not easy to conduct a quantitative analysis with many speakers. The possibility of individual features in utterances cannot be ruled out, but starting analysis by selecting a typical single speaker is a method often used for describing intonation in the first place [3] [8].

## 3. Syntactic structure

In many languages, a syntactic difference such as left-branching vs. right-branching is manifested by intonation. In Tokyo Japanese, a right-branching syntactic boundary introduces F0 boosting while a left-branching boundary does not [9]. A similar manifestation is found in some other dialects of Japanese as well, see review [10]. A syntactic difference between left-branching vs. right-branching was tested by using the same material previously used for Japanese [11] with some adjustments for Ryukyuan.

### 3.1. Left-branching vs. right-branching

Few sentences are designed to test the left- vs. right-branching parameter. The example sentences are from the Shuri dialects.

(1)

i. left-branching

| | | | |
|---|---|---|---|
| [[[Akasaru | iibi-nu] | uubi] | a-N]. |
| red | shrimp-GEN | obi | exist-I |

'There is a red shrimp (pattern) obi.

ii. right-branchig

| | | | |
|---|---|---|---|
| .[[Akasaru ] | [miisaru | uubi] | a-N]] |
| red | big | obi | exist-I |

'There is a red big obi.'

(2)

i. left-branching

| | | |
|---|---|---|
| [[Jiroo-ga | yum-i-nee] | [niNzibusj-a-N]] |
| HUM-NOM | read-PRES-CNJ | sleepy-exist-I |

'When Jiroo reads, I become sleepy.'

ii.right-branching

| | | |
|---|---|---|
| [[Jirooya | [ num-i-nee | [niNzibusj-a-N]]] |
| HUM-TOP | drink-PRES-CNJ | sleepy-exist-I |

'Jiroo becomes sleepy when he drinks.'

### 3.2 Shuri

Typical F0 contours for right- vs. left-branching sentences in Shuri dialect are compared in Figure 3 below. It can be seen that a right-branching syntactic boundary introduces F0 boosting (F0 reset) while a left branching boundary does not. The same type of F0 manifestation has been reported for Tokyo Japanese [5].

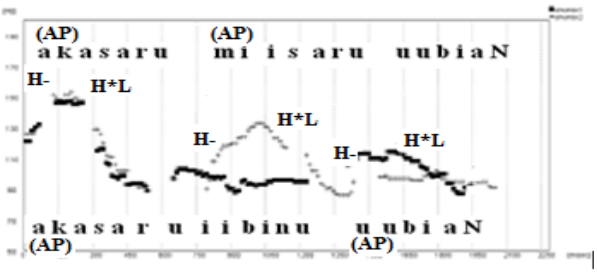
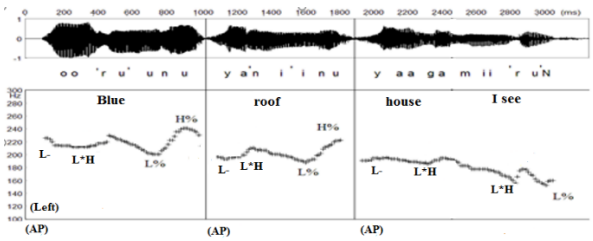



Figure 3: *Akasaru iibinu uubi aN. 'There is a red shrimp (pattern) obi.vs.Akasaru miisaru uubi aN. 'There is a new red obi.' in the Shuri dialect. (Male speaker) Adopted from [2].*

### 3.3. Nakijin

The F0 contours and sound waves for the two utterances are shown in Fig. 4 below for the Nakijin dialect. The left-branching utterance contains three accentual phrases (AP), each starts with a phrasal initial tone (L-) followed by an L*H accent. Unlike Tokyo Japanese, a right-branching does not introduce F0 boosting here, instead a pause is inserted at the syntactic boundary.



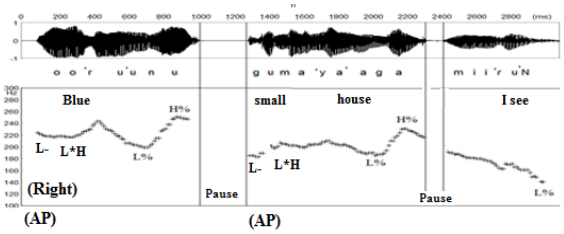



Figure 4: *Left-branching (above) vs. right-branching (below) in the Naikijin dialect. (Female speaker)*

### 3.4. Miyako

The F0 contours and sound waves for the two utterances in the Miyako dialect are shown in Fig. 5 below. The left-branching utterance consists of only a single accentual phrase. The right-branching utterance, on the other hand, consists of two accentual phrases, each starts with a phrase initial tone (H-). In other words, the right-branching utterance in the Miyako dialect has the same type of the manifestation as Tokyo Japanese and Shuri Ryukyuan.

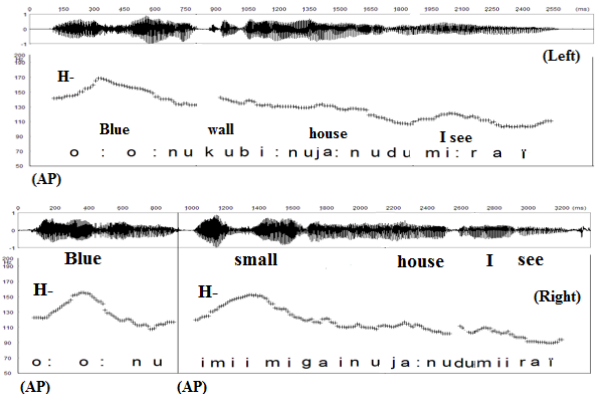



Figure 5: *Left-branching (above) vs. right-branching (below) in the Miyako dialect. (Male speaker)*

F0 manifestation of sentence (2) showed similar results to those for sentence (1) described above. Here, only the results from the Miyako dialect are shown in Figure 6.

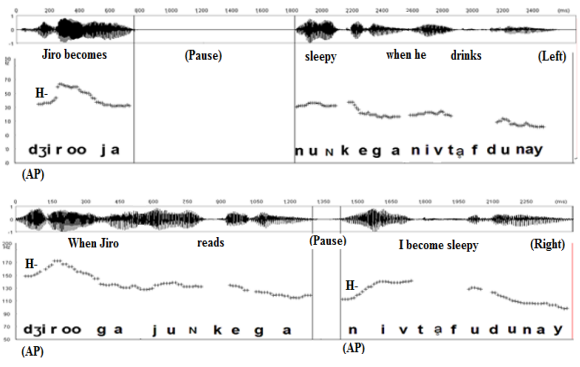



Figure 6: *Left-branching (above )vs. right-branching (below) in the Miyako dialect.(Male speaker)*

## 4. Focus

Manifestation of focus or information structure is one of the most popular topic in today's intonation study. In Ryukyuan, focus utterances are grammatically marked by the kakari particle and by the sentence final mood suffix. In this section, focus declarative sentences will be examined for the three dialects of Ryukyuan. The model sentence is shown in (3) below. The speaker was asked to reply to the question 'who is, by what, and where to'.

(3)

| | | | |
|---|---|---|---|
| Manami-ya | basu-shi-ru | Naafa Nkai | ich-u-ru |
| HUM-TOP | bus-FOC | Naha-LOC | go-PRES-U |

'Manami goes to Naha by bus'

### 4.1. Shuri

In Figure 7 below, it is 'by bus' that receives the focus to which a focus-particle 'ru' is added. The sentence final obligatory mood-suffix becomes also 'ru' to indicate that it is a declarative sentence that contains focus, i.e. focus is indicated by both the particle and by the mood suffix. It can be seen the focused phrase 'by bus', which has an H*L accent, is produced with an expanded F0 while the utterances before and after the focused phrase are produced with a compressed F0.

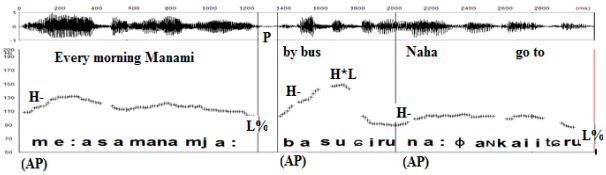
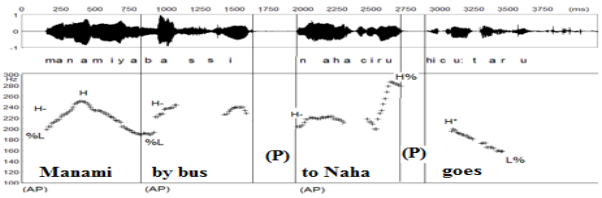



Figure 7: *Focus (on 'by bus') manifestation in the Shuri dialect. (Male speaker)*

### 4.2. Nakijin

In Figure 8 below, it is 'to Naha' that receives the focus to which a focus-particle 'ru' is added. The sentence final obligatory mood-suffix becomes also 'ru'. It can be seen it is not the phrase 'to Naha' that has F0 expansion, but the phrase




final particle 'ru' which is produced as extra high boundary tone (H%).

Figure 8: *Focus (on 'to Naha') manifestation in the Nakijin dialect (Female speaker)*

### 4.3. Miyako

In Figure 9 below, it is 'to Naha' that receives the focus to which a focus-particle 'ru' is added. The sentence final obligatory mood-suffix is omitted here, which is commonly found in the Miyako dialect. The F0 pattern is similar to that in

the Nakijin dialect, it is the phrase final particle ‘du’ that is produced with an extra high boundary tone (H%).

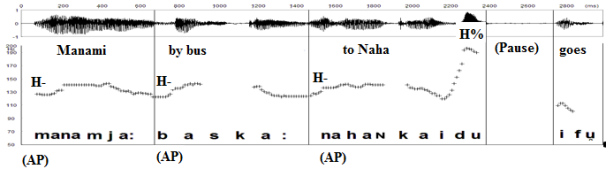



Figure 9: *Focus (on ‘to Naha’) manifestation in the Miyako dialect.(Male speaker*)

## 5. Discussion

In the present paper, three dialects of Ryukyuan that differ in the lexical pitch accent typology were examined for their prosodic manifestation with reference to the syntactic structure and focus. It was shown that in all the three dialects including the accentless dialect, such information as left- vs. right-branching structure and focus placement were regularly manifested in intonation. However, some differences that are likely to be related to the pitch accent typology were also present.

The first difference is the frequent use of pauses in the Nakijin and Miyako dialects. In the Nakijin dialect, the difference in syntactic structure was regularly manifested by a pause rather than by intonation. The Shuri dialect and Miyako dialect, on the other hand, manifest the right-branching by an F0 boosting (reset) in a similar way as Tokyo Japanese does.

Another difference is found in the manifestation of a focused phrase. In the Shuri dialect, an entire focused phrase is produced with an expanded F0 while in the Nakijin and Miyako dialects, only the focus particle after the focused phrase has an extra high tone (H%) to indicate focus. This is understandable considering the narrow pitch range produced by the L*H accent in the Nakijin dialect. It has been known for some time that there is an asymmetry in the production of the F0 fall and F0 rise in the pitch range. Due to the characteristics of the laryngeal muscles, F0 rise movement cannot produce the same pitch range as F0 fall can when everything being equal [12].

Regarding the Miyako dialect, it will be difficult for an accentless dialect to expand part of a phrase. Thus for both dialects, an insertion of the extra high phrase boundary tone after the focused phrase seems the most optimal way of manifesting focus.

As for the prosodic phrasing, all the three dialects group the accentual phrases (AP) into a larger unit like intonation phrase (IP) by using pitch reset and ‘downstep’ depending on the syntactic structure and focus. It is not only a sequence of H*L accents such as attested in the Shuri dialect that manifests downstep. Even a sequence of L*H accents in Nakijin as well as a sequence of accentless phrases in Miyako have shown ‘downstepping’ in their prosodic phrasing.

Previous studies of the accentless dialects in Japanese report that the F0 configuration of the basic intonation unit differs among the accentless dialects. In the Fukui dialect of Japanese, it is a low flat F0 configuration, but in the Kumamoto dialect of Japanese, it is a sharp F0 rise from the onset of the utterance to the prosodic boundary [11]. It is also reported in the same reference, that a local prominent intonation, e.g. H%, is used to indicate a syntactic boundary. The present study of the Miyako accentless dialect differs from such results reported previously since the regular use of H% was found only for the focus while the syntactic boundary was marked by the onset of an accentual phrase (H-).

Furthermore, the case of the Miyako dialect, which shows the characteristics of the accentual phrase while the accent itself does not exist, is meaningful in constructing an intonation model, i.e. how to postulate a phrase component and an accent component. The basic F0 unit found for the Miyako dialect is closely reminiscent to the phrase component in Fujisaki’s layered model of intonation in which an accent component is overlaid on a phrasal component [13]. Further studies are desirable for the prosody of understudied languages.

Another interesting point is the existence of the initial F0 rise (H-) in the accentless dialect of Miyako, which is closely reminiscent to that in the Shuri dialect (and even to that in the Tokyo Japanese). Accentless dialects are common among the lexical pitch accent languages such as Japanese, Ryukyuan, Korean, and Swedish. What they have in common is the great dialectal variation including the area where the pitch accents are ‘lost’. The similarity in the manifestation of a phrase initial F0 rise (H-) found in the Shuri dialect and in the Miayako dialect may indicate that the two dialects are related. Furthermore, even the Nakijin dialect with a phrase initial F0 fall (L-) followed by an L*H pitch accent, may be related to the Shuri dialect for which a phrase initial (H-) is followed by an H*L accent. A close examination of the dialectal variation found in the pitch accent realization may contribute to the study of language contact and historical development. Initial F0 rise (H-) is by no means a language universal. Both the phrase initial (H-) tone and a phrasing by downstep found in Japanese are not acquired at the beginner level of learners [14]. Further studies are in preparation to reveal some more typologically interesting features in Ryukyuan prosody.

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