

Shiraho
Devoicing and
Pitch Accent

Tyler Lau

Brief Overview
of Ryukyuan
Languages

Shiraho
Background

Pitch Accent
and Devoicing

Phonological
Constraints

Diachronic
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Shiraho Devoicing and Pitch Accent

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Overview

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Breakdown of Ryukyuan Languages

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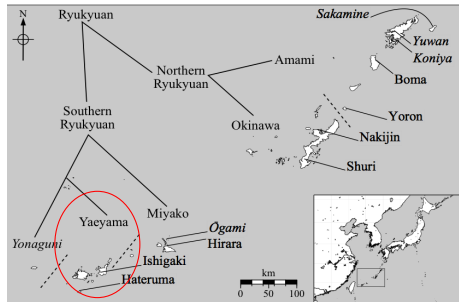
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- Minimally **5 languages** under the “dialect chain” definition (Serafim, 2008)
- But boundary between language and dialect unclear



Pellard (2013)

Language Diversity

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- | | | |
|-----------------------------|----------------------|------------|
| ● Japanese: | doko=e | ik-u=no |
| ● Shuri Okinawan: | maa=nkai | ic-u=ga |
| ● Miyara Yaeyaman: | z+ma=ge=du | har-u |
| ● Taketomi Yaeyaman: | maa=i=du | har-i=ja |
| ● Shiraho Yaeyaman: | za=go=du | ng-o |
| ● Yonaguni: | nma=nki | hir-u=ŋa |
| ● Gloss: | where=to(=FOC) | go-PRS(=Q) |
| ● Translation: | Where are you going? | |

Endangered Status

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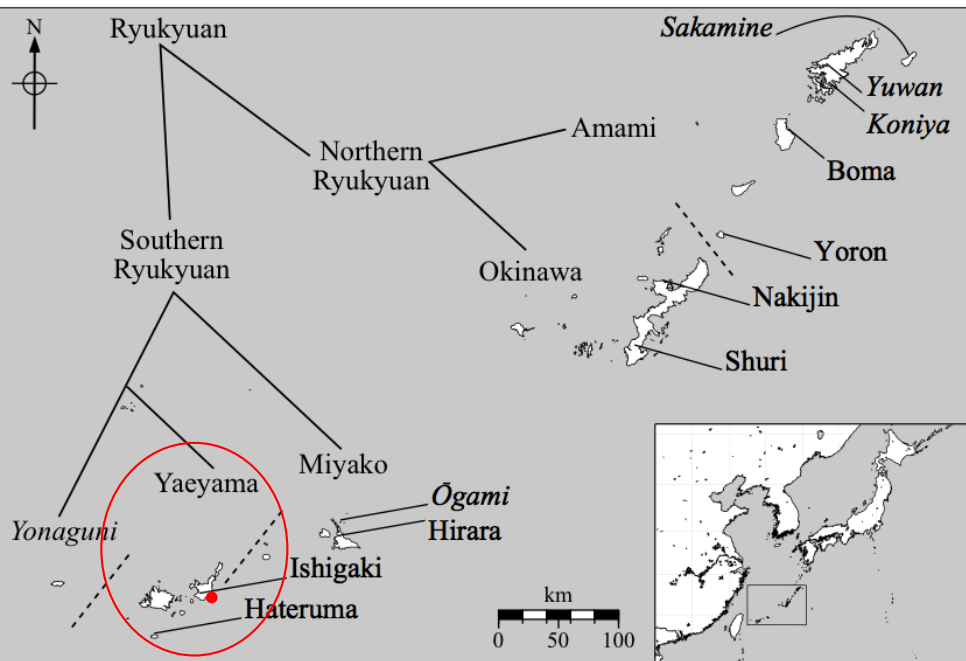
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- Youngest speakers of most languages 70-80
- A few have speakers as young as 40 (Miyara)
- Difficult to make exact count of number of speakers, due to difficulty of division between language and dialect and no surveys of who is a speaker
- **No children are learning the language**
- However, an Okinawan language nest has opened in Naha, the capital of Okinawa Prefecture



Profile of Shiraho

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- Native name *Ssabu-muni*
- Spoken in Shiraho Village in southeast part of Ishigaki Island
- Most speakers are over 80
- Estimating from the population of Shiraho Village (1,580) and population over 75 in ishigaki District (Ishigaki City, 2010), a healthy estimate is ~120 speakers
- Likely split from Hateruma ~240 years ago

Map of Yaeyama Islands

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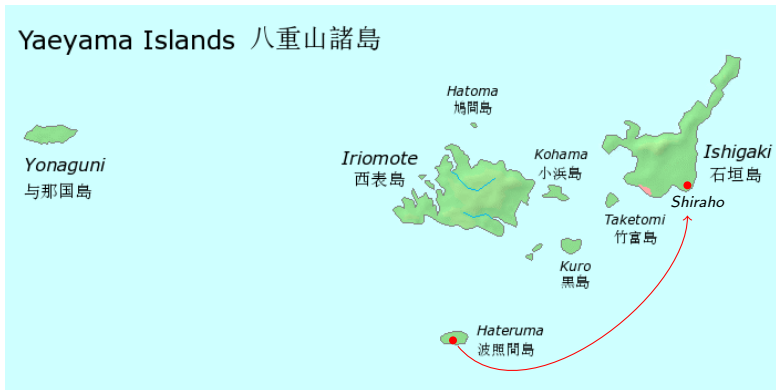
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Phoneme Inventory

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Consonants

| | Bilabial | Dental | Alv/Pal | Velar | Glottal |
|-------------|----------|---------------|---------|-------|---------|
| Stop | p, b | t, d | | k, g | |
| Fricative | ɸ | s ~ ɸ, z ~ dʒ | | | h |
| Affricate | | ts ~ tɸ | | | |
| Nasal | m | n, (ŋ) | | ŋ | |
| Flap | | | r ~ r | | |
| Approximant | w | | j | | |

Adapted from Aso (2010)

Vowels

| | Front | Central | Back |
|------|-------|---------|------|
| High | i | (ɨ) | u |
| Mid | e | | o |
| Low | | a | |

Pitch Accent

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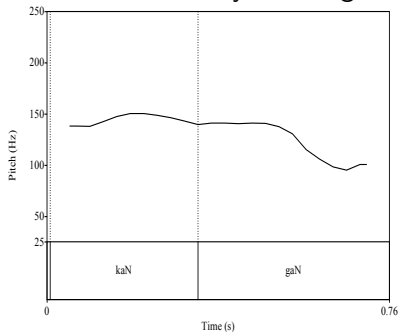
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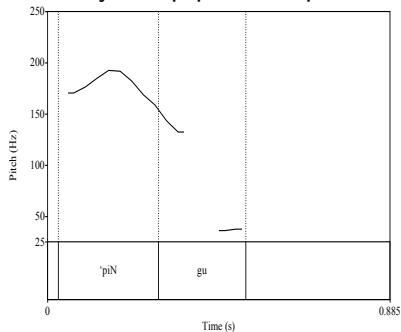
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- Shiraho has a simple register system
- Atonic: relatively flat contour
- Tonic: first syllable high, followed by sharp pitch drop



[kʰaŋgaŋ] 'mirror'



[pʰiŋ'gu] 'soot'

Relevant Phonological Rules

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- Morpheme-initial voiceless obstruents are aspirated
- Tonic word with ($\#/-$)T \checkmark T \checkmark V:

- Nothing
- The vowel devoices and pitch accent shifts right
- The second consonant voices

T \checkmark T \checkmark V
T \checkmark T \checkmark V
T \checkmark V \checkmark DV

- If replace second T with /m,n,r/ in tonic word

- Nothing
- Vowel & sonorant devoice, pitch accent shifts right

T \checkmark SV
T \checkmark S \checkmark V

- Atonic words with the same environments have optional devoicing
- Devoicing also appears to occur in (some) high vowels following non-initial voiceless stops

(#/ -)TVTV sequences in tonic words

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| UR | Nothing | Dev+Shift | Voice |
|---|--------------------------|-----------------------------|----------------------------|
| /pa'si-ka/ '20th day' | [p ^h a'si-ka] | [p ^h ᵛsi-ka'] | - |
| /e'ni-k ^h a'ta/ 'way of saying' | - | [e'nik ^h ᵛata'] | - |
| /ki'pari-ami/ 'mist' | - | [k ^h iᵛpa'riami] | [k ^h i'bariami] |

(#/-)TVSV sequences in tonic words

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| UR | Nothing | Dev+Shift |
|------------------------|-------------------------|------------------------|
| /sɨ'nu/ 'yesterday' | [s ^(h) ɨ'nu] | [s ^h ɨ̃nu'] |
| /pi'ra/ 'spatula' | - | [p ^h ĩra'] |
| /sa'no/ 'didn't do' | [s ^(h) a'no] | - |

Atonic Words

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| UR | Nothing | Devoice |
|-----------------------|------------------------|-------------------------|
| /tanumi/ 'request' | [t ^h anumi] | [t ^h an̥umi] |
| /kutarō/ 'came' | [k ^h utarō] | [k ^h u̯tarō] |

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- $*\acute{V}_o$: Undominated, voiceless segments cannot carry tone
- Three lower constraints working against one another
 - $*T^hVT$: Language independent, phonetically motivated by **heavy aspiration** on T^h spreading to vowel alongside devoicing between two voiceless stops
 - $IDENT_{IO} (C, VOI)$: Faithfulness of consonant voicing
 - $ALIGN-L$: Pitch accent must be as far left as possible

OT Example

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| Input: /pa'tu/ 'dove' | | *Ÿ | *T ^h VT | IDENT-IO (C, VOI) | ALIGN-L |
|--------------------------|------------------------------|----|--------------------|-------------------|---------|
| a. | p ^h a'tu | | *! | | |
| b. | p ^h at <u>u</u> ' | | | | * |
| c. | p ^h a'du | | | *! | |

| Input: /tu'siki/ '10 months' | | *Ÿ | ALIGN-L | IDENT-IO (C, VOI) | *T ^h VT |
|---------------------------------|--------------------------------|----|---------|-------------------|--------------------|
| a. | t ^h u's <u>i</u> ki | | | | * |
| b. | t ^h u <u>s</u> i'ki | | *! | | |
| c. | t ^h u'z <u>i</u> ki | | | *! | |

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| Input: /ki' pari-ami/ 'mist' | *V̥ | *T ^h VT | IDENT-IO (C, VOL) | ALIGN-L |
|--|-----|--------------------|-------------------|---------|
| a. k ^h i'pariami | | *! | | |
| b.  k ^h i̇pa'riami | | | | * |
| c. k ^h i'bariami | | | *! | |

| Input: /ki' pari-ami/ 'mist' | *V̥ | *T ^h VT | ALIGN-L | IDENT-IO (C, VOL) |
|---|-----|--------------------|---------|-------------------|
| a. k ^h i'pariami | | *! | | |
| b. k ^h i̇pa'riami | | | *! | |
| c.  k ^h i'bariami | | | | * |

Why the variation?

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- By far, devoice and shift is most common fix
- Why the other two fixes?
- Diachronic?

Macro-Yaeyama Subfamily

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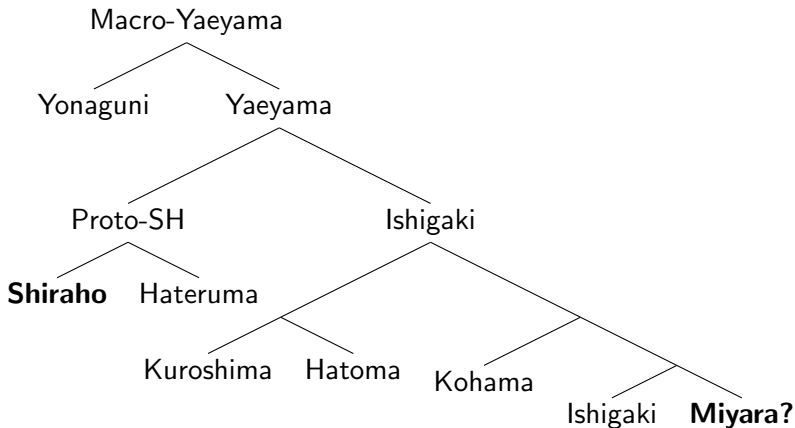
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Modified from Kajiku (1984, 300)

Voicing as a Fix

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- Voicing may be related to process of **medial voicing**
- Compare forms from related varieties

| Gloss | Shiraho | Hateruma | Miyara | Ishigaki |
|--------------|------------------|----------|-----------|----------|
| 'groom' | mugu | mugu | muku | muku |
| 'potato' | anga | agan | akkon | akkon |
| 'to be warm' | nugu- ζ an | noo-san | nuku-hoon | nus-saan |

- However, the voicing of /ki'pari-ami/ as [k^hi'bariami] is at odds with **fortition following voiceless obstruents**

| Gloss | Shiraho | Hateruma | Miyara | Ishigaki |
|-----------|---------|----------|--------|----------|
| 'to play' | asupun | asupun | asabun | asabun |
| 'paper' | kapi | kapi | kabi | kabi |

- Unclear exactly what is going on...

Lack of Devoicing + Shift

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- From my knowledge, very few words with target environment do not undergo devoicing and shift
- **Argument:** The holdouts are words with historically long initial vowels
- First, let's look at the question of vowel length distinction

Vowel Length Distinction

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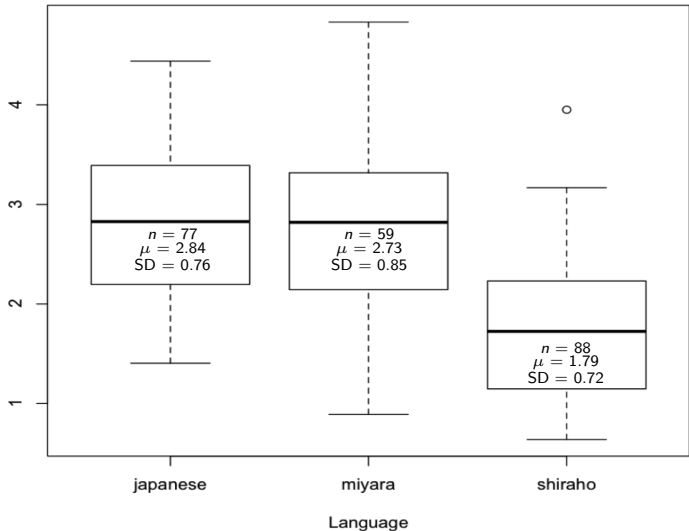
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- In Lau (2013), I argue there is no vowel length distinction
- Phonetic test compared ratio of duration of “long” to “short” vowels in Shiraho with ratio in Miyara Yaeyaman and Japanese, two languages with vowel length distinction
- ANOVA showed significant effect of language on ratio of “long” to “short” vowels ($F_{2, 222} = 46.18, p < .001$)
- Posthoc Tukey’s HSD showed:
 - Shiraho - Miyara $[p < .001]$
 - Shiraho - Japanese $[p < .001]$
 - Miyara - Japanese $[p = 0.71]$

Means and Standard Deviations of Ratios by Language



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Levene's Test for Homogeneity of Variance

($F_{2, 222} = .738, p = .4792$)

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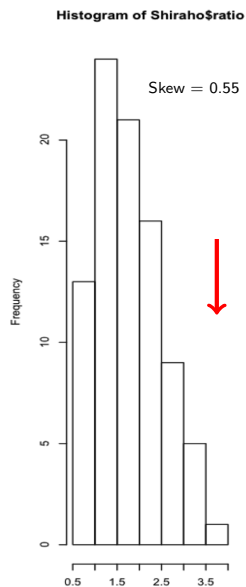
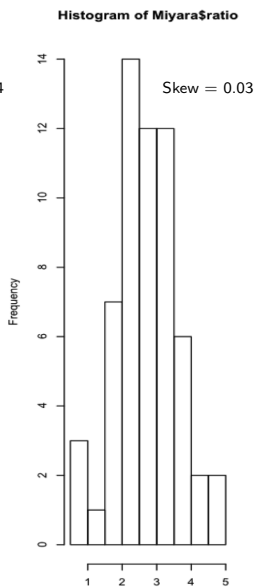
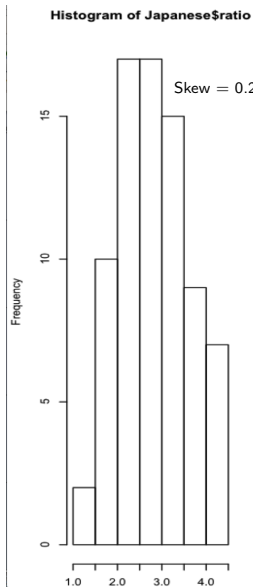
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Retention of Long Vowels

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- In Lau (2013), I note that many of these tokens that are causing skews are basic vocabulary or proper nouns
- Some are surrounded by voiced consonants
 - *maaza-on* ‘name of a shrine’
 - *buu-nan* ‘large wave’
- Some are in the proper environments for devoicing + shift
 - *puurin* ‘harvest festival’
 - *tuu-siki* ‘ten months’
 - *kaara* ‘river’

- Nakagawa (2013): Morpheme boundary prevents devoicing
 - *s̄ana* 'umbrella'
 - *s-a'-no* 'don't do'
- However, could be retention of historically long vowels in commonly used words (cf. Miyaran *ha-a'-nu* 'don't do')
- Also, as pointed out by (Nakagawa, 2013), /e/ and /o/ are never devoiced
 - I believe historically diphthongs: < *ai/*ia, *au/*ua
 - Shiraho -e : Hateruma -ja 'perfect particle'
 - Shiraho *peri* : Miyara *pairu* 'vinegar'
- Note that devoicing occurs in Japanese borrowings
 - *t̄oku*'=*ni* 'especially'
 - *t̄ocu*' 'on the way'

Another look at orthography

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- The following chart summarizes the number of times a long vowel occurs in the n^{th} syllable of a word

| Syllable # | Shiraho | Miyaran |
|--------------|---------|---------|
| 1 | 246 | 617 |
| 2 | 25 | 354 |
| 3 | 24 | 210 |
| 4 | 8 | 115 |
| 5 | 1 | 47 |
| 6 | 2 | 28 |
| 7 | - | 16 |
| 8 | - | 16 |
| 9 | - | 4 |
| 10 | - | 6 |
| Total tokens | 1425 | 3811 |

- Most long vowels past syllable 2 are initial vowel of separate word
- Further proof of lack of distinction
- Lack of long vowels even in syllable 2 suggests pitch accent may not have shifted

Comparison of Device + Shift VS Voicing

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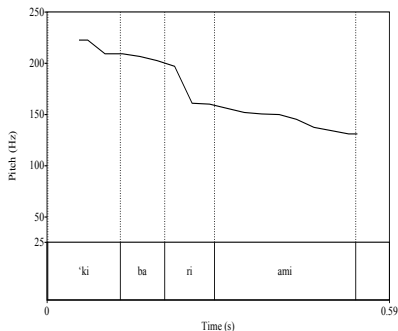
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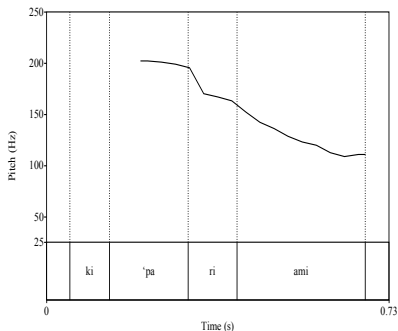
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[kʰi'bariami] 'mist'



[kʰipa'riami] 'mist'

- Then we can say $*\check{V}$ is not a constraint and IDENT_{IO} (voi) is free to refer to both vowels and consonants without harmonic bounding problem

Conclusions and Further Questions

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- Phonological rule devoicing vowels between aspirated stops and voiceless stops becoming increasingly productive
- Holdouts are basic vocabulary words with historically long vowels. These show both:
 - Retention of long vowels
 - Lack of devoicing
- Corpus data suggests pitch accent shift may be an auditory illusion as the “new nucleus” does not appear to often be longer
- Need to look at phonetic quality of words that undergo this phonological devoicing rule

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