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THE PROSODIC STRUCTURE OF PAZEH

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Table of Contents

PREFACE

The 26th Annual Meeting of the Austronesian Formal Linguistics Association (AFLA 26) was held on May 24-26, 2019 at the University of Western Ontario (Canada). The programme consisted of 24 presentations in addition to four plenary talks by Juliette Blevins, Vera Hohaus, Marian Klamer and Becky Tollan. This volume includes 13 papers from the conference.

As conference organizer, I received generous support from a variety of sources. Financial support came from the Social Sciences and Humanities Research Council of Canada (SSHRC), Research Western, the Joint Fund (Research Western, SOGS, SGPS), the Theoretical and Applied Linguistics Lab, the Canadian Linguistic Association, the Faculty of Arts and Humanities, the Graduate Program in Linguistics and three departments (French Studies, Modern Languages and Literatures, and Anthropology). The conference would not have been possible without the student volunteers (Sonia Masi, William Tran, Caylen Walker and Kang Xu), plus several others who helped out at the registration desk. Finally, I am grateful to the Department of French Studies for administrative support.

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THE PROSODIC STRUCTURE OF PAZEH*

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This paper presents novel data on the prosody and intonation of Pazeh, an Austronesian language of Taiwan thought to have lost its last speaker in 2010. The discovery of at least one additional speaker has allowed for continued documentation of the language. Here, I present an Autosegmental-Metrical analysis of Pazeh, with relevant discussion of the phonetics of word-level prosody.

1. Introduction

Pazeh and Kaxabu are two varieties of a Formosan language (Pazeh-Kaxabu) originating in the western plains of Taiwan. Pazeh and Kaxabu share some mutual intelligibility, but differ in vocabulary as well as in structure, one notable example being the loss of *r in all positions in Kaxabu (Ferrell 1970, 74). Pazeh-Kaxabu may be part of a Western Plains subgroup of Austronesian (Li 2003). The language is currently spoken in the city of Puli: the Pazeh villages are on the Ailan Plateau and the Kaxabu villages are north-east of the Meixi Stream.

Kaxabu has a handful of remaining speakers, listed in Lim 2016 (p.3). Pazeh was thought to have lost its last speaker in 2010 (Li 2010), after the death of Pan Jin-yu, the sole informant to a number of works on Pazeh (cf. Blust 1999, Lin 2000, Li 2000; 2013, and Li and Tsuchida 2001, among others). However, at least one speaker of Pazeh exists: Pan Mei-yu, a distant niece of Pan Jin-yu. Pan Mei-yu is the author of Adunuʔ 2017, who now studies Pazeh academically and is active in the language's revitalization movement. The data presented in this paper were collected during three trips to the field, in July 2016, January 2017 and June 2018, yielding a total of seventeen hours of audio recordings.

The segmental phonology of Pazeh has been previously described in a number of works, such as Ferrell 1970, Blust 1999, Lin 2000, and Li and Tsuchida 2001. Pan Mei-yu's synchronic grammar differs from these descriptions in a number of ways. Some such differences, for example the merger of /d/ and /l/, and the fortition of word-final fricatives to stops, are shared by Kaxabu speakers like Phuann Ing-lik (first/original author of Kunay 2015), and may be expected inter-

*I give my heartfelt thanks to Pan Mei-yu and Phuann Ing-lik for sharing Pazeh and Kaxabu with me. I would also like to thank the audiences of 14-ICAL and AFLA 26, and three anonymous AFLA reviewers, for their valuable feedback, as well as Lisa Travis, Daniel Kaufman and Juliette Blevins for their discussion and advice. All errors remain my own.

nal developments given the endangerment status of the language.[1] Much less description exists of Pazeh's suprasegmental phonology. This paper seeks to (i) describe the prosodic structures underlying Pan Mei-yu's synchronic grammar in an Autosegmental-Metrical model (Pierrehumbert 1980); and (ii) compare these structures with existing descriptions of prosody elsewhere in Austronesian. The remainder of this paper is structured as follows: Section 2 presents the synchronic data and analysis, and Section 3 presents comparative data from Austronesian and contact languages.

2. Prosodic Structure in Pazeh

This section presents synchronic patterns in the prosodic phonology of Pazeh, based on data elicited from Pan Mei-yu. These patterns fall into four categories: defining the prosodic phrase, phonologically and syntactically (2.1); the assignment of prominence to syllables that are not domain-final (2.2); intonational phonology (2.3); and a discussion on the phonological structure of prosodic phrases showing multiple prominent syllables (2.4).

2.1. Prosodic Phrasing

Each prosodic phrase includes at least one prominent syllable. The domain of stress- and tonal assignment in Pazeh will be labeled in this paper as the intonational phrase (IP), following Pierrehumbert's (1980) model of English intonation. Each IP in Pazeh has at least one prominent syllable. Prominent syllables are marked with raised intensity and the alignment of a *HL tonal melody. The last syllable in the IP is always prominent (noted in this section with an acute accent).

IP's in Pazeh can be a single phonological word, including all affixes, or a complex phrase, like the first IP in (1):[2]

[1]Dorian (1981) proposes that two types of language change are expected preceding 'language death': transfer from dominant languages, and simplification of some structure. Both the merger of /d/ with /l/ and the fortition of word-final fricatives (merging with stop categories) are examples of the latter. Note that while Dorian 1981 and other works of that era refer to 'language death', this label does not describe Pazeh-Kaxabu's current state, nor necessarily its (presumed) future state. However, due to the loss of native speakers and isolation of remaining speakers, the same types of structural changes as documented by Dorian are expected—and found—in Pazeh-Kaxabu. Statements about Phuann Ing-lik's synchronic grammar are based on three hours of collected data from January 2016, as well as archival recordings published with Kunay 2015.

[2]Data presented in this paper in italics, or within diagrams of prosodic structure, will be transcribed as found in Li and Tsuchida 2001, unless otherwise noted. Notable ways in which this transcription deviates from IPA include [y] for the palatal glide, [ng] for the velar nasal and [e] for schwa. Some words have been re-transcribed within examples with glides or high vowels where Li and Tsuchida have the reverse, in order to show syllable structure according to this paper's analysis of Pan Mei-yu's synchronic grammar.

(1) [IP imini a rumux ká] [IP dumangaxúx]
this LIG meat TOP fragrant
"This meat is fragrant."

While this approach assigns stress directly to the final syllable of the IP, Blust (1999, 332) provides an alternative: stress is underlyingly on the last syllable of the stem, and if suffixes are added, a 'stress shift' rule moves stress to the ultima. This model aids comparison with other Austronesian languages with more complex stress patterns, such as Thao, in which stress placement is sensitive to morphological features, and thus does not occur in a fixed position relative to prosodic domain boundaries (Blust 2003, 35–9). As the focus in this paper is synchronic, I adopt the simpler explanation, that stress is assigned at the IP level.

Some particles always join the IP of preceding material, for example the locative particle *di* and the topic marker *ka*:

(2) [IP kuang dí] [IP dalúm]
outside LOC water
'out of the water'

(3) [IP ayam ká] [IP tabarák]
bird TOP yellow
"The bird is yellow."

Other particles always join the IP of the material following them, for example the 'ligature'[3] *a* and the case marker *ki*:

(4) [IP adáng] [IP a takayáh]
one LIG frog
'one frog'

(5) [IP mu-xe'et nuáng] [IP ki yakú]
AF-bind cow 1sg
"I bind a cow."

Prosodic domain boundaries may be misaligned with syntactic structure in Pazeh. For example, the locative particle *di* forms a syntactic constituent with following material, but a prosodic domain with preceding material. This results in prepositional phrases interrupted by prosodic boundaries. For example, in (6), [*kuang di*] is a prosodic constituent, but not a syntactic constituent:

[3]The term 'ligature' for Pazeh *a* is from Li (2000, 96). This particle links two nouns in genitive constructions, or relative clauses with head nouns.

(6) [$_{AP}$ kuang [$_{PP}$ di [$_{DP}$ dalum]]] *Syntactic structure*
[$_{IP}$ kuang dí] [$_{IP}$ dalúm] *Prosodic structure*
outside LOC water
'out of the water'

Two words in Pazeh are optionally extrametrical: the perfect aspect marker *lia* and the question marker *sai*. Both words are found sentence-finally. When an extrametrical word is present, stress falls on the previous syllable:

(7) [$_{IP}$ purehát] <lia>
die PERF
"It died."

(8) [$_{IP}$ ayam ká] [$_{IP}$ tabarák] <sai>
bird TOP yellow Q
"Is the bird yellow?"

2.2. Prominence on Non-Final Syllables

All IP's in Pazeh have stress on the final syllable. In some cases, stress/tonal alignment fall both on the final syllable and on an additional syllable. Non-final stress can fall anywhere in the IP, including on the penult (adjacent to the final stress).

Non-final stress always occurs on long vowels, /ai/, and /au/. For example, *aidini* 'here' contains stress both on the final syllable, and on the initial syllable (due to the /ai/ sequence). The metrical structure of *aidini* is shown in (9):[4]

(9)
x		x	
x	x	x	
ai	di	ni	'here'

Note that the structure in (10), which yields final but not initial stress, is ungrammatical:

[4]Metrical structure in this paper will be shown as unbracketed metrical grids, where relative prominence is represented by the number of *x*'s above each syllable. Metrical grids allow for the description of data that do not fall neatly into foot types (Prince 1983), which is necessary for the analysis in this paper. While there are arguments for 'bracketed grids' with more complex structure (Halle and Vergnaud 1987), bracketed foot structure does not affect the analysis in this paper, and will be omitted. This section will limit metrical structure to two levels of prominence; the possibility of a third will be discussed in Section 2.4.

(10) *

		x	
x	x	x	
ai	di	ni	‘here’

Similarly, the word *kiaaren* ‘beautiful’ contains a vowel sequence in the first syllable. Thus, both syllables are prominent:

(11) a.

x	x	
x	x	
kiaa	ren	‘beautiful’

b. *

	x	
x	x	
kiaa	ren	‘beautiful’

Affixation can also create sequences that trigger non-final stress assignment. Li and Tsuchida (2001, 41) analyze *mausay* ‘will go, am going’ as *m<a>-usa-ay* ‘<PROG>AF-go-IRR’. The /a/ of the infix and /u/ of the stem combine to form a tautosyllabic /au/ sequence. The syllable with this sequence is stressed:

(12) a.

x	x	
x	x	
ma-u	sai	‘AF-go.IRR’

b. *

	x	
x	x	
ma-u	sai	‘AF-go.IRR’

CVV-reduplication, which is used as a progressive marker (Li and Tsuchida 2001, 39), also results in an initial stressed syllable:

(13) a.

x		x	
x	x	x	
laa-	la	ngui	‘PROG-swim’

b. *

		x	
x	x	x	
laa-	la	ngui	‘PROG-swim’

Notably, while syllables with /ai/ and /au/ sequences are stressed, non-final syllables with /ia/ and /iu/ sequences are not stressed. Coda consonants (sonorants included) in non-final syllables also do not co-occur with stress:[5]

(14) a.

	x	
x	x	
sia	tu	‘clothing’
sua	di	‘younger brother’
ring	xau	‘porridge’

b. *

x	x	
x	x	
sia	tu	‘clothing’
sua	di	‘younger brother’
ring	xau	‘porridge’

There is one case where a non-final syllable with an /ai/ sequence does not surface with stress. The word *aisiiyay* ‘resemble’ has three syllables which are all candidates for stress.

[5]Of course, syllables with /ai/, /au/ or a long vowel followed by a coda consonant may be expected to surface with stress. However, no words in Li and Tsuchida 2001 nor in the data I have elicited contain such a sequence. Nor are there roots beginning with VCC, which would create a similar environment when prefixed (cf. the vowel sequence in *m<a>-usa-ay* in (12)).

(15) a.

	x	x	
x	x	x	
ai	sii	ai	‘resemble’

b. *

x	x	x	
x	x	x	
ai	sii	ai	‘resemble’

As *aisiiyay* is the only word in the data elicited for this paper that contains three potential sites for stress, it cannot be determined with the current evidence whether the lack of initial stress on *aisiiyay* is due to a constraint on three continuous stresses, a limit of two stresses within the intonation phrase, or a constraint against three strong syllables within a foot.

In sum, /ai/, /au/ and long vowels attract stress while /ia/, /ua/ and short vowels do not. One analysis that would account for these facts is to posit that high vocoids become glides before a (non-identical) vowel, and that stress is assigned to all syllables with a nucleus of the shape VV (including long vowels and vowel sequences). Thus, the /i/ in *siatu* ‘clothing’ and the /u/ in *suadi* ‘younger brother’ are realized as glides [j] and [w], and are thus part of the onset, and not the nucleus, making them invisible to the stress assignment rule. When a high vocoid precedes a long vowel (e.g. *kiaaren* ‘beautiful’), this long vowel remains in the nucleus after glide formation occurs, and still attracts stress, as seen in (11). Sample derivations can be seen in (16):[6]

(16)

/aidini/	/siatu/	/kiaadən/	/aisiiai/	UR
–	sjatu	kjaaden	–	Glide Formation
ai.di.ni	sja.tu	kjaa.dən	ai.sii.ai	Syllabification
ai.di.ní	sja.tú	kjaa.də́n	ai.sii.ái	Final Stress
ái.di.ní	–	kjáa.dən	ái.síi.ái	Stress → VV
–	–	–	ai.síi.ái	**ó ó ó*
[ái.ɾi.ní]	[ʨja.tú]	[kjáa.ɾən]	[ai.ʨíi.ái]	Surface
aidini	*siatu*	*kiaaren*	*aisiiyay*	Li and Tsuchida 2001
‘here’	‘clothing’	‘beautiful’	‘resemble’	Gloss

This analysis, while accounting for the patterns in Pan Mei-yu’s synchronic grammar, runs contrary to the analysis of vocoids in Blust 1999 (pp.329–30). Blust distinguishes vowel-glide sequences like /aw/ in *saw* ‘person’ from vowel-vowel sequences like /au/ in *tibaun* ‘mosquito’. In the data Blust presents, vowel-vowel sequences are found in closed syllables while vowel-glide sequences are found in open syllables. Thus, the data presented in Blust 1999 (and that presented in Li and Tsuchida 2001) are compatible with an analysis whereby glides [j] and [w] are underlyingly /i/ and /u/, having undergone glide formation.

[6]Underlying representations given in (16) are meant to represent structures in Pan Mei-yu’s lexicon, which contains some differences in the segmental phonology from that of Pan Jin-yu, consultant for Blust (1999) and Li and Tsuchida (2001) among others. For example, /r/ has been merged with /d/, as reflected in *kiaaren* /kiaaden/ ‘beautiful’. Segmental rules that do not affect metrical structure (such as flapping and palatalization) are outside the scope of this paper and are thus omitted from these derivations.

Where the analysis in this paper is incompatible with the data elicited by Blust (1999), Li and Tsuchida (2001), and other scholars working with Pan Jin-yu, is that the /ay/ and /aw/ sequences described by Blust (1999) would result in a short vowel in the nucleus, and thus fail to attract stress in non-final syllables. Whether this was the case in Pan Jin-yu's speech, or whether syllables with /ay/ and /aw/ attracted stress, can now only be speculated on.[7] What can be done now is to find the best model for data elicited from Pan Mei-yu, and compare the structures this model is composed of to those in past descriptions and elsewhere in Austronesian (to be done in Section 3).

2.3. Intonational Phonology

The intonational phonology of Pazeh, as spoken by Pan Mei-yu, contains two main phonological elements: a %L boundary tone and a *HL pitch accent melody.

The %L boundary tone is anchored to the beginning of the intonational phrase. If the first syllable of the IP is stressed, %L is deleted.

The *HL melody is anchored to all stressed syllables. If the stressed syllable is followed by an unstressed syllable, the L of the *HL melody associates with the unstressed syllable. If the stressed syllable is followed by another stressed syllable (which recieves its own *HL), the L of the (first) *HL melody is deleted. On a final syllable, the full *HL is realized unless the syllable has a voiceless coda.[8]

The examples that follow illustrate the behavior of %L and *HL:

(17) %L *HL → %L *HL *mu-languy* 'AF-swim'

[IP mu la ngwí] → [IP mu la ngwí]

In (17), the boundary tone %L associates to the first (toneless) syllable of the intonational phrase. A *HL pitch accent associates to the final syllable of the IP. Since the final syllable, [ŋwi], does not end in a voiceless consonant, the full melody is realized on that syllable (cf. the annotated pitch track can be seen in Figure 1).[9]

(18) ~~%L~~ *HL *HL → *H L *HL *laa-languy* 'PROG-swim'

[IP láa la ngwí] → [IP láa la ngwí]

[7]It is, of course, possible that more evidence for the prosodic structures in Pan Jin-yu's grammar exist within archival recordings.

[8]In Pan Mei-yu's speech, voiceless codas include /p/, /t/, /k/, and /ʔ/. Pan Jin-yu's speech also has /s/, /x/, and /h/ codas. However, in Pan Mei-yu's grammar, /x/ and /h/ have merged in all positions, and word-final fricatives /s/ and /h/ have fortited to stops /t/ and /ʔ/. A lack of word-final fricatives is also present in the Kaxabu of Phuann Ing-lik.

[9]Pitch tracks created in Praat (Boersma and Weenink 2017).

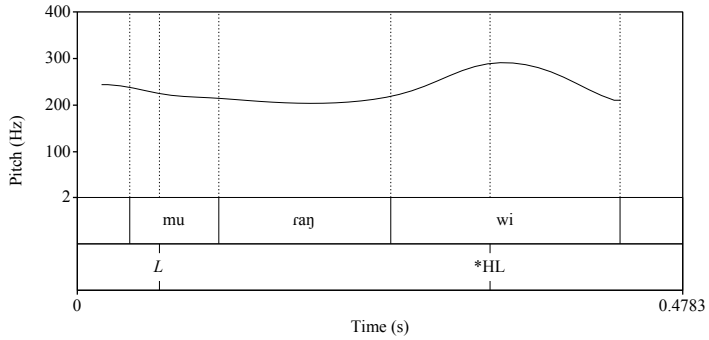

Figure 1: Pitch track of a production of *mu-languy* [mu.ɾa.ŋwí] 'AF-swim' by Pan Mei-yu.

Example (18) shows the same root as that in (17), but with the CVV-RED prefix whose long vowel attracts stress to the first syllable. Here, since the first syllable has a pitch accent, the boundary %L is deleted. *HL is assigned to both the first syllable (with the long vowel) and the final syllable. The L of the initial syllable's *HL pitch accent shifts to the toneless second syllable (cf. pitch track in Figure 2).

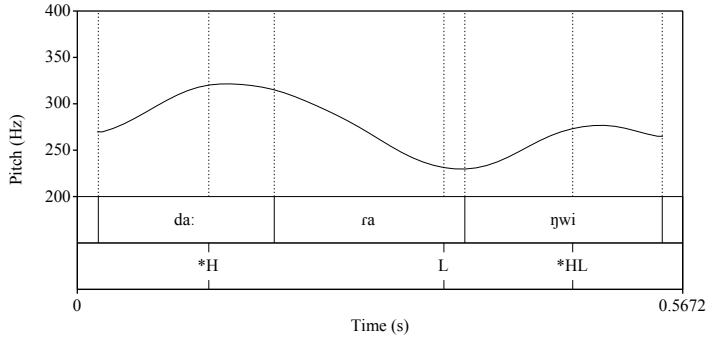

Figure 2: Pitch track of a production of *laa-languy* [dáː.ɾa.ŋwí] 'PROG-swim' by Pan Mei-yu.

(19) %L *H L → %L *HL *takayah* 'frog'

[IP ta ka yáʔ] → [IP ta ka yáʔ]

(19) shows a case where the final syllable ends with a voiceless consonant, /ʔ/ in Pan Jin-yu's speech from /h/ in Pan Jin-yu's speech and historically. Because

of this, the L tone of the *HL pitch accent is deleted, and only *H is realized on the final syllable (cf. pitch track in Figure 3):

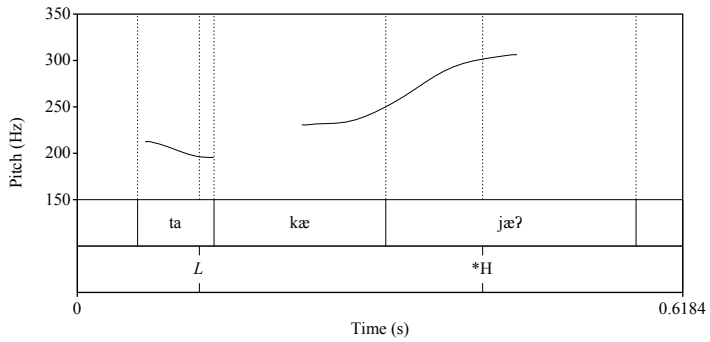

Figure 3: Pitch track of a production of *takayah* [ta.ka.jáʔ] ‘frog’ by Pan Mei-yu.

(20) ~~%L~~ *H~~L~~ *HL → *H *HL *kiaaren* ‘beautiful’

[IP kjáa rén] → [IP kjáa rén]

When there are pitch accents aligned to adjacent syllables, the L of the first *HL pitch accent melody is deleted. This can be seen in (20), along with the pitch track in Figure 4 below, which lacks the ‘dip’ between the syllables seen in Figure 2.

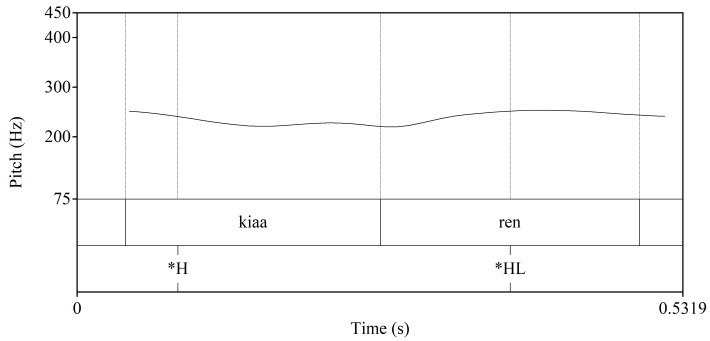

Figure 4: Pitch track of a production of *kiaaren* [kjáː.ɾə́n] ‘beautiful’ by Pan Mei-yu.

2.4. Does Pazeh Have Secondary Stress?

Final stress in Pazeh is present in all intonational phrases, while only some IP's have non-final stress. This raises the question of whether there is a distinction in prominence between the two types of stress: that is, is one 'primary stress' and the other 'secondary stress'?

The fact that final stress is always present may indicate its likelihood as primary stress. Of the descriptions of secondary stress in Formosan, none describe a system where the primary stress is in a different position within the IP based on the presence of a second stress. For example, primary stress in non-imperatives in Tungho Saisiyat is always on the ultima, while words of three or more syllables have initial secondary stress (Zeitoun et al. 2015, 39). Pan (2012, 35–6) describes something similar in Saaroa, in which primary stress is always on the penult or antepenult, but secondary stress is always initial, occurring in words of four or more syllables. Zeitoun (2007, 26) describes primary stress in Mantauran Rukai as word-initial, with secondary stress later in the word when present.

However, the presence of such systems elsewhere in Formosan is not synchronic evidence of a primary-secondary stress distinction in Pazeh. The presence of stress in a 'uniform' position does not require that stress in this position is primary: Pater (2000, 237) gives examples of morphological alternations in English which preserve the position, but not magnitude, of prominence (e.g., *ímágine* versus *imàginátion*).

Synchronic phonological evidence does not give a clear picture of whether the two types of Pazeh stress differ in magnitude. Both types of stress are assigned the same *HL melody, for instance. Thus, any evidence for a primary vs. secondary stress in Pazeh will likely come in the form of a difference in magnitude of phonetic cues.

Many elicited items with both types of stress show little difference in the height of the two pitch peaks. For example, Figure 5 shows a pitch track of *aididua* 'there', which has stress on both the first and last syllables. Each stress has a pitch peak (due to the *HL), and the peaks are at a comparable height.

Some elicited items, however, have a higher pitch peak on the non-final stress, as was seen in the production of *laalanguy* in Figure 2. This is unexpected if the non-final stresses in Pazeh are secondary stress. This raises the question of whether the higher pitch peak on the non-final stress is indicative of a higher prominence relative to the final stress. If so, then Pazeh distinguishes three levels of prominence, and words like *laalanguy* have the metrical structure shown below in (21a). Otherwise, if the difference in peak height is due to some phonetic reason and not a difference in phonological structure, then *laalanguy* has the structure shown in (21b):

(21) a.

x			
x		x	
x	x	x	
laa-	la	nguy	'PROG-swim'

b.

x		x	
x	x	x	
laa-	la	nguy	'PROG-swim'

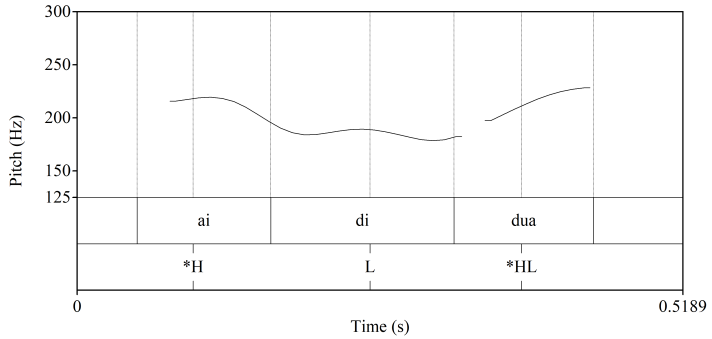

Figure 5: Pitch track of a production of *aididua* [ái.ri.rwá] 'there' by Pan Mei-yu.

One place to look for evidence disambiguating the two is words with multiple intonational phrases. Example (22) contains three IP's (and one extrametrical particle).

(22) [$_{IP}$ yakú] [$_{IP}$ kan-én] [$_{IP}$ dadás] <lia>
1sg eat-PF sweet.potato PERF
"I ate a sweet potato."

As can be seen in Figure 6, the peak of the first pitch accent is higher than the other pitch accents.

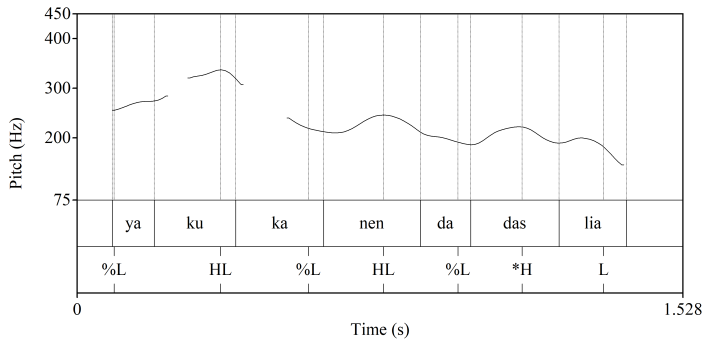

Figure 6: Pitch track of a production of *yaku kanen dadas lia* "I ate a sweet potato." by Pan Mei-yu.

One possible explanation for the relative heights of the pitch peaks is declination, or 'downdrift', which occurs on sequences of H tones, especially when L tones intervene. Lindau (1986) describes the phonemenon in Hausa. Since Hausa has lexical tone, the tone expected on each syllable is known, and the difference in

relative pitch peaks does not correspond to a difference in phonological category (as all belong to /H/). An example of declination in Hausa is shown in Figure 7.

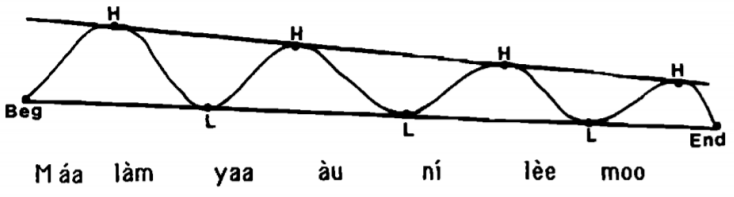

Figure 7: Declination in the maxima of /H/ pitch peaks in Hausa, from Lindau (1986, 758).

Although it is possible that the difference in pitch peak magnitude in Pazeh is due to declination, the pitch peaks in Figure 7 decline at a steady rate, while the Pazeh pitch track in Figure 6 shows a large difference in magnitude between the first peak and all the others. This would suggest that the especially-high first peak is indicative of a third level of prominence, like the structure in (21a).

As phrases with multiple prosodic groupings only show one extra-high tone, this tone must be assigned at a higher level in the prosodic hierarchy than where %L and *HL are assigned. Following the notation in Pierrehumbert's (1980) model of English intonation, we can divide the hierarchy in Pazeh into an intonational phrase (IP) where the extra-high *H is assigned, and below it the intermediate phrase (ip) where the low boundary -L and *HL pitch accent are assigned. A reimagining of example (22) under this model would look as follows:

(23) [$_{IP}$ *H]
[$_{ip}$ -L *HL] [$_{ip}$ -L *HL] [$_{ip}$ -L *H] L
ya kú ka nén da dás lia
"I ate a sweet potato."

Unlike Pierrehumbert's (1980) model of English, where boundary tones at the intonational phrase level combine with tones assigned at the intermediate phrase level in a sequential manner, the H element assigned to Pazeh intonational phrases combines with the H of *HL to form an extra-high peak. This is similar to approaches such as Snider 1988, which posits 'modal' and 'register' tonal tiers, whose elements combine to generate the surface tone level.

Another benefit to this analysis is that it is consistent with the variation in words produced in isolation (as having similar peaks vs. the first peak higher). If tokens of isolated words have a higher first peak, then both an intermediate and an intonational phrase were built; tokens with similar peaks only have the lower level of the hierarchy built. Productions of full sentences are not predicted to lack the IP level.

3. Comparative Data

Some of the features of Pazeh's prosodic system are typologically unusual, such as the availability of stresses on adjacent syllables, and the possibility of multiple non-'secondary' stresses in the word. This section seeks to explore these features from the perspective of what has been documented elsewhere in the Austronesian world, as well as discuss the plausibility of these features as contact effects.

3.1. Kaxabu

The closest relative to Pazeh is Kaxabu, the other dialect of the Pazeh-Kaxabu language. Lim (2016) analyzes the intonational phonology of Kaxabu, finding that stress is rhythmic, with iambs built from the end of the prosodic word. One example is *màxádàxédàxé* 'ghost' (where the acute accent refers to the pitch peak of prominent syllables, and the grave accent refers to the pitch minima of non-prominent syllables; p.106).

Pazeh's stress assignment, on the other hand, is not rhythmic. This can be seen in words with adjacent stressed syllables like *ai.síi.ái* 'resemble' and *kiáa.rén* 'beautiful'.

3.2. Formosan and Philippine Languages

Some of the typologically uncommon features of Pazeh prosody are attested in descriptions of other Formosan languages, as well as in Philippine languages, which are their closest relatives within Malayo-Polynesian (Wolff 1995).

Prosodic words with more than one non-secondary stress are uncommon cross-linguistically, but are attested elsewhere in Austronesian. For example, clitics bear an additional stress in the Philippine languages Balangao (Shetler and Fetzer 1964, 102) and Ilocano (Yamamoto 2017, 34). Some clitics act similarly in Pangasinan (Benton 1971, 27–8). Words also receive an additional stress based on length in Bakid (Atherton 1953, 103).

A similar phenomenon has been documented in Tsou (Formosan): disyllables have "unsteady" stress depending on the syllable weight of the penult (Huang 2003, 6). "Unsteady" stress has also been documented in Philippine languages such as Ilocano (Bloomfield 1942, 193), Karao disyllables (Brainard 1994, 9), and Ibaloi disyllables with a medial glide (Himes 1998, 125).

The attraction of stress to heavy syllables is common cross-linguistically, and is attested for the Formosan language Squliq Atayal (Rau 1992, 26). This feature is common enough among Philippine languages that Zorc (1979, 241) reconstructs a Stress-to-Weight rule for Proto-Philippines.[10]

[10]It has been argued that Philippine languages have no common ancestor more recent than Proto-Malayo-Polynesian, and thus there is no 'Proto-Philippines' (cf. Reid 1982). However, Stress-to-Weight rules are still common across Austronesian languages in the Philippines.

What is uncommon about Pazeh's Stress-to-Weight rule is that only vowel quantity affects stress assignment, not coda consonants (sonorants included). Gordon (1999, 23–4) claims that the most common syllable type to attract stress is closed syllables, i.e. those with a coda. Systems where codas do not attract stress, while vowel quantity does, are attested in Philippine languages, however. Stress is assigned to antepenults or penults unless they are closed syllables in Balangao (Shetler and Fetzer 1964, 104), Ilocano (Rubino 1997, 18) and Tagalog (Himmelmann 2005, 352). Similarly, penults are stressed unless they are closed syllables in Ibaloi (Himes 1998, 125), as are first syllables in Kalanguya (ibid., 131).

3.3. Contact Languages

Pan Mei-yu's synchronic grammar shows a number of features transferred from contact languages in the segmental phonology.[11] For example, the lack of coda fricatives is shared with Min, Japanese and Mandarin. Thus, it warrants discussion whether the features of Pazeh prosody described in this paper could themselves be the result of language contact.

None of the languages that have been in prolonged contact with Pazeh has a similar system of prominence. Min has no identifiable prominent syllable within the prosodic phrase (Du 1988, 201). Japanese marks prominence with a pitch accent melody, of which no one syllable is cued with increased duration or intensity (Pierrehumbert and Beckman 1988, 7).

Given the lack of parallels in prosodic structure between Pazeh and contact languages, it is clear that Pazeh's prosodic structures more closely resemble those of other Austronesian languages than those of its contact languages. Pazeh's prosodic structures also differ from typologically common structures in a number of ways, which makes them unlikely to be internal developments in late-stage speakers. Thus, the features described in this paper of Pazeh's prosodic system as spoken by Pan Mei-yu are most likely to be conservative, directly-inherited features of the language.

4. Conclusion

Many Formosan languages lack in-depth study of prosodic phonology and phrasing. What prosodic structures have been documented for Formosan languages have resisted reconstruction to Proto-Austronesian. However, analysis of Pazeh's prosodic phonology has shown that there are "Austronesian"-type prosodic structures, at least in the Formosan/Philippine area. This study also highlights the contributions to language documentation by late-stage speakers, and the issues that arise in linguistic research when so few speakers remain.

[11]The term 'contact languages' here refers to Taiwanese Southern Min, Japanese and Mandarin. Blust (1999) also notes evidence of contact between Pazeh and Taokas in the form of loanwords. As this contact occurred long before any late-stage changes to the language, I will omit contact with Taokas and other Formosan languages from this discussion.

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