

TONAL VARIATION IN PYEN

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Abstract

Several studies on the Tibeto-Burman Ngwi (Lolo) language family describe tone behavior in the framework of tonogenesis/historical reconstruction among the different languages, but synchronic tonal analyses are rare or are lacking in specifics. After laying out the phoneme inventory, this paper presents a look at the tone of Pyen, belonging to the Bisoid subgroup of Southern Ngwi, spoken in Myanmar. We focus especially on tone sandhi and phrase-final intonation. Its three contrastive tones, high, mid, and low, occur on every word type. Verbal suffixes differ from this pattern; they carry only the high or low tone, depending on the tone of either the preceding verb stem or any preceding tone-bearing suffix. A non-lexical intonational-phrase-final boundary tone is frequently used to express exclamation or emphasis, and is often found in conjunction with phrasal affixes indicating grammatical mood. This falling boundary tone is associated with a greater excursion of pitch than the low boundary tone found in neutral expressions.

Keywords: Tibeto-Burman, Southern Ngwi, phonology, tone, intonation
ISO 639-3 codes: pyy, bzi, lwm, pho

1 Introduction

Pyen is a Bisoid language of the Southern Ngwi¹ branch in the Tibeto-Burman language family. Southern Ngwi subgroups are Akoid, Bisoid and Mpioid (Bradley 1979:31). The Bisoid branch includes Bisu (referred to as Laomian and Laopin in China, Bisu in Thailand and Pyen in Myanmar), Sinsali (Phunoi), Sangkong, and Cong (Bradley 2002; 2007a; 2007b:289). The Pyen are located in Namt Theun and Yaw Tan villages, East Shan State, Mong Yang township, Myanmar, with a current population of around 615 (Bradley 2014:27). The coordinates for Mong Yang township are 21° 50' 40" N, 99° 40' 45" E, though the village coordinates are not available at this time. For the general Pyen area, see the map in Figure 1.

According to Bradley (2014:16, 26f), Pyin/Pyen and Laopin are different names for Bisu. The Pyen themselves confirm that they formerly called themselves Bisu. According to the community's oral tradition, they changed their name to Pyen in order to hide their identity from overlords (Person 2007:193f), though no historical evidence is found for this. Accordingly, the speakers recorded in this study referred to themselves as either Pyen or Bisu. Xu (1998) likewise refers to Laomian as the Lanmeng 澜勐 dialect of Bisu spoken in China. The exonym Laomian is also mentioned in Zhang's (2004) grammar sketch and Maung Maung Thun's (2014) sociolinguistic survey.

Since Pyen, Laopin/Laomian (Laopin in Menglian county, Laomian in Lancang county in China, cf. Bradley 2007b:289) and Bisu are varieties of the same language whose speakers have been out of touch over the past 150 years (Bradley 2014:27), it is not surprising that Pyen in Myanmar and Bisu in Thailand vary only slightly on the phonological level. Pyen lacks voiceless nasals, which are in the process of disappearing in Bisu in Thailand (Person 2007:194). In the Chinese Bisu/Pyen variety Laomian, voiceless nasals and laterals are still found in a few dialects, while voiced stop onsets are frequently prenasalized (Xu 1998). Non-

¹ Because the term "Lolo" was found to be pejorative (Bradley 2004:1), I have chosen to use Bradley's term "Ngwi" throughout this paper, though some of the literature referenced predates its use.

contrastive nasals are frequently added between words in Bisu in Thailand (Person 2000:37f). Laomian retains a four-way affricate distinction /ts ts^h tɛ tɛ^h/ (Xu 1998), which corresponds with Doi Chomphu Bisu /ts ts^h c tʃ^h/ (Person 2007:195). In Takaw Bisu (Bradley 1988:2) and Pyen (Person 2007:194), the affricates /ts, ts^h/ have merged with the palatal stops /c, c^h/. In addition, Laomian distinguishes a voiced sibilant /z/ and a voiced retroflex sibilant introduced through Chinese loan words (Xu 1998), which is not found in the inventories of Bisu and Pyen. While Pyen distinguishes a labiodental fricative /v/ (Person 2007:195f), Ban Lua Bisu has an approximant /w/ with a [v] allophone (Nishida 1973:62). Unlike Bisu and Pyen, Laomian does not have clusters with /l/ and /w/ (Xu 1998). Palatalized stops, analyzed by Xu as clusters in Laomian, are found in all three varieties. Bisu in Thailand and Pyen distinguish /i, e, æ/, as well as /u, o, ɔ/ (Person 2007:198), while the Bisu variety called Laomian in China does not distinguish mid and open front or back vowels (Xu 1998).

Figure 1: *Pyen region*



Pyen, Bisu and Laomian each have three contrastive high, mid, and low or low-falling tones (Person 2007:199; Xu 1998; Nishida 1973:57). Phonetic rising and falling tones are variations of level tones in Ban Lua Bisu (Nishida 1973:58) and Laomian (Xu 1998). Laomian has very few high level tones in syllables with stop codas, or syllables with velar nasal or palatalized bilabial onsets. The most frequent type of tone sandhi is a high level tone realized as a low tone. Thus, the high level tone occurs far less often in spoken Laomian (Xu 1998).

Tone sandhi is the most common form of morphophonemic alternation in Laomian (Xu 1998), found both in affixation and in connected speech. It is always the tone of the previous syllable which influences the tone of the following syllable, causing progressive assimilation. In compounds formed by content words, and in compound numerals, a low falling tone will cause a succeeding high level tone to become a low level tone (Xu 1998). In connected speech, the same tonal process occurs within compounded verbal predicates and among some adverbs or particles with high level tone when they are preceded by verbs or adjectives with low falling tone. A high level tone syllable will also change to a low level tone when following a numeral with low falling tone, as frequently happens with classifiers. Negative adverbs [ba³¹] ‘not’ and [a³¹] ‘do not’ lower the high level tones of succeeding verbs and adjectives to low level tones (Xu 1998). In Bisu, the low tone preverbal negation marker /bà/ normally lowers the tone of the following word, while a preceding low tone word or particle will lower the mid tone of the sentence-final particle /tʃĩ:/ (Person 2000:37). Ban Lua

Bisu has phonetic raising and lowering among adjacent main syllables, but displays the greatest tone variation in particles following verbs, especially the particle /ŋɛ/ (Nishida 1973:59).

A diversion from common tone patterns is the Laomian modal verb [ɛi⁵⁵] ‘want, be willing, like’. Although it follows the Laomian pattern of carrying a low level tone when preceded by a low falling tone verb, it retains its high level tone if it is preceded by a negated verb with low falling tone, as seen in the following example given by (Xu 1998).

[naŋ ³³	tsa ³¹	ɕi ^{55→22}	ba ³¹	tsa ³¹	ɕi ⁵⁵]
you	eat	willing, want	not	eat	willing, want
‘Do you want to eat it or not?’					

Research on grammatical tone and intonation is underdescribed in descriptive and typological linguistics (Palancar & Leonard 2016:1-6). Hyman (2016:15-35) demonstrates that tonal morphology is as efficient as segmental morphophonology. Inflectional tone, also referred to as ‘relational tone’ (Palancar & Leonard 2016:2), such as verb stem alternation in Chin (e.g. Lehman 1996, Hartmann 2002) or Khaling (Jacques 2016:42) has not been identified for Bisoid languages. This study provides a first description of Pyen tonal behavior, aiming to broaden the view on tonal processes in Southern Ngwi and adding further synchronic data to existing diachronic descriptions on Ngwi tonal development (Bradley 1979). After the methodology for this study is presented, an overview of the Pyen phoneme inventory will be given. Allophonic variation is discussed in §3; syllable and word structure is laid out in §4. The tone patterns of Pyen are investigated in §5, with specific discussion of tonal variation in suffixes in §5.1 and tone sandhi in §5.2. §6 describes the behavior of an intonational phrase-final boundary tone, before the research findings are summarized in §7.

1.1 Methodology

The analysis of Pyen presented in this paper is based on data from three male speakers living in Myanmar, Speaker A from Yaw Tan village and Speakers B and C from Namt Theun village. The data were collected in Thailand during September and November 2014, and January 2015. Oral consent was obtained after the researcher read a consent request regarding recording, analysis and publication of their speech samples off a paper, which was verbally translated to them. Speech Analyzer² and Dekereke³ were used to process the data. The data were elicited using Shan, Burmese, and Lahu, depending on the individual speaker’s L2 skills. Digital recordings were made of an 800-item wordlist using three repetitions and one whistle of each item. These data are available via the Zenodo repository⁴. The speakers were asked to whistle each item for the purpose of extracting the tone. After the first few shy attempts, the speakers were able to whistle all items. The whistling did prove effective for extracting the three high(-level), mid(-level), and low(-falling) tones. However, when using Lahu orthography to write down and read words and phrases, the speakers whistled the tone indicated by the Lahu tone marks, rather than the actual pitch of the words and phrases they had spoken.

Following this same method of three repetitions and one whistle, further recordings were made of suspect minimal pairs/triplets in different grammatical forms and carrier phrases. Nouns were recorded in isolation, in the possessive, singular and plural forms (examples (1-4)). In the data available for this study, high pitch is transcribed here using an acute accent, mid pitch a level accent, low pitch a grave accent and falling pitch a circumflex accent.

² Acoustic analysis program developed by JAARS (SIL International affiliate): <http://software.sil.org/speech-analyzer/>.

³ Phonology data management program developed by Rod Casali. <http://casali.canil.ca/>.

⁴ The audio files are available at the following links.
<https://zenodo.org/record/1745055#.XEPOYVxKjIU> (Sample audio data)
<https://zenodo.org/record/2538885#.XEO0mFxKjIU> (Tone frames comprising 1,800 recordings)
<https://zenodo.org/record/2538408#.XEPNwVxKjIU> (758 words collected from Speaker C)
<https://zenodo.org/record/1745317#.XEPN1xKjIU> (261 words collected from Speaker B)
<https://zenodo.org/record/1745296#.XFPHmlxKjIU> (850 words collected from Speaker A, Part I: 1-350)

- (1) /āŋ-pú/ ‘grandfather’
 (2) /āŋ-pú maŋ bē āŋ-pú/ ‘grandfather’s grandfather’
 (3) /āŋ-pú t^hī hù/ ‘one grandfather’
 (4) /āŋ-pú āŋ-bià/ ‘many grandfathers’

Adjectives were recorded in isolation and in the negative form, as shown in (5)-(8). The lowering effect of the negative prefix /bà/ is discussed in 5.2.

- (5) /āŋ-jà/ ‘true’
 (6) /bà-jà/ ‘not true’
 (7) /āŋ-mōŋ/ ‘high’
 (8) /bà-mōŋ/ ‘not high’

Verbs were recorded, in minimal pairs and triplets if possible, with the negative prefix and with the past, imperfective, future, imperative suffixes. The following examples present a minimal tone set, with the word stem in bold letters in the first negated examples.

Low Tone:

/bà-**c^hù**/ ‘not suckle’; /c^hù-biá/ ‘suckled’; /c^hù-ne/ ‘suckle’; /c^hù-ná/ ‘will suckle’; /c^hù-báw/ ‘Suckle!’

Mid Tone:

/bà-**c^hū**/ ‘not hold’; /c^hū-biá/ ‘held’; /c^hū-ne/ ‘hold’; /c^hū-ná/ ‘will hold’; /c^hū-báw/ ‘Hold!’

High Tone:

/bà-**c^hú**/ ‘not boil’; /c^hú-biá/ ‘boiled’; /c^hú-ne/ ‘boil’; /c^hú-ná/ ‘will boil’; /c^hú-báw/ ‘Boil!’

Verbs were later recorded with other affixes in order to investigate any further possible tonal variation. These affixes are /-ji/ for cited forms, continuous aspect forms /-lè-/ and /-là-lè-, a ‘place-which’ form /-kia/, the prohibitive form /à-.jó³/, imperfective aspect marker /-jāw-wá/, /-sīŋ-nē/ ‘in case’, and /-báw/ ‘at that time’. Finally, verbs were recorded with two yes/no question forms and the affirmative answer form, shown in examples (9)-(11) below.

- (9) /kò-já/ smack-PER ‘(you) smack’
 (10) /kò-já-là/ smack-PER-Q ‘Did (you) smack?’
 (11) /kò-biá/ smack-PAST ‘Yes, (I) smacked’.

Sentence frames were then used to record nouns and verbs in different tone environments. The sentence order is SOV, so a noun in subject position ending on one particular tone would be followed by nouns in object position with all three possible tones (seen in example (10)), and vice versa. The same was done for objects and verbs.

- (12) /āŋ-**pú** āŋ-tú c^hī-ne/ ‘Grandfather lifts a twig.’
 /āŋ-**hān** āŋ-tú c^hī-ne/ ‘Grandchild lifts a twig.’
 /á-**p^hī** āŋ-tú c^hī-ne/ ‘Grandmother lifts a twig.’

2 Pyen phoneme inventory

The consonant inventory is comprised of oral and nasal stops at the labial, alveolar, palatal and velar places of articulation, three fricatives, and four approximants. Stops have a three-way distinction: voiced, voiceless, and voiceless aspirated. Bilabial oral stops, the voiceless aspirated alveolar stop, the voiceless velar stops, and the bilabial nasal also occur palatalized. The consonant inventory is shown in Table 1. Parentheses indicate phonemes in loan words and onomatopoeic expressions.

The phonemes /f, r/ only occur in a very limited number of Shan and Burmese loan words. /r/ occurs as a phoneme in the word /k^hrīt/ ‘Christ’, but is an allophone of /l/ in all other recorded items. /f/ occurs in a handful of words such as /càw.fà/ ‘Lord’; /fīk.kò/ ‘mat’; /fák/ ‘put something in the care of’; and /fīn/

‘opium’. /f/ occurs in the onomatopoeic word /fū.fū/ ‘fast’, while /tʰ/ occurs in the onomatopoeic expression /tʰù.tʰù/ for the sound of rushing water.

Palatal stops occur with a fricative release. In cognate words, Person (2007:195) posits that the Pyen palatal stop /c/ corresponds to Doi Chomphu Bisu /ts/, and that the Pyen affricate /tʰ/ corresponds to Doi Chomphu Bisu /tsʰ/. This differs from my analysis of an aspirated palatal stop /cʰ/ and Bradley’s (1988:2) observation that the Takaw variety of Bisu merged /ts/ with /c/, and /tsʰ/ with /cʰ/. Person’s (2007) Bisu /hl/ corresponds to Pyen /ç/ in my analysis.

Table 1: *Pyen consonants.*

	Bilabial	Labio-dental	Alveolar	Palatal	Post-palatal
Voiceless oral stops	p pʲ		t	c	k kʲ
Voiceless aspirated oral stops	pʰ pʰʲ		tʰ (tʰʲ)	cʰ	kʰ kʰʲ
Voiced oral stops	b bʲ		d	ɟ	g
Nasal stops	m mʲ		n	ɲ	ŋ
Fricatives		(f) (fʲ)	s	ç	h
Approximants	w		l (r)	j	

In addition to the voiced velar stop /g/, Pyen has a well-attested voiced palatal stop /j/, as seen in the affix /-ji/ following cited forms in isolation. The voiced palatal stop /j/ also occurs in several personal names, e.g. /á.jè/, /án.jà/ or /àn.jà.lé/, and in at least three clause-final verb affixes /ji/ ‘CIT’, /jó/ ‘PROH’, and /já/, as in /bó...já/ ‘EXCLAM...STEM’ or /cá...já/ ‘COHORT...STEM’. The voiced palatal stop is also found in Phunoi (Bradley 1977a:69, 71), but not in Bisu. Both /g/ and /j/ are rare, but contrastive. The voiced velar stop /g/ occurs in at least two high-frequency function words /gā/ 1SG; /gū/ 2SG and in the content word /gā/ ‘look up’.

The vowel inventory includes three front vowels /i e ε/, three central vowels /i ə a/, and three back vowels /u o ɔ/. Person’s (2007:198) vowel inventory is identical to the one in this study, with the exception of /æ/, which I hear as /ε/, and diphthongs, which I analyze as vowel-glide sequences. The vowel inventory is shown in Table 2.

Table 2: *Pyen vowels.*

	Front	Central	Back
Close	i	ɨ	u
Mid	e	ə	o
Open	ε	a	ɔ

3 Allophonic variation

In Bisu, words are frequently linked with non-contrastive nasals (Person 2000:37f). Similarly, Pyen demonstrates free variation of nasal codas, such as /cʰū-ná/ ‘hold-FUT’ [cʰūŋ.nâ] ~ [cʰū.nâ], /cʰú-báw/ ‘boil-if’ [cʰúŋ.bâw] ~ [cʰú.bâw], /cà-já/ ‘eat-STEM’ [càn.jâ] ~ [cà.jâ], and /kó-biá/ ‘level.off-PAST’ [kóŋ.biâ] ~ [kó.biâ]. However, there are also contrastive nasal codas, as in /kʰá-ne/ ‘spill’ and /kʰán-ne/ ‘buffer’.

Like the [w] ~ [v] allophones observed in Ban Lua Bisu (Nishida 1973:62), /w/ is most frequently realized as the labiodental approximant [v] in Pyen. Bilabial rounded [w] is limited to before the low central vowel [a]. Delabialized [v] occurs most often in onset position, especially before front vowels, as in /āŋ-wíŋ/ [āŋ.víŋ] ‘dark’, /wē.jà.sōn/ [vē.jà.sōn] ‘garden’, /āŋ-wèw/ [āŋ.vèw] ‘peeling’, /mé.kà.wō.pʰəŋ.lè.ne.í/ [mé.kà.vō.pʰəŋ.lè.nè.í] ‘mask’, and /wáj-ne/ [wáj.né] ‘be.tilted-IMPV’. The /w/ in the Lahu loan /wà/

[wà]~[và] ‘pig’ shows the same allophonic variation as the /w/ in the Pyen word /āŋ.wà/ [āŋ.wà]~[āŋ.và] ‘do’. Likewise, the palatal approximant /j/ is often realized with some frication or as a voiced post-alveolar fricative [ʒ] when preceding close and close-mid front vowels /i e/, as in /jì-ne/ [ʒì.nè] ‘scold-IMPV’.

The lateral approximant /l/ occurs in onset position and syllable-medial position. In stop-initial clusters, it alternates in free variation with a flap or alveolar approximant, or frequently is dropped altogether. Speaker B pronounced /plāk-ne/ ‘jump-IMPV’ with all three of these variants, [plāk.né], [prāk.né] and [pāk.né]. In at least two instances, /l/ occurs palatalized before front vowel /e/, as in [āŋ.lèw] /āŋ-lèw/ ‘sharp point’.

The sibilant /s/ has either aspirated or palatalized variants [sʰ] and [sʲ] preceding the close front vowel /i/, and in a few instances also /e/. There are no recorded instances of a sibilant with both palatalization and aspiration. One instance of an aspirated sibilant before /u/ occurred in a Shan loan word. Unaspirated [s] may also occur before /i/ but is less common in this environment. This allophonic variation of the sibilant occurs with all of the speakers. Examples are /cʰáŋ.sí/ realized as [cʰáŋ.sʰí]~[cʰáŋ.sʲí] ‘funeral’; /jà.sí-ne/ realized as [jà.sʰí.né] ~ [jà.sʲí.né] ‘want’; /sé-ji/ realized as [sén.jí] ~ [sʰéŋ.jí] ‘curse’; /sé.lé.jú-ne/ realized as [sʰé.lé.jú.né] ~ [sʲé.lé.jú.né] ~ [sé.lé.jú.lè.nè] ‘be proud’.

The voiceless glottal fricative /h/ has three fricative allophones [h, ɸ, ç]. It is usually realized as a voiceless bilabial fricative [ɸ] before close central and back vowels /i, u/, as shown in examples (13) - (15), and as a voiceless palatal fricative /ç/ before close front vowel /i/, seen in example (16). In more careful pronunciation, [h] and [ɸ] also may occur in free variation before the same vowels with low tone, as in (17) and (18), or be consistently realized as [h], as in (19). Before mid and open vowels, the pronunciation of /h/ does not vary; it is always realized as glottal fricative [h]. Capitals in parentheses refer to the speakers.

(13)	/āŋ-hín/	[āŋ.ɸín]	‘faint’
(14)	/pí.hù-ne/	[pí.ɸù.né]	‘show’
(15)	/tì.hù/	[tì.ɸù]	‘be alone’
(16)	/má.hì/	[má.çì] (A), [má.hì] (C)	‘malaria’
(17)	/āŋ-hù/	[āŋ.hù] (A), [āŋ.ɸù] (C)	‘price’
(18)	/hìn-ne/	[hìn.nè] (B, C), [ɸìn.nè] (A)	‘run’
(19)	/āŋ-hì/	[āŋ.hì] (B, C)	‘elder’

The open back vowel /ɔ/ is sometimes pronounced [o] by Speaker A, who is from Yaw Tan village and is a generation older than Speakers B and C from Namt Theun village, confirming Bradley’s (1988:2) note that e ~ε and o ~ɔ do not seem to be originally contrastive in Bisu. In addition, the voiced bilabial stop is frequently lenited to [β] by Speaker A. I also found that Speaker C still occasionally uses voiceless nasals, deemed lost by Person (2007), where Speaker B uses voiced nasals, even though they were both under age 30 and lived in the same village at the time of recording.

4 Syllable and word structure

Word stems have the syllable shape (C₁)(C₂)V(C₃)/ T. All consonants occur in onset position. The glottal stop [ʔ] is not found as an onset. It only occurs between vowels of the same quality as a morpheme break to distinguish vowel-initial syllables from the vowel kernel of the preceding syllable, as in /bà.à/ [bà.ʔà] ‘no’. The only instance of a word-initial glottal is found in the Shan loan word /ə.ə.ə/ [ʔə.ʔə.ʔə] ‘to hiccough’. Codas comprise the oral and nasal stops /p t k m n ŋ/ and the approximants /w j/.

In addition to the clusters /bl, kl, kʰl, kw/ described for Pyen by Person (2007:196f), the clusters /pl, pʰl, tl, dl, kʰw/ have been identified in the present study, possibly due to the bigger corpus. All bilabial and velar stops can be followed by /l/, except for the voiced velar stop, which has limited occurrence. There may be some variation regarding cluster simplification, as /āŋ-kʰlón/ ‘hole’ is recorded by Speaker A as [āŋ.kʰlón] ~ [āŋ.kʰón] and by Speaker B as [āŋ.kʰón]. The unaspirated alveolar stops /t/ and /d/ can also form clusters with /l/. The cluster /dl/ is rare in Pyen, as is /tl/; in the corpus available for this study they occur only in the lexemes in /nìŋ pān tī/ [nìŋpāntī] ‘goiter’, /dlú-ne/ [drúné] ‘powdered’ and /tʰè dlú/ [tʰèdrú] ‘(It’s) crushed!’. However, Baron (1988:1) identifies /dl/ clusters in Sani, a Central Ngwi language, as regularly reflecting Proto-Ngwi initial *labial/glide clusters such as *pr-, *py- and *pl-. (Note that Bradley’s 1979 study does not include this variety). All bilabial and voiceless velar and aspirated alveolar stops can be followed by /j/. The only non-plosive forming a cluster is the nasal /m/ followed by /j/. Because nasal stops appear to pattern like oral stops in the context of the palatal approximants in medial position, consonant clusters formed with /j/ are

tentatively interpreted here as palatalized oral or nasal stops. Voiceless unaspirated and aspirated velars additionally can form clusters with /w/.

The syllable structure of affixes is limited to single onsets and open or sonorant-final syllables ending on /w j m n ŋ/. The majority of monosyllabic nouns, adjectives, and verb stems, including loan words, must take the semantically empty mid-tone prefix /āŋ-/ to create phonotactically preferred two-syllable words when they do not take any other affixes or stems. Only a limited number of frequently occurring open or sonorant-final syllables forming nouns can occur without an affix, e.g the three common loan words /wà/ ‘pig’ (Lahu loan), /k^hō/ ‘hoe’ and /nà/ ‘paddy rice field’ (both Shan loans).

When a stem is reduplicated or preceded by a numeral, the prefix /āŋ-/ is dropped, as in /āŋ-kām/ ‘slow’ vs. /kām kām/ ‘slowly’, or /āŋ-kām/ ‘measure of rice’ vs. NUM-/kām/ ‘X measures of rice’. In compounds, the affix of the second stem is dropped, as in /āŋ-tō/ ‘body’, /āŋ-jāw/ ‘bone’, /āŋ-tō.jāw/ ‘skeleton’.

Verb stems can have up to three suffixes, as in /c^hú-là-lè-ne/ boil-CONT2-CONT1-IMPV ‘boiling’. Morphemes are monosyllabic, with the shortest consisting of a vowel, as in /ù/ ‘swelling’, and the longest syllable consisting of a cluster and a coda, as in /plōk/ ‘break’. Compounding is a common method of word formation; for example, /āŋ-tō/ ‘body’ and /āŋ-jāw/ ‘bone’ join to form /āŋ-tō.jāw/ ‘skeleton’. Compound words usually range from two to four syllables. The most frequent word structure is disyllabic, combining a stem with a prefix or a suffix. Noun, verb, and adjective stems can be either open or closed syllables. Table 4 shows the syllable structures found in monosyllabic and disyllabic words.

Table 3: Syllable structure for mono- and disyllabic words.

Syllable structure	Phonemic transcription	Gloss
V	/ù/	swelling
VC	/āŋ-/	prefix
CV	/kō/	seed
CVC	/c ^h áŋ/	person
VC.CCV	/āŋ-kwè/	crooked
CCV.CV	/klā-ne/ ⁵	drop
VC.CCVC	/āŋ-k ^h lōŋ/	hole
CCVC.CV	/k ^h lōk-ne/	break

Pyen is an agglutinating language, where grammatical morphemes are affixed to express verb inflection and derivation. As these morphemes are bound, attached to verb and adjective stems and other affixes, they are analyzed as affixes rather than clitics (cf. Zwicky and Pullum, 1983:503f).

5 Tone patterns

Southern Ngwi languages tend to retain the Proto-Ngwi high, mid, and low tones for vowel- and nasal-final syllables, and mid and low tones for stop-final syllables (Bradley 1977b:8). Pyen does not deviate from that pattern, seen in the minimal tonal set /c^hə/ ‘dig’ vs. /c^hē/ ‘pick flowers’ vs. /c^há/ ‘sing’. Stop-final syllables are the least common syllable form in the data. The low tone has slightly falling pitch. Verb stems and nouns carry all three tones. The subject marker and some other suffixes such as /-ji/ ‘cited form’, /-ne/ ‘imperfective’, and /-kja/ ‘place.where’ are tonally unspecified in that their pitch is determined by the tone of the preceding syllable, seen in the examples /c^hù-ne/ [c^hùnè] ‘suckle’ vs. /c^hú-ne/ [c^húné] ‘boil’. As noted earlier, the majority of nouns and unsuffixed verb stems must take the prefix /āŋ-/ in the absence of other affixes or stems. The /āŋ-/ prefix has a mid tone, creating the patterns MH, MM, ML for many words. Minimal sets for tones sorted by syllable structure are given in Table 5.

⁵ There are no examples with unambiguous CC sequences in monosyllabic words in the data corpus, perhaps because monosyllabic words have only limited occurrence in Pyen.

Toneless syllables are characteristic of African tone typology, but found in Asia, too (Hyman 2007:10; Evans 2008:464). Pyen also has ‘African’ characteristics, such as toneless affixes, not unlike the Pumi clitics discussed by Jacques (2011:7), which take their tone specification from the verb stem. Whereas Pumi verb stems spread their tone onto a following clitic, Pyen verb stems merely specify the tone of certain suffixes. For example, the mid tone on the stem /c^hũ/ ‘hold’ triggers a high tone on any unspecified suffix, e.g. imperfective marker /-ne/, leading to the form [c^hũné]. The stem is not underlyingly MH, as can be seen in /bà-c^hũ/ ‘NEG-hold’. Unspecified tones will be discussed in section 5.1. The limitation of stop-final syllables in Pyen to mid and low(-falling) tones, is a like typical ‘Asian’ feature that restricts tones by syllable type (Hyman 2007:17). Tone sandhi is present in Pyen, basically following the patterns laid out by Xu (1998) for Laomian. Examples are provided in section 5.2.

Table 5: *Pyen syllable structures and minimal tonal sets*

σ	Low Tone	English gloss	Mid Tone	English gloss	High Tone	English gloss	
CV	c ^h ə-ne	dig-IMPV	c ^h ə-ne	pick.flowers-IMPV	c ^h ə-ne	sing-IMPV	
	c ^h ò-ne	be.cold-IMPV	c ^h ò-ne	build-IMPV			
	c ^h ù-ne	suckle-IMPV	c ^h ù-ne	hold-IMPV	c ^h ù-ne	boil-IMPV	
	k ^h à-ne	pout-IMPV	k ^h à-ne	plant-IMPV	k ^h à-ne	spill-IMPV	
	kò-ne	smack(chewing)-IMPV	kò-ne	pick.up-IMPV	kó-ne	be.full-IMPV, stack-IMPV	
	mà-ne	point-IMPV			má-ne	be.bearing.fruit-IMPV	
	sà-ne	be.easy-IMPV			sá-ne	search.for-IMPV-NE	
	sì-ne	call-IMPV	sī-ne	spin.thread-IMPV			
	là-ne	go.take-IMPV			lá-ne	come-IMPV	
	jà-ne	weave-IMPV			já-ne	winnow-IMPV	
	jù-ne	sleep-IMPV			jú-ne	take.smthng-IMPV	
	āŋ-çà	itch (V)	çā	chicken	çá	mountain rice field	
	āŋ-pà	on.duty	āŋ-pā	behind			
	pà	bee	āŋ-p ^h ā	scatter.by.hand	āŋ-p ^h á	rib	
	āŋ-p ^h à	leaf	āŋ-p ^h ā	smashed			
	āŋ-tì	beat (V)(hit a person)			āŋ-tí	frayed.apart	
	āŋ-tù	head			āŋ-tú	twig	
	āŋ-dà	early			āŋ-dá	painful	
	āŋ-càn	slip (V)			āŋ-cán	extra	
	āŋ-cò	lit			āŋ-có	narrow	
	āŋ-c ^h à	dirty			āŋ-c ^h á	liquid	
	āŋ-ki	struggle (V)			āŋ-kí	busy	
			āŋ-kī	wide	āŋ-kí	dry	
	āŋ-kò	loose	kò	seed	āŋ-kó	enough	
	āŋ-k ^h i	can, able	āŋ-k ^h ī	scrub (V).cò			
	āŋ-k ^h ò	tall	āŋ-k ^h ò	skin			
	āŋ-nè	rope			āŋ-né	red	
	āŋ-nà	deep			āŋ-ná	obedient	
	āŋ-sà	poor, meat	āŋ-sā	allergic.reaction	āŋ-sá	search.for (V)	
	āŋ-sì	new			āŋ-sí	yellow	
	CCV	kwà-ne	observe-IMPV			kwá-ne	be.wide-IMPV
				klā-ne	drop-IMPV	dlú-ne	be.powdered-IMPV
	CVG	pòj-ne	celebrate-IMPV			pój-ne	drop-IMPV
wàj-ne		be.first-IMPV			wáj-ne	be.tilted-IMPV	
āŋ-càj		use (V)	āŋ-cāj	spend.money (V)			
āŋ-k ^h àw		empty			āŋ-k ^h áw	inside	

	āŋ-wàj	first			āŋ-wáj	tilted	
CVN	p ^h ōŋ- ne	be.pressured-IMPV	p ^h ōŋ- ne	open-IMPV	p ^h ōŋ- ne	level.off-IMPV	
	c ^h āŋ- ne	jump.up.and.down- PRES	c ^h āŋ- ne	be.figuring.out.path- IMPV			
	k ^h ān- ne	punish-IMPV			k ^h án- ne	buffer-IMPV	
	hàn-ne	be.heavy-IMPV			hán-ne	bring.smthng-IMPV	
	lùŋ-ne	flow-IMPV	lūŋ-ne	mix-IMPV			
	k ^h òŋ	village	hāŋ	rice	lāŋ	water	
	āŋ- kām	slow	āŋ- kām	measure of rice			
	āŋ- k ^h òŋ	press, dimple (V)			āŋ- k ^h óŋ	hole	
	CVS	pèk-ne	stand.against-IMPV	pēk-ne	throw.out-IMPV		
	CCVS			plāk- ne	jump-IMPV		
			k ^h lāk- ne	break-IMPV			

Pyen has an intonational-phrase final boundary tone, HL%, used to indicate grammatical mood, while ‘Asian’ typologies limit tone to lexical purposes. An example for this boundary tone is /cá āŋ-pú maŋ cà-já/ [cā āŋpú máŋ càŋjā] COHORT grandfather DEM eat-STEM ‘Grandfather, let’s eat!’ A discussion of boundary tones is provided in section 6.

5.1 Tonal variation in suffixes

Suffixes are restricted to either high or low tone. At least three verb suffixes, i.e. the imperfective marker /-ne/, the cited form /-ji/, and the locative ‘place.where’ marker /-kia/, can occur with both high or low tone since their realization depends on the tone of the preceding verb stem, or on other preceding suffixes added to the stem. Preceding high and mid tone stems or suffixes cause a high tone, and preceding low tone stems or suffixes cause a low tone on any of these three suffixes, e.g. [c^hú.kíá] ‘place to boil’, [c^hū.kíá] ‘place to hold’, and [c^hù.kíà] ‘place to suckle’, or the isolated forms [cā.jí] ‘have’, [cà.jí] ‘eat’, [tā.jí] ‘cut’, and [tə.jí] ‘swollen’. The tone of the other verb suffixes is stable and never changes in any environment. An example of this kind of tone assimilation in suffixes is seen in (20-22) with the syllable /c^hu-/ for which all three tones are contrastive. In (20), the low tone of the verb stem /c^hù-/ ‘suckle’ causes a low tone on the suffix /-ne/, while the low tone on the suffix /-lè/ in (21) and (22) remains unchanged. The imperfective suffix /-ne/ has a high tone caused by the mid-tone verb ‘hold’, shown in [c^hū.né] in (21). The addition of the continuous aspect suffix /-lè/ to the verb stem causes the same suffix to carry a low tone, as in (21) [c^hū.lè.nè] ‘holding’. Adding a further suffix /-là/ before the suffix /-lè/ does not change the tone on /-lè/ or the low tone realized on /-ne/, as seen in (21) [c^hū.là.lè.nè]. Examples in (22) illustrate the same pattern for the high tone.

- | | | | |
|------|-----------------------------|-----------------------------|---------------|
| (20) | /c ^h ù-ne/ | [c ^h ù.nè] | ‘suckle’ |
| | /c ^h ù-lè-ne/ | [c ^h ù.lè.nè] | ‘be suckling’ |
| | /c ^h ù-là-lè-ne/ | [c ^h ù.là.lè.nè] | ‘be suckling’ |
| (21) | /c ^h ū-ne/ | [c ^h ū.né] | ‘hold’ |
| | /c ^h ū-lè-ne/ | [c ^h ū.lè.nè] | ‘be holding’ |
| | /c ^h ū-là-lè-ne/ | [c ^h ū.là.lè.nè] | ‘be holding’ |
| (22) | /c ^h ú-ne/ | [c ^h ú.né] | ‘boil’ |
| | /c ^h ú-lè-ne/ | [c ^h ú.lè.nè] | ‘be boiling’ |
| | /c ^h ú-là-lè-ne/ | [c ^h ú.là.lè.nè] | ‘be boiling’ |

5.2 Tone sandhi

Like described for the Bisu variety Laomian (Xu 1998), Pyen displays progressive tonal assimilation, as in /bà-c^hú/ [bàc^hù] ‘NEG-boil’. Person (2000:37) also mentions this assimilation in Bisu in Thailand. From the Pyen data, the low tone of this prefix lowers the high tone of a following stem either to a mid tone or to a low tone, for example /bà-p^hóŋ/ [βàp^hóŋ] ‘NEG-level.off’, /bà-c^há/ [βàc^hà] ‘NEG-sing’, and /bà-c^hén/ [bàc^hèn] ‘NEG-sour’. However, the negative prefix only slightly lowers a following mid tone, if at all, for example /bà-p^hóŋ/ [βàp^hóŋ] ‘NEG-open’ and /bàc^hā/ [βàc^hā] ‘NEG-pick (flowers)’.

Low and mid verb stems are often realized with rising pitch before a suffix with high tone, which is also attested in Bisu (Nishida 1973:58). A high tone verb suffix preceded by a low or mid tone stem is often realized with falling pitch, for example /c^hù-ná/ [c^hùŋ-nâ] ‘suckle-FUT’ and /c^hū-ná/ [c^hūŋ-nâ] ‘hold-FUT’, but /c^hú-ná/ [c^húŋ-nâ] ‘boil-FUT’.

6 Intonation

The reinterpretation of intonation as a tonal feature is very common among level tone systems (Michaud 2008:13). Michaud lists intonational marking for boundaries/junctures, information structure, and the expression of attitude and emotions, and observes that f0 and intensity are higher in emphatic expressions for any lexical tone in Naxi. Furthermore, tone can also carry phrasal-level functions, in which case Michaud and Vaissière (2015:59) call it intonational tone. A third intonational phenomenon observed by the same authors is intonational tone conveying prominence (p. 59).

For Pyen, a low intonational-phrase final boundary tone, L%, has been identified. This is seen in the falling contour of the high-tone future stem /-ná/ in the example /c^hù-ná/ [c^hùŋnâ] ‘suckle-FUT’. However, Pyen also has a second, high-falling intonational-phrase final boundary tone, HL%, comparable to Michaud’s f0 heightening for boundary tones in Naxi (2008:16). This Pyen boundary tone most frequently expresses exclamation or emphasis, is associated with a greater excursion of f0 than L%, and is often found in conjunction with phrasal affixes indicating grammatical mood. HL% is solely dependent on whether the expression is exclamative or neutral, acting independently of lexical tone as seen in the following examples. For example, the stem /plāk/ ‘jump’ is realized with mid tone in /plāk-ne/ [prākne] ‘(It) jumps’, but with a high-falling pitch in an exclamation like /t^hè plāk/ [t^hèprāk] ‘(It) jumped (out/away)!’. Another example is /dlú-ne/ [drúnè] ‘(It’s) powdered’ vs. /t^hè dlú/ [t^hèdrú] ‘(It’s) crushed!’ as an exclamation when something is crushed in a disaster. The high fall in the exclamation is more pronounced than a lexical high tone, with or without L%, in neutral environment. For less emphatic or neutral expressions created with /t^hè/, HL% is not used, as in /t^hè k^há/ [t^hè k^há] ‘It spilled!’, /t^hè sí/ [t^hè sí] ‘to add yellow color to food’, or /āŋ-sí/ [āŋ.sí] ‘yellow’.

Boundary tones are found in positive exclamation or emphasis (examples 23-29), negative exclamation or emphasis (30-32), and negative emphatic expressions (33-35).

Positive exclamation or emphasis⁶:

(23)	/cá āŋ-pú maŋ cà-já/ COHORT grandfather DEM eat-STEM	[cá āpú máŋ càjâ] ‘Grandfather, let’s eat!’
(24)	/bó āŋ-pú maŋ cà-já/ EXCLAM grandfather DEM eat-STEM	[bô āŋpú máŋ càŋjâ] ‘Great, grandfather eats!’
(25)	/t ^h áw ā-pú má/ AFF.Q grandfather STEM	[t ^h áw āpú mâ] ‘Yes, grandfather?’
(26)	/ná ā-pú maŋ/ DEM.EMPH grandfather DEM	[nâ āpú máŋ] ‘Exactly this grandfather’
(27)	/nó ā-pú maŋ/ DEM.EMPH grandfather DEM	[nô āpú máŋ] ‘Here, grandfather!’
(28)	/nâw ā-pú maŋ/ heed.IMP grandfather DEM	[nâw āpú máŋ] ‘Listen well, grandfather!’

⁶ Note that there is no grammatical description for Pyen available. The glosses are the author’s best guesses and not deemed reliable.

- (29) /tʰó ā-pú maŋ/ ADM grandfather DEM [tʰó āpú máŋ] ‘Watch out, grandfather!’

Examples of negative exclamation or emphasis:

- (30) /já ā-pú maŋ/ NEG.DEM.EMPH grandfather DEM [já āpú máŋ] ‘Not exactly this grandfather’

- (31) /à cà-ǰó/ PROH eat-STEM [à.cà.ǰô] ‘Don’t eat!’

- (32) /à cā-ǰó/ PROH have-STEM [à.cā.ǰô] ‘Don’t have (it)!’

Examples of negative emphatic expressions created with /tʰè:

- (33) /tʰè cá/ [tʰě cá] ‘I told you so!’
 (34) /tʰè krá/ [tʰě krâ]~[tʰě kâ] ‘Look at this (e.g. mess)!’
 (35) /tʰè cʰó/ [tʰě cʰô] ‘See!’ (I warned you/told you so!)

7 Summary

Pyen has three contrastive tones, high, mid, and low, with stop-final syllables taking only mid and low tones. The low tone has falling pitch, the other tones are fairly level. Verb stems and nouns carry all three tones; the majority of these must take the mid-tone prefix /āŋ-/ to create phonotactically preferred two-syllable words when they do not take any other affixes or stems. Suffixes have either high or low tone, but for at least three verb suffixes the tone is unspecified. These are the markers /-ne/ ‘imperfective’, /-ǰi/ ‘cited form’, and /-kia/ ‘place.where’, occurring with both high or low tone since their realization depends on the tone of the preceding verb stem or suffix. These three suffixes consistently take a high tone when preceded by a high or mid tone, and a low tone when preceded by a low tone.

Regarding tone sandhi, the negative prefix /bà-/ lowers the high tone of a following stem to a mid or low tone, but only slightly lowers a following mid tone. Low and mid verb stems are often realized with rising pitch before a suffix with high tone.

In addition to a low regular or neutral intonational-phrase final boundary tone L%, Pyen uses a high-falling intonational-phrase final boundary tone, HL%, to mark emotion. HL% most frequently expresses exclamation or emphasis, is associated with a greater excursion of the fundamental frequency than L%, and is often found in conjunction with phrasal affixes indicating grammatical mood. Future research is needed on the tone of prepositions, conjunctions, and object markers.

Abbreviations

ADM	admonitive
AFF.Q	affirmative question
COHORT	cohortative
CONT1	continuous aspect, form 1
CONT2	continuous aspect, form 2
DEM	demonstrative
DEM.EMPH	demonstrative emphatic
EXCLAM	exclamative
IMP	imperative
IMPV	imperfective
NEG	negative
NEG.DEM.EMPH	negative demonstrative emphatic (used with humans)
NUM	numeral
PER	perfective
POSS	possessive

PROH	prohibitive
Q1	yes/no question marker, form 1
Q2	yes/no question marker, form 2

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Reviewed: Received 29 March 2017, revised text accepted 30 November 2018, published 22 February 2019

Editors: Editor-In-Chief Dr Mark Alves | Managing Eds. Dr Paul Sidwell, Dr Nathan Hill, Dr Sigrid Lew