

PRESTOPPED BILABIAL TRILLS IN SANGTAM*

Alexander R. Coupe

Nanyang Technological University, Singapore
arcoupe@ntu.edu.sg

ABSTRACT

This paper discusses the phonetic and phonological features of a typologically rare prestopped bilabial trill and some associated evolving sound changes in the phonology of Sangtam, a Tibeto-Burman language of central Nagaland, north-east India. Prestopped bilabial trills were encountered in two dozen words of a 500-item corpus and found to be in phonemic contrast with all other members of the plosive series. Evidence from static palatograms and linguagrams demonstrates that Sangtam speakers articulate this sound by first making an apical- or laminal-dental oral occlusion, which is then explosively released into a bilabial trill involving up to three oscillations of the lips.

The paper concludes with a discussion of the possible historical sources of prestopped bilabial trills in this language, taking into account phonological reconstructions and cross-linguistic comparisons.

Keywords: Tibeto-Burman, Sangtam, phonology, static palatography, field linguistics, linguistic typology

1. INTRODUCTION

Research on under-studied minority languages can potentially provide new insights into the extent of phonological diversity to be found in the world's languages. One good example of this is a typologically intriguing and extremely rare segmental phoneme encountered during fieldwork on the northern dialect of Sangtam [ISO 639-3 code: *nsa*], a virtually undocumented Tibeto-Burman language spoken in the Tuensang District of central east Nagaland, north-east India.

The consonant phoneme of interest is most accurately described as a prestopped bilabial trill. This unusual sound has only previously been reported in Oro Win and Wari', two Chapakuran languages of Brazil [1, 2]. MacEachern et al. [2] describe it as 'a voiceless dental plosive which is released in such a way as to form a labial trill', a depiction that closely characterises the articulation of the prestopped bilabial trill of Sangtam.

The first and only other report on this sound in the Sangtam language was by the German ethnologist Kauffman [3], who briefly described its

manner of articulation in an ethnographic description published in 1939:

pw = der für Nord-Sangtam typische Konsonant, sehr schwierig auszusprechen; tönt etwa wie *pw* oder *pr*. Wird jedoch von den Lippen gebildet, durch die man die Luft so preßt, daß die Untelippe einmal (oder zweimal) vibriert. (Möglicherweise gibt es den gleichen Konsonanten etwas weicher und wird dann mit *bw* bezeichnet).

Translation: *pw* = the typical consonant for the North Sangtam language, very difficult to pronounce; sounds like *pw* or *pr*. It is however produced by the lips, through which one presses the air in a way that the lower lip vibrates once (or twice). (Possibly, the same consonant exists in a slightly softer form and is then termed *bw*).¹

In 2012 a similar sound was encountered in two dozen words of a 500-word corpus of Northern Sangtam, the main difference from Kauffman's description being that the lip vibration is preceded by an apical- or laminal-dental occlusion. Like most of the other obstruents of this language, the prestopped bilabial trills demonstrate a two-way phonemic contrast in voice onset time, and these are observed to be in contrastive distribution with /t/ and /tʰ/ as well as all other members of the plosive and affricate series.

Very little is presently known about Sangtam, therefore the following section will serve to briefly outline background information on the language before Section 3 discusses the consonant phonemes and sound changes occurring in the phonological inventories of some speakers. Section 4 then presents the results of static palatography, and Section 5 concludes with a summary of the findings and their broader theoretical implications.

2. THE SANGTAM LANGUAGE

Sangtam is one of approximately two dozen Tibeto-Burman languages spoken in the hill state of Nagaland, north-east India. According to the 2001 Census of India, there are 84,300 speakers. Although the language has been identified as vulnerable by UNESCO's Endangered Languages Programme, intergenerational transmission was observed to be in a healthy state in Trongar and Chare, two Sangtam-speaking villages visited in 2011-2012, and young children continue to acquire the language as their mother tongue. There are at least two major dialects:

northern and southern. The northern dialect is spoken in the Longkhim sub-division and Chare circle of Tuensang district, and the southern dialect is spoken in Kiphire district (newly created in 2004), which was formerly the southernmost part of Tuensang district. The historical literature mentions a third central dialect known as Thukumi [4], but this is based on a very slim amount of data collected over a century ago by an amateur and is yet to be verified. ‘Thukumi’ is more likely to be merely an exonym used by the neighbouring Sumi to refer generally to Sangtam speakers of Tuensang district.

The data in this paper represent the northern dialect of Sangtam, and specifically the variety spoken in Trongar and Alisopor villages.

2.1. Genetic affiliation

On the basis of lexical, phonological and morphological correspondences, Sangtam forms a lower-level subgrouping with the Ao, Lotha and Yimchungrü languages of central Nagaland [5, 6, 7]. Beyond this level the Ao subgroup’s genetic affiliation remains uncertain. It has long been suspected that the languages of central and southern Nagaland are closely related, perhaps ultimately forming an intermediate node of an independent branch of Tibeto-Burman, but robust evidence for this has so far eluded researchers. All the languages of Nagaland have traditionally been grouped under the label “Naga”, but this term has no credibility as a linguistic label, as the languages it lumps together are known to belong to at least two distinct branches of Tibeto-Burman. Until more work can be done it is prudent to remain non-committal with respect to branch affiliation, other than to acknowledge that the Ao subgroup and the Angami-Pochuri subgroup of southern Nagaland historically shared an innovative overcounting cardinal numeral system [8]. While this is certainly an interesting and relevant finding, the current evidence for establishing a common ancestor for the languages of central and southern Nagaland is still little more than ‘type-identifying’ [9], and more work on this topic is needed.

2.2. Typological overview of consonantal phonology

In most respects Sangtam is a fairly typical language of the Ao group, with consonants demonstrating six places of articulation (bilabial, dental, postalveolar, palatal, velar and glottal) and four corresponding manners of articulation (plosive, affricate, fricative, nasal and approximant). The most noteworthy peculiarity is an additional series of prestopped bilabial trills. Plosives and affricates demonstrate a two-way contrast in voice onset time that opposes voiceless aspirated and voiceless

unaspirated segments – a phonological feature shared by all Tibeto-Burman languages of central Nagaland except for the Chungli dialect of Ao.

Sangtam additionally has retroflex plosives with the same two-way voice onset time contrast. Retroflex consonants occur in all members of the Ao group, but this manner of articulation is more commonly restricted to approximants. The palatal stops are also unique to Sangtam; other languages of the Ao group typically have just three distinct places of articulation for oral plosives. Sangtam appears to be the only member of the Ao group in which the glottal stop functions as a segmental, as opposed to prosodic, phoneme [e.g. cf. 10, 11]. This permits it to occur word internally, whereas in the other languages of the group it is restricted to the word-final position only. Lastly, Sangtam is a syllable-based tonal language with three level tones, in common with the Mongsen Ao and Chungli Ao.

3. A PHONEME INVENTORY IN FLUX

Table 1 below lists the consonant phonemes of the northern dialect of Sangtam, as spoken in the village of Trongar. There are six distinct places of articulation and six manners of articulation resulting in a consonant inventory of twenty-eight phonemes for most speakers.

Table 1: Consonant phonemes of Northern Sangtam (Trongar Village variety)

	Bilab.	Dental	Retrofl.	Palatal	Velar	Glottal
Plosive	p p ^h	t t ^h	[t̪] [t̪ ^h]	c c ^h	k k ^h	ʔ
Affricate		ts ts ^h		tʃ tʃ ^h		
Prestopped trill	(t̪b) t̪b ^h					
Nasal	m	n		ɲ	ŋ	
Fricative	(v) (f)	s		ʃ	x	h
Approximant		l	ɭ	j		

The labial-dental fricatives /f, v/ are marginally attested. They are unlikely to have entered the consonant inventory via loanwords, because they occur in lexical items representing core vocabulary,

e.g. /fλ/ ‘body’, /afλ/ ‘older sister’, /fλza/ ‘dog’, /fətfɪŋ/ ‘hoe’, /kùva/ ‘hair of head’, and /avéʔ/ ‘land leech’. Kauffmann [3] transcribes one example of Körper ‘body’ as *a-mpwó*, so another possibility is that these segments have undergone a sound change that was still evolving at the time of documentation. It may also be significant that a labial-dental fricative is not represented in his pronunciation guide, yet paradoxically he uses *f* to transcribe some words, e.g. Hacke ‘hoe’ is represented as *fótsing*, and Hund ‘dog’ is transcribed as *fözá*. The rarity of labial-dental fricatives (just eight instances in my ca. 500-item word list) renders their status as phonemes provisional until the corpus can be augmented by additional data.

The retroflexes have a rhoticized quality to their release, which suggests that they have developed historically from a cluster involving a dental plosive plus a retroflex approximant that has subsequently been phonologized as a single segmental phoneme. Complex onsets are not permitted in Sangtam, so this rules out treating them synchronically as /t+ɹ/ clusters.

It is noteworthy that in younger generations, (i.e. those less than 35 years of age) a substantial number of speakers appear to be losing the phonemic contrast between the prestopped bilabial trills and the dental plosives, and other sounds are also undergoing mergers. This might be expected in large towns such as Kohima and Dimapur, where stable multilingualism could lead to language change as a result of intensive contact situations, but the very same mergers are found in the recorded data of speakers in their thirties or younger who reside in Trongar village. Specifically, the sound changes were noted in the speech of four of the six speakers I worked with in Trongar, as well as in the speech of three other speakers living in multilingual Dimapur, and changes are generally in accordance with a shift away from markedness. That they even occur in a village variety suggests that some significant sound changes could be in process in the Sangtam speech community, and that younger speakers are leading the way. The following phonemic shifts were observed in the recorded data:

- /x/ shifting to /h/
- /tʰ/ shifting to /t/
- /tʰ/ shifting to /tʰ/
- /Vŋ/ shifting to /Ṽ/

4. PRESTOPPED BILABIAL TRILLS

As noted in Section 3, the pre-stopped bilabial trills demonstrate a two-way voice onset time contrast, in common with the plosive and affricate series. Speakers initiate this sound by forming a complete

apical- or laminal-dental occlusion; this is explosively released into a bilabial trill, which can be voiced, or voiceless and considerably aspirated. The following list is a representative sample of words in which the prestopped bilabial trills occur both word-initially and word-internally. Note that with the possible exception of ‘drum’, none of these words can be considered even vaguely onomatopoeic.²

Sound file:



1. /tʰbʰλ/ ‘plate’
2. /tʰbʰà/ ‘unkempt’
3. /tʰbʰéʔ/ ‘cut deeply’
4. /tʰbʰaŋ/ ‘drum’
5. /tʰbʰλʔ-re/ ‘dismantle-PRES’
6. /tʰbʰλ/ ‘(garden) fence’
7. /tʰbʰà/ ‘soothe, be relieved’
8. /tʰbʰaŋ/ ‘needle’
9. /atʰbʰλ/ ‘concealed side’
10. /atʰbʰa/ ‘mother’

The following (sub-)minimal serve to demonstrate that the prestopped bilabial trills are in contrastive distribution with the dental plosives.

[tʰáʔ]	‘head’	[tʰbʰaŋ]	‘drum’
[tʰλmkò]	‘finish’	[tʰbʰAtìŋ]	‘crossbow’
[tàku]	‘nine’	[tʰbʰàŋ]	‘needle’

The strength and duration of the resulting bilabial trill is determined by the following vowel and is longer if the vowel is [+hi, +back], otherwise the bilabial component may be reduced to a single tap. If the jet of air resulting from the release is unaspirated or only weakly aspirated, then it may instead produce a fricative. Similar findings were reported for Wari’ prestopped bilabial trills [1], which were more likely to be fully articulated when followed by a high back rounded vowel.

Figures (1–2) below respectively demonstrate spectrograms of voiced and voiceless aspirated prestopped bilabial trills in the words /tsutʰbʰíλ/ ‘relative’ and /litʰbʰλ/ ‘arrow’.

Figure 1: Wave form and spectrogram of /tsutʰbʰíλ/ ‘relative’.

Sound file:

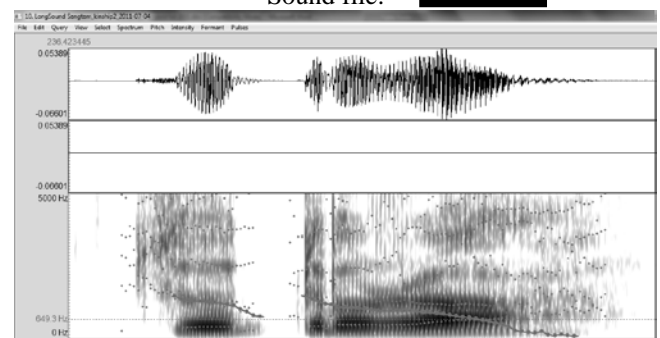
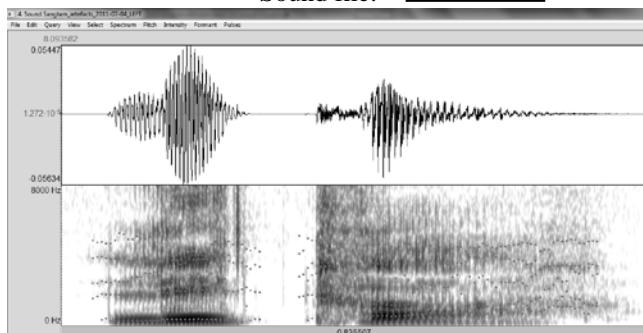


Figure 2: Wave form and spectrogram of /litʰə̃/ ‘arrow’

Sound file: 



Palatograms and linguagrams were made to further investigate the manner of articulation of prestopped bilabial trills by four speakers. The images of Figures (3-4) are representative of the results obtained and demonstrate the apical-/laminal-dental occlusion that precedes the trilled release.

Figure 3: Palatogram of /tʰə̃/ ‘cut deeply’



Figure 4: Linguagram of /tʰə̃/ ‘cut deeply’



The prestopped bilabial trills occur as syllable onsets before all vowels and have been attested in two dozen words. While this makes them uncommon consonants in terms of their overall frequency vis-à-vis the other consonants, their

ability to occur before a range of vowels and in contrastive distribution with the dental plosives justifies according them phonemic status in Sangtam. This gives Sangtam the distinction of being the only language in the world in which prestopped bilabial trills are found to be phonemic.

Figure 4: Image demonstrating the methodology of videoing frontal and lateral views of the speaker as he utters tokens



5. CONCLUDING DISCUSSION

From the perspective of the Ao group of languages, the prestopped bilabial trill is an innovative phoneme that is not attested in Yimchungrü, Lotha, or any dialects of Ao, or in any contiguous language of Nagaland. Furthermore, unlike Oro Win and Wari' [1], it is not restricted to back rounded vowels. According to Ladefoged & Maddieson [12]

... all bilabial trills historically developed from a sequence of prenasalized bilabial stop followed by a relatively high back rounded vowel ... These segments remain prenasalized and contain a short oral stop phase which is released into a trill.

However, a comparison of the Sangtam data to reconstructed forms of Proto-Tibeto-Burman reveal that these segments do not originate uniquely from a nasal + plosive + high back vowel sequence, despite the fact that this appears to be the most widely reported source of bilabial trills in the world's languages [13, 14]. The only Sangtam examples of this are /nə̃tʰə̃/ ‘deaf’ (< Proto-Tibeto-Burman [PTB] *m-baŋ) and kinship terms containing the root /atʰə̃/ ‘mother’ (< PTB *m-na), both of which occur with a reconstructed bilabial nasal prefix [15].

Most of the two dozen Sangtam words containing a prestopped bilabial trill are not cognate with PTB roots containing a nasal prefix and plosive initial. This suggests that there could be an alternative diachronic pathway for the development of bilabial trills in Tibeto-Burman languages. It may be relevant that a number of Qiangic languages of south-western Sichuan are reported to have bilabial trills that are realized under certain phonetic

conditions. A distinguishing feature of the Southern Qiangic languages of the Tibetan Autonomous County of Muli, for example, is that /u/ is realized as a syllabic [b] in the environment after bilabial and apical stops [16]; even more significantly, /u/ is realized as a bilabial trill after dental plosives in Mianning Lizu [17]. From these reports and evidence from other languages, it would seem that the small aperture and laxness of the protuded lips associated with the articulation of high back vowels could be the primary impetus for a bilabial plosive developing a trilled release.

Further investigation of the historical development of prestopped bilabial trills must wait until more work can be carried out on Sangtam.

6. REFERENCES

- [1] Ladefoged, P., Everett, D. 1996. The status of phonetic rarities. *Language*, Vol. 72.4 794-800.
- [2] MacEachern, M. R., Kern, B., Ladefoged, P. 1997. Wari' phonetic structures. *Journal of Amazonian Languages*, vol. 1, n.1, 3-28.
- [3] Kauffmann, H.E. 1939. Kurze Ethnographie der nördlichen Sangtam-Naga, (Lophomi), Assam. *Anthropos* 34: 207-245.
- [4] Grierson, G.A. 1903-1928. *Linguistic Survey of India* Vol 3, Part 2.
- [5] Marrison, G.E. 1967. The classification of the Naga languages of north-east India. Vol. I (Texts) and Vol. II (Appendices). Unpublished PhD dissertation, SOAS, University of London.
- [6] Burling, R. 2003. The Tibeto-Burman languages of Northeastern India. In *The Sino-Tibetan languages*, Thurgood, G., LaPolla, R.J. (eds.), 169-191. London/New York: Routledge.
- [7] Bruhn, D.W. 2014. A phonological reconstruction of Proto-Central Naga. Unpublished PhD dissertation, University of California, Berkeley.
- [8] Coupe, A.R. 2012. Overcounting numeral systems and their relevance to sub- grouping in the Tibeto-Burman languages of Nagaland. *Language and Linguistics*, Vol. 13.1: 193-220.
- [9] Nichols, J. 1996. The comparative method as heuristic. In Durie, M. & M. Ross (eds.) *The comparative method reviewed: Regularity and irregularity in language change*, 39-71. Oxford: Oxford University Press.
- [10] Coupe, A.R. 2003. *A phonetic and phonological description of Ao: A Tibeto-Burman language of Nagaland, north-east India*. Canberra: Pacific Linguistics.
- [11] Coupe, A.R. 2007. *A grammar of Mongsen Ao*. Berlin/New York: Mouton de Gruyter.
- [12] Ladefoged, P., Maddieson, I. 1996. *The sounds of the world's languages*. Malden, MA: Blackwell.
- [13] Maddieson, I. 1989. Aerodynamic constraints on sound change: The case of bilabial trills. *UCLA Working Papers in Phonetics* 72: 91-115.
- [14] Olson, K.S. 2015. The bilabial trills in Port Sandwich (Vanuatu) in 1774. *Diachronica* 32.1: 105-114.
- [15] Matisoff, J.A. 2003. *Handbook of Proto-Tibeto-Burman: System and philosophy of Sino-Tibetan Reconstruction*. Berkeley: University of California Press.
- [16] Chirkova, Katia. 2012. The Qiangic subgroup from an areal perspective: A case study of languages of Muli. *Language and linguistics* 13.1: 133-170.
- [17] Yu, D. 2014. Proto-Ersuic. Unpublished PhD dissertation, University of California, Berkeley.

*Field research on Sangtam was made possible by a Singapore Government Ministry of Education AcRF research grant (MOE2012-T2-100: Exploring the crossroads of linguistic diversity: Language contact in Southeast Asia). I am extremely grateful to Mr S. Manen Sangtam, Reverend Tridong, and other members of the Sangtam community for their help and introductions, without which this research would not have been possible.

¹ Thanks to Jan Gorisch for translating the German.

² The speaker is from Alisopor village, so this might account for the alveolar trill in the fifth example, or it could be a stylistic variant of the retroflex approximant. He also utters the words with a list intonation, but this has no bearing on his production of the prestopped bilabial trills.