

# Phonetics and phonology of fricative vowels in Lus

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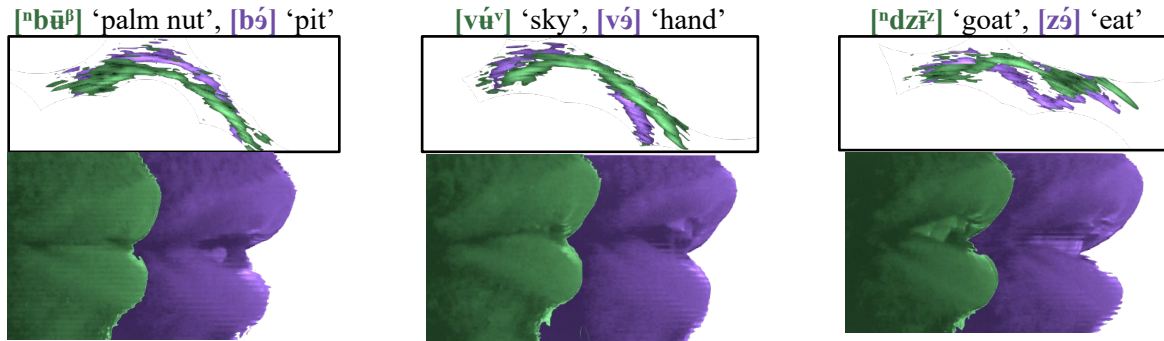
Based on new fieldwork on Lus ([nɸ], E. Grassfields, Cameroon) we propose refinements to the existing analysis of the vowel system (Eyoh & Hedinger 2013; McLean 2014): we find that orthographic <i> conflates a mid-high central vowel /ə/ and three fricative vowels (Figure 1A). The fricative vowels are in complementary distribution with each other, but in contrastive distribution with all other vowels, and occur only after onsets with the same constriction location (Figure 1B): a lip-compressed vowel occasionally produced with trilling [ɸ<sup>β</sup> ~ β] after bilabials; a labiodentally constricted vowel [ɸ<sup>v</sup>] after labiodentals; and a vowel with an alveolar constriction [i<sup>z</sup>] after alveolar fricatives and affricates. These phonotactics are similar to other Grassfields languages such as Babanki (Anderson 2014; Faytak & Akumbu 2021), as well as languages further afield including Mandarin Chinese (Lee-Kim 2014).

Articulatory and acoustic data from four speakers (2F, 2M) support the proposed contrasts. Ultrasound data show that fricative vowels have a fronted and flattened tongue posture relative to /ə/ after a similar onset; video data show that [ɸ<sup>β</sup> ɸ<sup>v</sup>] exhibit their expected labial constrictions (Figure 2). Acoustic analysis of formant frequencies and aperiodicity reveals some overlap in F1-F2 space, but also reveals elevated fricative noise for [ɸ<sup>β</sup> ɸ<sup>v</sup> i<sup>z</sup>] compared to /i y ə u/. We discuss the implications raised by vocalic contrasts based on extra constriction or frication, both for phonological representation of vowels and for orthography development in the Grassfields, where such contrasts may often go unnoticed.

	Orthog.	Phonetic	gloss
[ɸ <sup>β</sup> ]	<sup>n</sup> bī	[ <sup>n</sup> bū <sup>β</sup> ]	‘palm nut’
[ə]	<sup>n</sup> bì	[ <sup>n</sup> bə]	‘rain’
[ɸ <sup>v</sup> ]	ví	[vú <sup>v</sup> ]	‘sky’
[ə]	vì	[və]	‘hand’
[i <sup>z</sup> ]	zì	[zì <sup>z</sup> ]	‘tell lie’
[ə]	zì	[zə]	‘eat’

Onset	[ɸ <sup>β</sup> ]	[ɸ <sup>v</sup> ]	[i <sup>z</sup> ]	Other V
/b <sup>n</sup> b/	✓	*	*	✓
/f <sup>n</sup> f <sup>v</sup> v <sup>n</sup> v/	*	✓	*	✓
/s <sup>n</sup> z z <sup>n</sup> z ts <sup>n</sup> <sup>n</sup> ts dz <sup>n</sup> dz/	*	*	✓	✓
Other C	*	*	*	✓

**Figure 1:** Vowel contrasts obscured by use of orthographic <i> (A) and onset-vowel phonotactics under the new analysis (B).



**Figure 2:** Position of the tongue surface (ultrasound imaging, top) and lips and jaw (video in profile, bottom) for selected vowel pairs at acoustic vowel midpoints. Anterior is right in all images; fricative vowels are shown in **green** and /ə/ in **purple**. Data for /i y u/ omitted for space.

### References

- Anderson, S. (2014). A phonological sketch of Isu. SIL Cameroon.
- Eyoh, A. & Hedinger, R. (2013). Mfumte orthography guide. Ms, SIL Cameroon.
- Faytak, M. & Akumbu, P. (2021). Kejom (Babanki). *JIPA*, 51(2), 333-354.
- Lee-Kim, S. (2014). Revisiting Mandarin ‘apical vowels’: An articulatory and acoustic study. *JIPA*, 44(3), 261-282.
- McLean, G. (2013). A Sketch Grammar of the Central Mfumte Language. Ms, SIL Cameroon.