Close vowel contrasts in Abar revisited: height or ATR?

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Overview. The vowel series /e, o/ and /ɪ, ʊ/ in Abar (Yemne-Kimbi, Cameroon) have been described as similar in formant frequencies but distinguished by other spectral parameters, and most speakers realize "high" /ɪ, ʊ/ with the same or higher F1 than "mid" /e, o/ (Lovegren 2013). This arrangement suggests a contrast in advanced tongue root (ATR) rather than height (Starwalt 2008; Casali 2008), such that Lovegren treats /ɪ, ʊ/ as [+high,-ATR] and /e, o/ as [-high,+ATR]. The present study aims to characterize the acoustic basis of these contrasts to confirm whether tongue root activity actually plays a role. Contrasts involving height are often misattributed to ATR in the Bantoid area (Starwalt 2008; Allen et al. 2013; Rolle et al. 2020); furthermore, ATR is typically an active feature in ATR harmony when present (Casali 2008), but Abar lacks ATR and height harmony.

Methods. Six speakers of Abar (3M, 3F) produced target words in a frame sentence 5-6 times. Target words contained the vowels /i, ɪ, e/ and /u, ʊ, o/ in open stem syllables (1,934 tokens collected). The vowel /ɛ/ was not collected as it is rare in stems; no stem [ɔ] occurs (Lovegren 2013). Formant and voice quality measures were extracted at vowel midpoint using *praatSauce*, z-scored by speaker, and submitted to linear mixed effects models (measure ~ vowel + (1|word) + (1|speaker) + (1|onsetC)), separately for front and back vowels. Post-hoc comparisons are used to gauge the degree of contrast for each vowel pair on each acoustic dimension.

Results. Small, consistent F1 differences are evident for all vowel pairs examined (Figure 1), *contra* Lovegren (2013), though overlap is considerable. Post-hoc comparisons (Table 1) confirm the primary role of F1 in contrasting all investigated vowel pairs and reveal secondary roles for F2, B1 (bandwidth of F1), and H1-H2* (a measure of spectral tilt). The availability of these spectral cues for /ɪ-e/ and the "reversal" of F1 values for /ɪ-e/ and /ʊ-o/ *suggest* the involvement of ATR rather than a simple height contrast, but an articulatory study may be needed to *confirm* this, since the back vowels do not appear to contrast on non-formant measures diagnostic of ATR involvement.

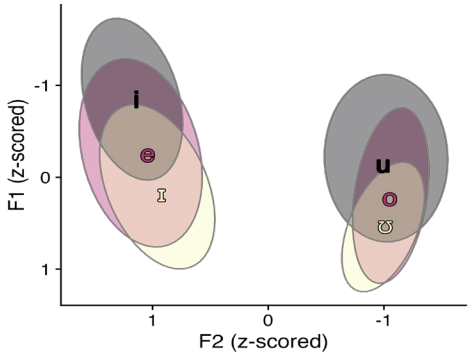

Figure 1: Vowel distribution in F1-F2 space (95% confidence ellipses).

	F1	F2	B1	H1-H2*
i-e	-0.567	-	-	-
i-ɪ	-0.998	0.284	0.424	-
e-ɪ	-0.431	-	0.414	0.513
u-o	-0.290	0.106	-	-
u-ʊ	-0.596	0.088	-	-
o-ʊ	-0.306	-	-	-

Table 1: Post-hoc comparisons; "-" indicates non-significant difference (p>0.05)

References

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