

## Allophony and history of Mee velar lateral

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Velar laterals are a rare class of sounds that involve posterior closure and lateral release (François, 2010; Ladefoged et al., 1977; Blevins, 1994). This paper presents new data on velar lateral allophony in the Paniai Lakes Papuan language Mee (a.k.a. Ekari: Doble, 1987; Hyman & Kobepa, 2013, a.o.). The velar lateral sound appears with dorsal closure and lateral release [g<sup>l</sup>] before front vowels and with uvular closure and fricative release [g<sup>ʙ</sup>] before back vowels. This allophony pattern is documented here for the first time, and it has interesting implications for the historical sources of velar laterals. [g<sup>ʙ</sup>] is also reported as a marginal sound in Xumi (Chirkova & Chen, 2013).

**Data.** Our main dataset comes from a male speaker of Mee. The patterns of velar lateral allophony were verified in elicitations with one additional speaker. Mee consonant inventory includes /p b t d k g m n w j/. The velar lateral corresponds to /g/ in this system (see also Doble, 1987), and therefore we propose to treat it as an affricate rather than pre-stopped lateral or a sequence of two sounds (cf. François, 2010). Mee has five vowels /i e a o u/, each contrasting in length, and five diphthongs: /ei ai eu au ou/. Mee only allows CV syllables. The tonal contrasts are analyzed by Hyman & Kobepa (2013).

Examples in ((1), tones omitted) show that /g/ is pronounced [g<sup>l</sup>] before front vowels and diphthongs /ei eu/ (1a) and as [g<sup>ʙ</sup>] before back vowels and /ai au ou/ (1b). Short /i e/ are reduced and highly lateralized after [g<sup>l</sup>] (hence a breve sign in (1c)).

- (1) a. [g<sup>l</sup>e:g<sup>l</sup>e:] ‘to dry in the sun’; [jug<sup>l</sup>ei] ‘to crush’; [jag<sup>l</sup>i:] ‘to fall’  
b. [g<sup>ʙ</sup>a:ti] ‘ten’; [daɡ<sup>ʙ</sup>u] ‘room’; [eɡ<sup>ʙ</sup>ou] ‘to pull’  
c. [g<sup>l</sup>ĩdi:] ‘to take out’ [g<sup>l</sup>ěmo:] ‘cool’; [ag<sup>l</sup>ě] ‘floor, ground’; [dag<sup>l</sup>ĩ] ‘head’

We recorded a set of words with /g/ in each vocalic environment, each repeated three times in a carrier phrase [itoko \_\_ natidodou] ‘say \_\_ now’.

**Results.** The release of /g/ was found to be acoustically different before front vs. back vowels. Compared to the sonorous release for [g<sup>l</sup>], [g<sup>ʙ</sup>] release is less periodic since it is fricated and sometimes partially devoiced. To assess release periodicity, harmonics to noise (HtoN) ratio within 20ms of the closure offset was measured. [g<sup>l</sup>] showed more periodic release (mean HtoN 7.08 dB for [g<sup>l</sup>] vs. 5.47 dB for [g<sup>ʙ</sup>]), and this difference was significant based on lme model with item as random effect ( $\beta = 1.75$ ;  $SE = 0.45$ ;  $p < 0.001$ )

To assess a difference in /g/ constriction location, formant transitions into /g/ were measured at the 9/10 of V1 duration. The resulting vowel space is in Figure 1. F2 transitions into /g/ were analyzed with a lme model taking V1 quality and V2 frontness as fixed effects and item as a random effect. The significant V2 frontness effect ( $\beta = 210$ ;  $SE = 67$ ;  $p < 0.01$ ) is compatible with [g<sup>ʙ</sup>] closure being further back than that of [g<sup>l</sup>]. An expected significant effect of V1 quality was also found for all vowels. The interaction between V1 being [e] and V2 frontness was also significant. Overall, the results confirm our description of /g/ allophony: [g<sup>ʙ</sup>] and [g<sup>l</sup>] differ in both closure and release.

**Discussion.** While across languages velar laterals may emerge from stops (Tebay, 2018) or from rhotics (François, 2011), the emergence of lateral release quality is a puzzle. The connection between release quality and vowel frontness in Mee allows us to hypothesize that consonant-vowel coarticulation may be the source of modified release quality in these sounds. We suggest that a stage where consonant release quality changes with the following vowels (as in Mee) could be a precursor to the emergence of a general phoneme realized as velar lateral across the board (as e.g. in Hiw, François (2010)). This hypothesis remains to be tested with additional phonetic data on velar laterals.

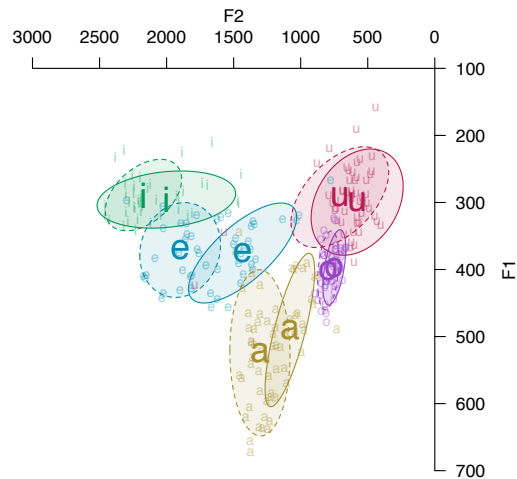


Figure 1: Formant transitions from V1 into [gʰ] (dotted line) and [gʱ] (solid line).

## References

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