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Syllabic and emphatic conditioning of /l/ in Levantine Arabic: an auditory, acoustic and articulatory analysis

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Throughout the world's languages, typologies of /l/-darkening systems are often reported as having one of two patterns: those which have an allophonic distinction between a lighter, more coronal variant of /l/ and a darker, more retracted variant, and those that do not. However, comparatively little research has focussed on languages whereby there seems to be allophony conditioned by something other than syllabic structure. The present study is an investigation into lateral variation in Levantine Arabic. Early work by Delattre [1] suggests that, like German, Arabic has a clear 'flat' /l/ regardless of its position in the syllable. This is of interest, particularly as onset/coda realisations of /l/ in languages such as English have been argued to be a natural articulatory consequence of the dorsal gesture of the following/preceding vowel and darkness is correlated with duration [2,3]. An acoustic investigation of bilingual children's lateral productions by Khattab [4] suggests that a dual gestural account may not be appropriate for Arabic, but no instrumental work has so far been carried out to corroborate that. Conversely, conditioning of Arabic laterals has been claimed to be predicted by the presence of an emphatic (i.e. pharyngealised) consonant. /l/s in proximity to an emphatic consonant are said to be pharyngealised themselves, but it is not clear whether this is an allophonic distinction or simply a gradient effect of co-articulation. The present study investigates /l/ patterning in Levantine Arabic in a variety of syllabic and emphatic environments to test the claims in the existing literature.

Eight speakers of urban Levantine Arabic (Lebanese, Syrian, Jordanian, Palestinian; 4 males 4 females) were recorded reading words with /l/ in plain onset and coda positions across a range of vowel contexts, and in various conditions (e.g. adjacent to plain or emphatic consonants). Words were presented in Arabizi, an informal chat alphabet used widely by speakers in social media settings, in order to avoid eliciting standard forms. We use combined auditory, acoustic and ultrasound analysis (using GAMMs) to consider differences in /l/ articulation across a range of linguistic predictors.

Results confirm the lack of an onset-coda distinction for plain /l/ for all speakers, as shown in the sample GAMM results (fig 1, left) and as supported in the acoustic analyses (fig 2). The only reliably darker variants occur in emphatic contexts (e.g. fig 1, right). In fact, /l/s in onset position (preceding emphatics) exhibited lower F2-F1 than in coda position (following emphatics). This is further conditioned by the vocalic contexts, with /i/ contexts demonstrating stronger anticipatory than progressive assimilation (fig. 2, right), while /a/ triggered emphasis spread in both contexts (fig. 2, left). Our results demonstrate strong language-specific patterns for lateral realisation in Levantine Arabic which add experimental credence to the 'flat' /l/ claim regardless of syllable position and which show vowel-conditioned darkening effects in emphatic contexts.

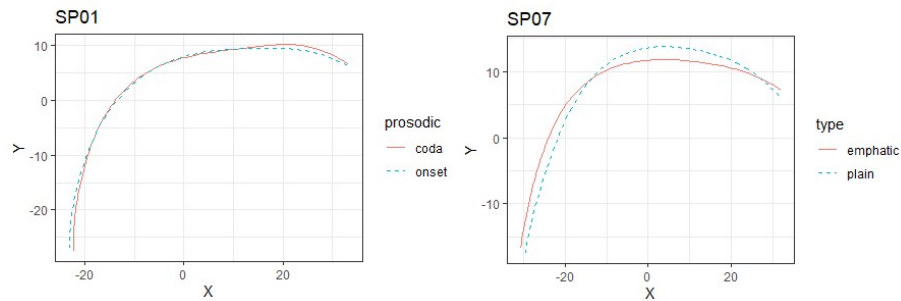


Figure 1: Estimated tongue contours of example speakers at /l/ midpoint based on the polar GAMMs results for plain (left) vs emphatic (right) contexts.

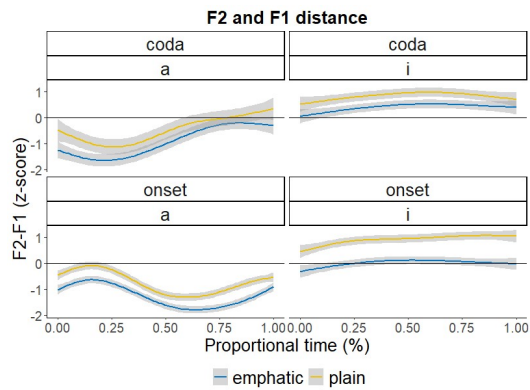


Figure 2: Z-scored F2-F1 across the LV and VL sequences in plain (yellow) and emphatic (blue) and in each of /a/ (right) and /i/ (left) vowel contexts in onset (bottom) vs coda (top) position.

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