

Variation in emphasis spread in two Palestinian dialects of Arabic

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Emphasis in Arabic can spread from an emphatic consonant to a neighboring vowel. In phonology, the emphasis spread is typically represented as spreading the [RTR] feature from the consonant to the adjacent vowel (Davis, 1995; Watson, 1999). The set of consonants that can trigger emphasis spread includes not only coronal emphatic obstruents [t, d, s, ڦ] but also the uvular stop [q] (McCarthy, 1994). Most noticeable manifestation of emphasis spread on a vowel is back articulation of the low vowel [ɑ] next to emphatic consonants. Acoustic studies show that emphatic vowels are characterized by higher F1 and lower F2 frequencies (Jongman, Herd, Al-Masri, Sereno, & Combest, 2011).

Previous research shows that emphasis spread is often gradient in phonetics. Vowels in Jordanian Arabic have weaker emphasis when they occur farther from the initial emphatic consonant (Jongman et al., 2011). Weakening of emphasis can also result in loss of the contrast in consonants: e.g. the emphatic /q/ phoneme is often realized as non-emphatic [g] or [?] in Levantine and Gulf Arabic (Watson, 2002); the coronal emphatic [d] is lost in some Gulf Arabic dialects (Johnstone, 1967). However, the effect of the consonant category on gradience in emphasis has not been studied.

This study investigates the effect of a consonant on a vowel when the original MSA (Modern Standard Arabic) emphatic consonant /q/ is replaced with a non-emphatic consonant in a dialect. We recorded 15 speakers from two vernacular dialects of Palestinian Arabic: the Bedouin dialect, in which word-initial /q/ is realized as the velar stop (hence, the [g]-dialect), and the urban dialect, in which /q/ is realized as the glottal stop (hence, the [?]-dialect). All participants were females raised in Palestinian communities in Qatar. Each speaker produced (read) 30 target words in two modes: in their native dialect and in MSA. Formant frequencies were measured at the midpoint of the vowel [ɑ] following the initial stop in 900 target words. The F2-F1 difference index was then calculated as a single measure of vowel emphasis, with lower numbers indicating higher degree of emphasis.

The results show (see the chart below) that vowels after [q] in the MSA mode were produced as emphatic, with no significant difference in emphasis between two groups ($p = 0.441$). The degree of emphasis differed significantly in the Dialect mode. The index was higher in the dialect mode for both dialect groups ($D_{[g]\text{-dial}} = 520 \text{ Hz}$, $p < 0.0001$; $D_{[?]\text{-dial}} = 134 \text{ Hz}$, $p < 0.01$) suggesting emphasis on a vowel was weaker in both dialects. This difference was gradient, though, as vowels in the [?]-dialect had stronger emphasis than vowels in the [g]-dialect ($D = 349 \text{ Hz}$, $p < 0.0001$).

The findings suggest that degree of emphasis in Arabic dialects might be the result of consonant-vowel interaction. Sound changes that lead to loss of emphasis on a consonant may not fully affect emphasis on the adjacent vowel. Loss of emphasis in vowels is a gradient process that depends, among other factors, on the category of the adjacent consonant.

