

Geminate patterning in Arabic: an ideal case for the mutual influence between phonetics and phonology

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The phonological representation of gemination has been hotly debated in the literature, with skeletal and moraic approaches being the most dominant (e.g. Goldsmith, 1976; Davis, 2011; Hayes, 1989; McCarthy, 1979; McCarthy & Prince, 1990; Ringen & Vago, 2011; Watson, 2007). Studies looking for evidence of one or the other have typically explored the relationship between prosodic weight, phonological structure, and phonetic timing across languages. In work on Arabic, researchers have argued for a moraic view of syllable timing (e.g. Broselow, 1995; Broselow et al, 1995; 1997; Davis, 1999), but whether or not weight correlates with phonetic timing has until recently been debated. Our data from Lebanese Arabic (LA) provides robust phonetic evidence for a moraic theory of weight (e.g. Khattab & Al-Tamimi, 2014); a look at patterns of duration for medial singleton and geminate consonants and their surrounding vowels in LA shows that a bimoraic constraint, rather than whether syllables are open or closed, determines the degree of temporal compensation of vowels preceding singleton and geminate consonants.

In terms of non-durational indices for gemination, we present evidence for relatively minor but consistent fortition effects on target geminate consonants and their preceding vowel (Al-Tamimi & Khattab, 2011; 2015). These include intensity, fundamental frequency, and spectral properties of the consonants and their surrounding vowels, as well as voice quality effects. The results highlight [+tense] as a secondary feature for the singleton-geminate contrast in LA, with the degree of robustness of this feature varying across place and manner of articulation of the consonant and interacting with intrinsic duration. In the process of phonological acquisition, however, children initially follow various paths to the acquisition of gemination, with some of their productions exhibiting tenseness as a primary feature, and others treating length as a prosodic cue which is freely applied to any segment(s) in words with geminate consonants before more target-like behaviour is evident. An investigation of the adult input to children shows that high variability in consonant length production in CDS is partly responsible for the different paths that the children seem to follow; another source of variability comes from the adapted length of French and English loan words in the adult language, leading to the salience of phonetic length at the expense of a phonological contrast.

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