

Evidence for the phonetic basis of Campidanese Sardinian metaphony

This study presents preliminary phonetic data on Campidanese Sardinian metaphony, revealing details that existing phonological descriptions have missed. Metaphony is a form of vowel harmony where the height of particular vowels depends on the height of vowels in neighboring syllables. Previous descriptions of Campidanese (Virdis 1978, Bolognesi 1998, Frigeni 2003, Torres-Tamarit *et al.* 2017) assert that the height of mid vowels depends on the height of following vowels: mid vowels are lower when preceding low or mid vowels, and higher when preceding high vowels, with exceptions to be discussed below. The basic pattern is illustrated in (1), with stems that alternate depending on the suffix that is attached to them. The same vowel is realized as high-mid before an *-u/* suffix, but low-mid before an *-a/* suffix.

(1) Basic metaphony pattern in Campidanese (based on Bolognesi 1998)

Before masc. suffix <i>-u/</i>	Before fem. suffix <i>-a/</i>	Gloss
[niedu]	[nieda]	‘black’
[veru]	[vera]	‘true’
[nou]	[noa]	‘new’

The works cited above point out two aspects of Campidanese metaphony that make it unusual within the Romance languages: the pattern is said to be *allophonic* and *phonologically opaque*. It is allophonic because high-mid and low-mid vowels don’t otherwise contrast in the language: the high-mid variants appear only before syllables with high vowels. It is opaque because only final vowels that are high *in underlying representations* trigger the process; surface high vowels that derive from underlyingly mid vowels do not. According to Bolognesi (1998) and the other works cited above, only [i], [u], and [a] surface word-finally. In most analyses (and in diachronic development), this is because mid vowels neutralize to high in word-final position. While UR high and mid vowels are thus phonetically identical word-finally, only the UR high vowels trigger metaphony on a preceding mid vowel. This results in opaque minimal (and near-minimal) pairs, as shown in (2).

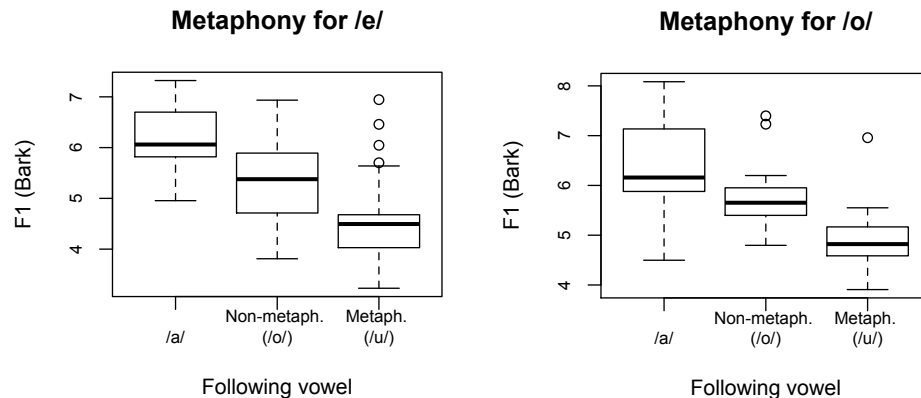
(2) Opacity/abstractness in Campidanese metaphony

Before suffix with /ɔ/ → [u]		Before suffix with /u/ → [u]	
/sɛ-ɔ/ → [sɛ-u]	be-1 sg.pres	/tʃɛ-u/ → [tʃe-u]	sky-masc.sg
/sɔn-ɔ/ → [sɔn-u]	play-1 sg.pres	/sɔn-u/ → [son-u]	sound-masc.sg

We report here on a preliminary phonetic study of both target vowels and suffixal triggering vowels in Campidanese metaphony. While gathering materials for a different study, it was noted impressionistically that metaphony seemed inconsistent across speakers and lexical items, that some speakers seemed to occasionally produce mid vowels in word-final position, and that the realization of mid vowels in metaphony contexts varied widely from near-low to near-high. The current study analyzes F1 values for all putative metaphony cases available in our recordings of 15 Campidanese speakers, as well as comparable tokens that are not expected to trigger metaphony, as in (1-2). There are a limited number of tokens (223 from 15 speakers) and the study should be seen as exploratory. The results raise a number of interesting questions that should be investigated in a larger followup study.

As shown in (3), there are in fact at least three phonetically distinct height realizations for mid vowels depending on the height of the following vowel. In addition to the expected metaphony effect on F1 before underlyingly high vs. mid final vowels (Linear mixed-effects regression w/ random intercepts for subject and word: $\beta = 0.93$ Bark, $t = 3.54$), mid vowels are systematically lower before /a/ than they are before UR mid vowels ($\beta = 0.60$, $t = 2.49$).

- (3) Three-way split in mid-vowel height: before /a/, before /ɔ/ → [u], and before /u/ → [u]



While the overall effect of metaphony is robust enough across speakers and words to come out statistically significant in a model that generalizes over these random variables, there is substantial variation across speakers in the degree and even the presence of metaphonic raising (by-speaker difference scores range from -0.3 to 2.5 Bark). Some speakers also produce metaphony-triggering *final* vowels phonetically higher than non-triggering final vowels (hypothesized to be mid in URs). Again, this is quite variable across subjects (differences range from -1.2 to 1.4 Bark, median 0.4), but intriguingly, it seems to be linked to the magnitude of metaphony on *target* vowels: speakers with larger phonetic raising effects in metaphony contexts also produce, on average, larger differences between the putatively identical triggering and non-triggering suffixal vowels ($r = 0.33$, $p = 0.02$).

These findings have implications for phonological approaches to metaphony: while we don't intend to claim that *all* differences in mid-vowel height can be reduced to phonetically transparent differences in following vowels, it appears that metaphony tracks overt phonetic differences in triggers *to a greater extent* than previous accounts would predict. The pattern is thus in some sense *less opaque* than we might have expected. There is also a substantial degree of variability between speakers and between lexical items. Illuminating the fine quantitative details of how trigger-vowel phonetics and target-vowel phonetics relate to one another for individual speakers will require a larger study with more varied materials, which we hope to pursue in the future.

References

- Bolognesi, R. (1998). *The Phonology of Campidanian Sardinian*. Amsterdam: HIL.
- Frigeni, C. (2002). Metaphony in Campidanian Sardinian: a domain-based analysis. *Toronto Working Papers in Linguistics* 20, 63–91
- Torres-Tamarit, F., K. Linke, & M.d.M. Vanrell. (2017). Opacity in Campidanian Sardinian metaphony. *Natural Language & Linguistic Theory* 35 (2), 549-576.
- Virdis, M. (1978). *Fonetica del dialetto Sardo Campidanese*. Cagliari: della Torre.