# Phonetic implementation of mid vowel contrasts across Italian varieties

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Italian /e ɛ/ /o ɔ/ are argued to be separate phonemes, but the distinction between high and low mid vowels is *marginal*: few minimal pairs separate them, meaning the contrasts have low functional load; in unstressed syllables, the distinctions neutralize to [e, o]; and regional patterns of mid vowel selection also affect the contrasts' implementation. Previous work has shown that speakers vary not only in their use of /e/ vs. /ɛ/ or /o/ vs. /ɔ/, but also in the accuracy of their intuitions regarding their own speech (Renwick & Ladd 2016). However, that study's design did not permit full consideration of regional factors. The present paper further explores variability in the mid vowel contrasts of Italian, using a large, balanced corpus of speech from 15 cities throughout Italy. We consider mid vowel variability both within and across dialects, at the level of individual lexical items, to evaluate the implementation of mid vowel contrasts across Italian varieties via empirical phonetic data.

Data are drawn from the roughly 100 hours of speech in the *Corpora e Lessici dell'Italiano Parlato e Scritto* (CLIPS; Leoni et al. 2007). Laboratory speech was gathered from a set of twenty sentences read by 240 speakers (16/city). Audio was force-aligned, and segment boundary locations were hand-checked; formant values (F1, F2) were automatically extracted at vowel midpoint, and filtered to remove outliers due to formant tracking errors. To provide a measure of vowel height unbiased by prescriptive quality or human intuition, each speaker's stressed mid vowel tokens were automatically assigned (using Lobanov-normalized F1, F2 values) to a phonetically high or low class, using a k-means clustering algorithm implemented in R. The classifications of specific lexical items are compared, and word-specific rates of high vs. low mid vowel realizations are calculated, to evaluate the consistency of speakers' phonetic realizations both within and across regions. The effect of phonological context, particularly syllable structure, on vowel height is also considered. Initial results indicate that while some words have consistent phonetic height at regional levels, others are highly variable even within single cities.

These findings have implications for the phonetic characterization of mid vowel distinctions in Italian varieties, and for models of phonological contrast that are restricted to a binary distinction between phonemes and allophones. Areas of regional or lexical inconsistency suggest that marginal contrastiveness is not a misleading consequence of pooling across diverse phonological systems, but that it is a local property, providing additional support for Renwick and Ladd's (2016) argument that the mapping of phonetically-distinct mid vowels to specific words is weak in Italian varieties. More broadly, this research contributes to evidence that marginal contrasts are cross-linguistically prevalent, that they affect perception and production, and that they have consequences for synchronic and diachronic phonological representations. Phonological theory must expand to accommodate them.

## References

Leoni, Federico Albano, Francesco Cutugno, Renata Savy, Valentina Caniparoli, Leandro D'Anna, Ester Paone, Rosa Giordano, Olga Manfrellotti, Massimo Petrillo & Aurelio De Rosa. 2007. Corpora e Lessici dell'Italiano Parlato e Scritto. http://www.clips.unina.it/.

Renwick, Margaret E. L. & D. Ladd. 2016. Phonetic Distinctiveness vs. Lexical Contrastiveness in Non-Robust Phonemic Contrasts. *Laboratory Phonology: Journal of the Association for Laboratory Phonology* 7(1). 1–29. doi:10.5334/labphon.17.