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Consonant lenition and the stop voicing contrast in Argentine Spanish

Context: Consonant lenition is a synchronic and diachronic sound change in which consonants become "weaker" or more vowel-like in certain contexts, especially between vowels. In Spanish, the voiced stops /b d g/ participate in a synchronic lenition pattern in which the full stop allophones alternate with a continuant variant (e.g., [1], [3], [4]). The specific realization of this alternation varies between dialects of Spanish, with some showing extreme lenition and others showing stop allophones even intervocalically. Furthermore, there is some evidence that place of articulation of the voiced stops could affect degree of lenition ([4]). A smaller body of work has shown that, in some varieties, the voiceless stops also sometimes weaken, coming to be realized as continuants and/or voiced (e.g., [3]), that is, more like voiced stops. Given the variability in how Spanish dialects lenite the voiced stops and given that some varieties of Spanish have been shown to weaken the voiceless stops too, this raises the question of how different dialects of Spanish realize the stop voicing contrast. To date, only a handful of studies have explored lenition of both the voiced and voiceless stops together (e.g., [3]**)**. The current study explores this issue for a particular variety of Spanish: Argentine Spanish.

Research questions:
1) How is the stop voicing contrast of Argentine Spanish realized in intervocalic position?
2) Does place of articulation influence which acoustic cues are used to produce the contrast?

Methodology: 467 Spanish words spoken aloud by Argentine Spanish speakers (12 females, 11 males, ranging in age from 19 to 58, median 31) were extracted from the Romance Phonetics Database ([2]). Target words contained voiced or voiceless intervocalic stops in the onset of an unstressed syllable.

Analysis & findings: Two acoustic measures were taken using Praat: the percentage of the stop interval containing glottal pulses (%-voicing) and intensity of the stops relative to the following vowel (relative intensity). Voiced stops are predicted to have higher %-voicing and higher relative intensity (i.e. closer to the following vowel). Furthermore, the more lenited the stop, the higher these two measures will be. A logistic mixed-effects model found that stop voicing was strongly predicted by both relative intensity ($\beta = -31.1$, $p < 0.001$) and %-voicing ($\beta = -12.3$, $p < 0.001$), with no significant interaction with place. These finding suggest 1) that the stop voicing contrast is realized by both relative intensity and %-voicing, with relative intensity being the stronger cue, at least in production, and 2) that the way the stop voicing contrast in Argentine Spanish is realized does not depend on place of articulation.

Contribution: This study contributes to our understanding of lenition processes and contrast maintenance in varieties of Spanish by illustrating how the stop voicing contrast is realized in one particular variety. Future work should explore other varieties and should determine if the acoustic cues found in production align with those used in perception.

References

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[4] Ortega-Llebaria, M. (2004). Interplay between phonetic and inventory constraints in the degree of spirantization of voiced stops: Comparing intervocalic /b/ and intervocalic /g/. Laboratory Approaches to Spanish Phonology. Berlin: Mouton de Gruyter, 237-255.