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Speech aerodynamics at word junctures: Resyllabification in US heritage Spanish

Ander Beristain
Saint Louis University, ander.beristain@slu.edu

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Introduction. In Spanish phonology, word-final consonants followed by a vowel-initial word are assumed to become 'derived' onsets, as a part of a resyllabification process (Hualde, 2014), e.g., *el amigo* /el. a.mi.go/ 'the friend' is [e.l#a.mi.ɣo] in connected speech. This process is thought to be complete in Spanish, yet Bradley et al. (2022) and Hualde & Prieto (2014) have suggested otherwise, providing several acoustic differences between canonical and derived onsets. Notably, most studies have applied acoustic approaches and focused solely on the resyllabified consonants, which were mainly oral segments. Thus, articulatory approaches investigating the nature of other segments such as nasal structures in connected speech have been overlooked in research, let alone in the context of heritage Spanish bilinguals, who could exhibit onset repair strategies typical of English such as glottal phonation (Repiso Puigdelliura, 2021).

Research Question and Hypothesis: Is there complete resyllabification in the aerodynamic properties of vowels and consonants in US heritage Spanish? Or do they exhibit English-like strategies? The resyllabification hypothesis predicts that airflow contours would be uniform across CV.NV# and CV.N#V sequences.

Methods. 16 heritage speakers of US Spanish (2nd generation bilinguals) participated in a read-aloud task in Spanish. Nasal airflow data were extracted using a pressure transducer connected to a vented mask with a nasal cavity. Each participant produced 40 target tokens under four conditions: $CV_1.CV_2$ (oral control), $CV_1N\#$ (nasalized V, tautosyllabic N), $CV_1.NV_2\#$ (nasalized V, heterosyllabic N), and $CV_1.N\#V_2$ (nasalized V, resyllabified N). Ten time-normalized points were extracted from each V and N segment to observe nasal airflow patterns across time. Thus, 16,000 datapoints were submitted to the statistical analysis which utilized Generalized Additive Mixed Models (GAMM) in *R*.

Results and Implications. The GAMM analysis exhibited no differences between word internal ($CV_1N\#$, $CV_1.NV_2\#$) or juncture ($CV_1.N\#V_2$) contexts in terms of nasal airflow contours in V_1-N-V_2 nasal sequences (see *Figure 1*). This suggests that gestural timing of nasality happens uniformly in canonical and derived onsets, as well as the preceding and proceeding vowels in connected speech, providing evidence for complete resyllabification in articulatory settings in Spanish.

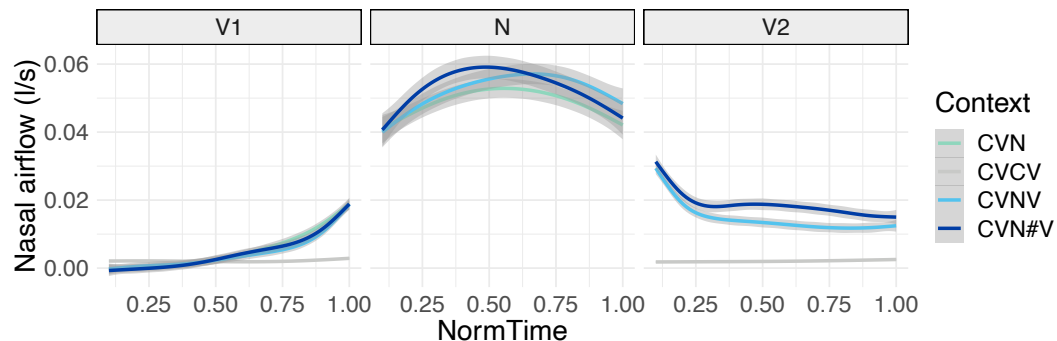**Keywords:** resyllabification, coarticulatory nasalization, aerodynamics, heritage Spanish

Figure 1. Nasal airflow contours across segments