Towards an automatized classification of /s/-allophones in Guayaquil Spanish

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In this contribution I present results of an initial study that aimed to generate a way of automatized classification of retained and weakened /s/-allophones by finding a correspondence between their acoustic parameters and the qualitative type of the realization. The dataset used for the research comes from CHARG (Corpus de Habla Radiofónica de Guayaquil). CHARG is a newly-created corpus of radiophonic speech in the city of Guayaquil, Ecuador. It is the first such a database for this variety of Spanish. CHARG is composed of fragments of radio programs from eight popular local radio stations. Their time of transmission was calculated proportionally to obtain a representation of Guayaquil's radiophonic universe.

The dataset used for this study consists of 3 hours and 11 minutes of informative programs. 30 speakers are included. I recorded the programs using Foobar2000. Then, I transcribed orthographically (SAMPA) the utterances pronounced by the speakers using Annotation Pro software (Klessa et al., 2013) and segmented them using Praat (Boersma & Weenink, 2017) and EasyAlign (Goldman, 2011). Each segment containing /s/ in coda position was delimited manually following strict rules.

S-weakening is a widely described phenomenon in Hispanic linguistics (e.g. Lipski, 1996). As for articulation, /s/-weakening (or aspiration, as it is traditionally called in Hispanic linguistics) is an example of debuccalization, meaning that its place of articulation moves backwards from alveolar to laryngeal to reduce articulatory effort and in pursuit of an open syllable (Marrero, 1990). In simplified terms, this articulatory process results in production of /h/ or in complete /s/ dropping. The process has been proved to be conditioned also by external, sociolinguistic factors (e.g. Moreno Fernández, 1996-97).

In the present research, the parameters considered for the acoustic description of the fricative consonant in question are duration (DUR), center of gravity (COG) and percentage of voicelessness (UNVOI), since they are reported to indicate the lenition of the phoneme (File-Muriel & Brown, 2011). To perform the task, I retrieved the acoustic parameters' values in Praat. Consequently, I excerpted randomly 30% of the tokens and classified them perceptually as either retained or weakened. Statistical analysis revealed weak, despite significant, correlation between the parameters, but a satisfactory correlation between DUR/COG/UNVOI and the results of the perceptual assessment of the fricatives. The analysis is an initial step of elaborating a trained algorithm for classifying the consonants into discrete categories based on objective acoustic measures carried out on big datasets of non-laboratory speech samples.

The present study is a part of a broader research that aims to examine linguistic and non-linguistic factors that motivate the /s/-weakening in Spanish.

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