

Second dialect production of Ecuadorian assibilated rhotics: an acoustic study
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The purpose of the present study is to examine the production of Ecuadorian assibilated rhotics (e.g., [ř] <ramo>-[řa.mo] 'bouquete') by Andalusian Spanish speakers (Spain) who belong to a non-assibilated rhotic Spanish variety. The study has two aims: (1) to determine whether equivalence classification (e.g., Flege, 1995) operates in the same way in second dialect (D2) phonological speech learning in comparison with second language speech learning; and (2) whether knowledge of the target words affects D2 production. Flege's Speech Learning Model (1995) predicts that the smaller the acoustic-phonetic distance between the L1 and the target language sounds, the higher the possibility of equivalence classification (mapping the target-language sound onto the L1 sound). That is, whereas 'new' sounds will be easily acquired, 'similar' sounds will be difficult to acquire. Although Ecuadorian Spanish is characterized by assibilated/fricative rhotics (e.g., Lipski, 1994), Andalusian Spanish is mainly characterized by a trill and a tap (e.g., Blecua, 2001). Moreover, it includes sibilants such as [ʃ] as an allophonic variant of the affricates such as [tʃ] (e.g., Carbonero, 2001). Based on Flege (1995), similar to English speakers (See Rafat, 2015), assibilated rhotics will be classified as 'similar' sounds and produced as a [ʃ] or other sibilants. Moreover, based on Rafat (2015), knowledge of words will lead to a higher rate of rhotic production.

25 adult Andalusian speakers were asked to do two imitation/repetition task. The participants were tested with real words (30), nonce words (30) and fillers (30) at two different times. The stimuli for the imitation task were recorded by a male speaker of Ecuadorian Spanish. The results were analyzed both auditorily and acoustically in PRAAT. The preliminary results showed that two different patterns of production emerged in the two tasks. The two tasks significantly differed in the rate of rhotic ($p=0.000$) and sibilant ($p=0.000$) production. Whereas the real word-based task mainly resulted in rhotic production (72.85%), including 13.67% assibilated rhotic production, the nonce word-based task yeilded 51.85% sibilant production. Theses results mirror the two divergent patterns reported in the auditory and auditory-orthographic conditions reported for naïve English-speaking participants in Rafat (2015).

An acoustic analysis of the data, also suggested that although Flege's SLM may predict the overall patterns of equivalence classification and hence D2 overall production patterns, it does not make adequate predictions about the relative difficulty of the individual phonetic features of the D2 sounds. In addition to examining manner, we measured duration of the rhotic, F2, COG, intensity and relative intensity. However, only duration and F2 were produced in a target-like manner. Previously, manner has been said to be the most salient feature (Steriade, 1999) of rhotics (Ohala & Kawasaki, 1984). Manner was also the most acquirable feature for the French voiced dorsal fricative [ʁ] in Colantoni and Steele (2007). Moreover, duration has been shown to be a cue that Spanish L2 learners rely on when identifying new L2 vowels (e.g., Bohn, 1995; Cebrian, 2006; Escudero, 2001). Escudero (2001) found that while Scottish-English speaking learners of Southern English had native-like perception of the Southern British English /i-I/ contrast, Spanish-speaking learners used duration to identify these L2 vowels. Therefore, reliance on duration is a language-specific cue-reliance tendency in Spanish. With respect to our F2 results, we note that both F2 and COG correlate with place of articulation. However, it is not clear why only the F2 values correlated with those of the Ecuadorian speaker's.

This is a controlled study that makes new contributions to our understanding of D2 speech learning. First, it shows a very robust similarity to L2 production patterns at the very beginning stages of D2 acquisition. Second it shows that knowledge of words similar to knowledge of orthographic information in L2 can modulate equivalence classification in D2 acquisition. Finally, it shows that some of the cue-reliance tendencies previously reported also hold true for Spanish D2 learners.

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