

The effect of short-term study abroad on the phonetic production of Spanish allophonic /d/ variation by L2 Spanish and Spanish Heritage speakers

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Historically there have been few studies analyzing the effect of study abroad on the acquisition of L2 phonological production (Sanz & Morales-Front 2018). However, the last decade has seen an increase in studies analyzing the acquisition of L2 phonemes (Detrixhe 2015; George 2014; Knouse 2012; Ringer-Hilfinger 2012) and L2 allophonic variation (Bongiovanni et al. 2015; Díaz-Campos 2004; Lord 2010). Bongiovanni et al., the only previous acoustic analysis, found that a short-term study abroad improves L2 Spanish allophonic /d/ production. /d/ presents allophonic variation between occlusive [d] and approximant [ð] in Spanish, but only [d] in English (Hualde 2005). These results notwithstanding, there is still a lack of study abroad studies of L2 allophonic variation and even fewer studies comparing different language levels. To address these gaps, the study analyzed Spanish L2 allophonic /d/ variation with the novel component of comparing different language levels, including Heritage speakers.

The aims of the study were two-fold: (i) to examine the effect of short-term study abroad in the production of Spanish allophonic variation (/d/ spirantization between [d] and [ð]); (ii) to compare allophonic acquisition by language level of L1 English speakers (L2-intermediate, L2-advanced, Spanish Heritage speakers). 40 undergraduate students (9 men, 31 women; ages 19-22 (*M*: 20.45; *SD*: 0.99)) from a public southwest American university participated in a reading task at the start and end of a 5-week study abroad program in Sevilla, Spain. 42 past participle /ado/ tokens (i.e. *cansado*) were included in the study, hence controlling for syllabic stress and phonological context. There were also 92 distractors, resulting in a total of 134 sentences per session. All words were presented in a carrier phrase in randomized order. Between the two sessions there were 3,284 tokens included in the final analysis. From a usage-based (Bybee 2001) and exemplar theory (Pierrehumbert 2001) framework, /ado/ provides an ideal context to examine the acquisition of subtle allophonic variation as it is a highly frequent pattern with many exemplars in the immersion context. Additionally, Andalusian Spanish makes this context even more salient as intervocalic /d/ is routinely lenited (Villena Ponsoda 2008). The dependent measure, measured in Praat (Boersma & Weenink 2017), was the difference in intensity (dB) between maximum intensity of the following vowel and minimum intensity of /d/ (Hualde et al. 2011). Independent variables included: time (Time 1, Time 2), language group (L2-intermediate, L2-advanced, Heritage), and hours of Spanish spoken outside of class, with random factors of word and speaker.

A mixed effects linear regression in R (R Team 2017) using the *lmer* function (Bates et al. 2015) found a main effect for time and an interaction between time and language group (Figure 1). One L2-advanced speaker (T1 *M*: 10.8; T2 *M*: 1.8) also demonstrated metalinguistic awareness of the complete elision (Figure 2). The results indicate that only L2-advanced and Heritage speakers produced more approximant-like allophones after 5 weeks. Implications are two-fold: (i) a usage-based and exemplar theory approach indicates that even in a short period of time, highly frequent input can improve the acquisition of L2 allophonic variation in a study abroad context, although language level may affect one's ability to acquire these subtle differences; (ii) theoretical L2 speech learning models should incorporate language level differences and usage-based/exemplar model accounts into explanations of L2 phonological acquisition.

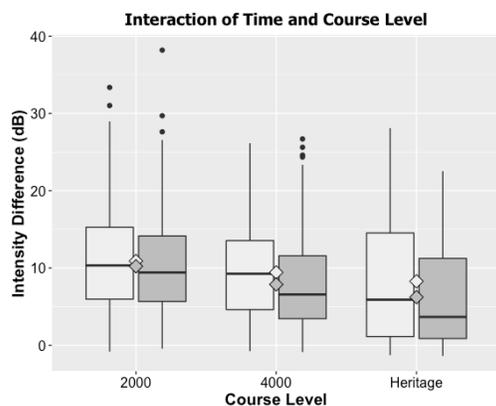


Figure 1

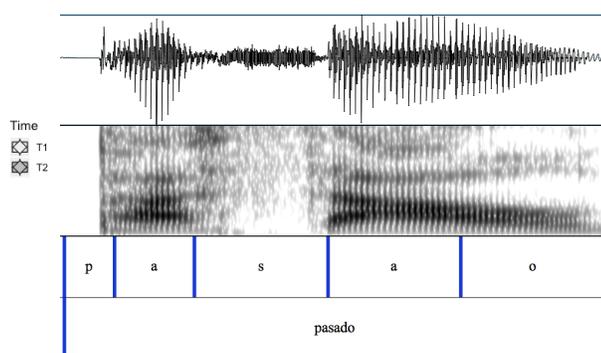


Figure 2

Figure 1: Boxplots of interactions by group and time for intensity difference (dB)

Figure 2: Spectrogram of *pasado* with total elision [Ø] for /d/ by L2-advanced speaker produced during a post-reading open-ended question describing what she had learned in Sevilla

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