Exploring perceptual development of L2 phonological contrasts during a study abroad program

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The impact of Study Abroad (SA) on various L2 skills has been widely studied (see Borràs & Llanes, 2021, for a review); however, its effect on L2 phonological development, particularly in terms of perception performance, has received relatively little attention. This study aims to investigate how SA influences the perception of Spanish stop contrasts and lexical stress among Mandarin-speaking learners. When categorizing Spanish stop contrasts (voiceless vs. voiced), native speakers typically show a perceptual boundary around –2ms in the voice onset time (VOT) (Schertz et al., 2020). In contrast, Chinese students' boundary is located at VOT = 23ms, which is similar to the categorization boundary for Mandarin aspirated and unaspirated stop contrasts (Liu et al., 2019). Concerning Spanish lexical stress, Chinese students tend to produce the contrast by relying on pitch manipulation, unlike Spanish natives (Li & Xi, 2022). However, the perceptual patterns related to lexical stress remain unknown. This study examines L2 perception of these two phonological aspects, with a particular focus on determining whether a SA experience can help L2 learners approximate the perceptual strategies employed by native speakers.

The perception data were obtained from 30 Mandarin-speaking intermediate learners of Spanish, while reference data were collected from 19 native Castilian Spanish speakers. The participants completed two tasks: a VOT perception task and a stress perception task. The Chinese students took the tasks twice, once upon their arrival and again at the end of SA (approximately 8 months later). The Spanish natives participated only once. In the VOT perception task, participants identified stop sounds in three continua (/b/-/p/, /d/-/t/, and /g/-/k/), where the VOT ranged from –60ms to 60ms in 13 steps. The stress perception task involved identifying the first- or third-person conjugation of a sentence-final verb, which contrasted only in lexical stress (paso 'I pass' vs. pasó 'she/he passed'). To create trochaic or iambic lexical stress patterns, the pitch and duration ratios of the target verb's syllables were manipulated (7 steps each). Each stimulus in the two perception tasks was repeated four times to ensure reliability.

Results from the VOT perception task (Figure 1) revealed significant differences in the categorization of Spanish stop contrasts between Spanish natives and Chinese students, both before and after SA. Spanish natives had a categorization boundary for voiced and voiceless stops at 0ms, whereas Chinese students' boundary significantly differed, being at 17ms before SA and 15ms after SA. Although students showed a slight improvement, it did not reach statistical significance.

Regarding the stress perception task (Figure 2), Spanish natives relied more on duration than pitch when judging lexical stress placement. In contrast, Chinese students relied more on pitch than duration, both before and after SA. Remarkably, students' reliance on pitch increased significantly after SA.

These findings suggest that intermediate L2 learners displayed distinct perceptual patterns in stop contrasts and lexical stress compared to native speakers. Furthermore, the 8-month SA experience may be insufficient to help establish L2 phonological categories, both at the segmental and prosodic levels. Despite participants in our study self-reporting that L2 Spanish constitutes approximately 40% of their daily communication, the exposure to the target language seems insufficient to alter their perceptual strategies over an 8-month period. Previous research has showed that a 3-week SA program, accompanied with training on L2 Spanish lexical stress, effectively enhances learners' stress perception (Romanelli et al., 2015). Therefore, to achieve successful perceptual learning of L2 phonological features, explicit instruction during an SA program may be more crucial than merely extending the duration of the SA experience.

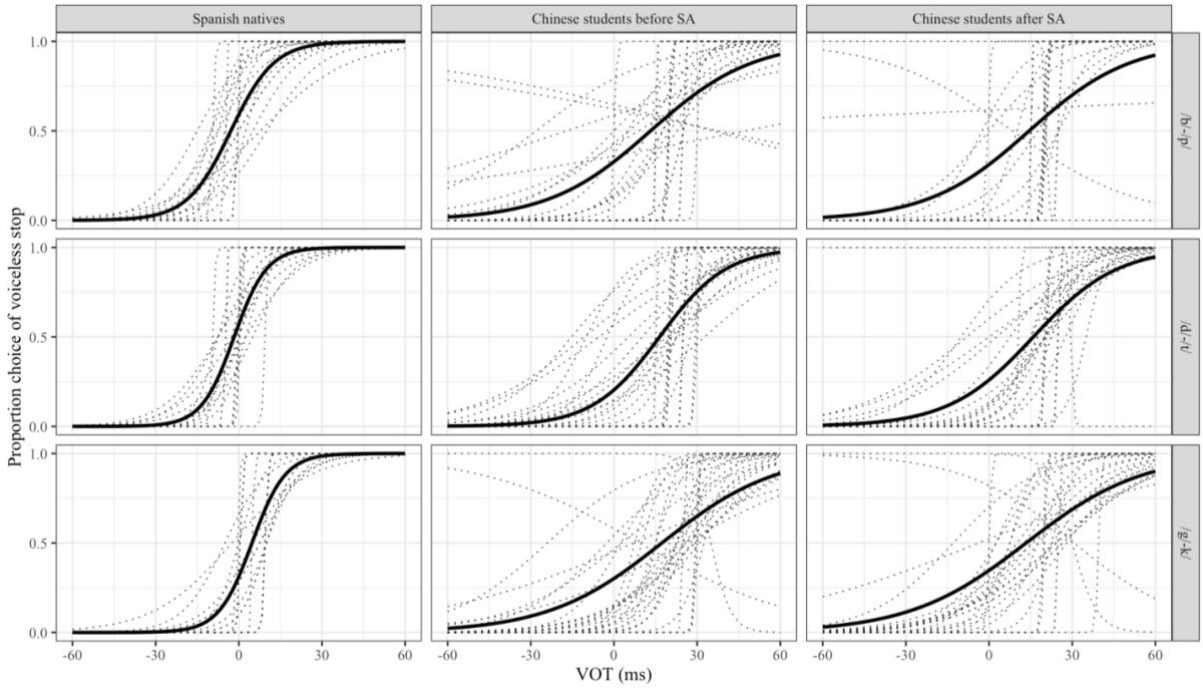

Fig. 1. Performance for categorization of stops on VOT continua.

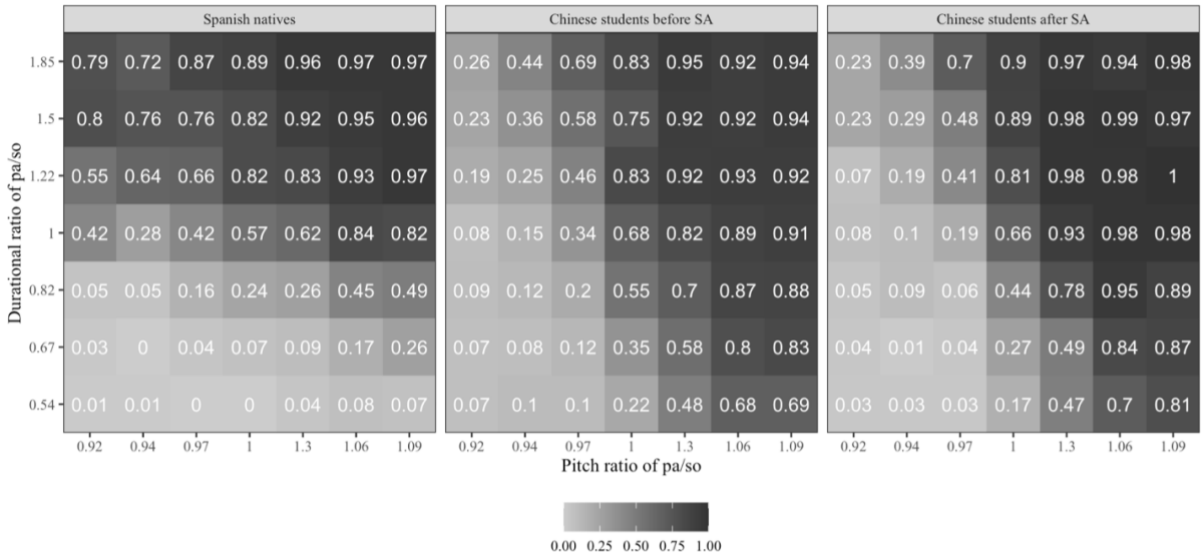

Fig. 2. Proportion of choosing the trochaic lexical pattern "paso" when the stimuli varied by pitch and durational ratio.

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