

Spanish Speakers' Accuracy in Distinguishing English Phonemic Contrasts

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Introduction

Background:

- Native Spanish speakers who learn to speak English must learn to map letters onto sounds that do not exist in their native language (Raynolds, Uhry, and Brunner, 2012).
- Spanish has five graphemes that represent its five vowels, whereas English has 14 vowels. Perceptual difficulties are caused by the lack of representation of certain English vowel sounds by Spanish speakers (Raynolds, Uhry, and Brunner, 2012).
- Short vowel sounds in English are non-existent in Spanish and may be assimilated on to the available Spanish phonemes. In addition to vowels, there are English consonants (e.g. /v/) and digraph sounds that are allophonic in Spanish, making them difficult for Spanish late monolinguals and bilinguals to distinguish (Honig, Diamond, Gutlohn, & CORE 2008; Cardenas-Hagan 2011; Bear et al., 2003).
- When Spanish speakers learn to read and write in English, they need to create new grapheme-phoneme relations. These letter-sound relations may help them perceive English phonemes that are not distinguishable in Spanish.

Research Question 1:

Do Spanish speakers have the same accuracy as English speakers for phonemic pairs that are contrastive in English but allophonic in Spanish?

Hypothesis:

We hypothesize that native English speakers will have better accuracy in distinguishing phonemic pairs than native Spanish speakers because English speakers have experience distinguishing these contrasts in their language while Spanish speakers have more limited experience.

Research Question 2:

Does orthography enhance listeners' ability to distinguish the contrasts?

Hypothesis:

We hypothesize that orthography will enhance listeners' ability to distinguish the phonemic contrasts because Spanish speakers may learn to associate graphemes with newly learned English phonemes.

Methods

Participants:

- 19 native speakers of English, aged 18-36 (mean = 26.1)
- 15 native speakers of Spanish, aged 21-45 (mean = 33.1), who acquired English between age 7-29

Stimuli:

- Four experimental phonemic contrasts were placed in different word positions within CVCVC pseudo-word minimal pairs with two control pairs created for each experimental pair, resulting in a total of 60 pseudo-word pairs.

Examples		
Four Experimental Contrasts	Control 1	Control 2
1. /v/ - /b/: /'vɛsɪt/ - /'bɛsɪt/	1. /'vɛsɪt/ - /'zɛsɪt/	1. /'bɛsɪt/ - /'dɛsɪt/
2. /ð/ - /d/: /'ðæsəl/ - /'dæsəl/	2. /'ðæsəl/ - /'væsəl/	2. /'dæsəl/ - /'bæsəl/
3. /ɪ/ - /i/: /'pɪmɪk/ - /'pimɪk/	3. /'pɪmɪk/ - /'pamɪk/	3. /'pimɪk/ - /'peɪmɪk/
4. /ʌ/ - /a/: /'bʌnɪf/ - /'bʌnɪf/	4. /'bʌnɪf/ - /'beɪnɪf/	4. /'bʌnɪf/ - /'bɒnɪf/

Task:

- Participants completed a computer experimental task in which they heard three stimuli in succession and had to match the target word (in the middle) with the first or last stimulus.
- The stimuli were presented randomly and divided evenly into two blocks. The first block was auditory only, and the second block also included orthography for the target stimulus.

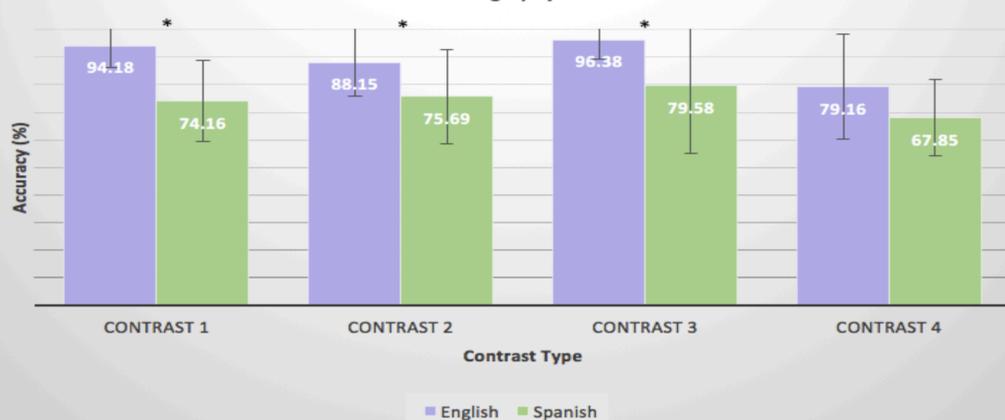
Materials and Analysis:

- Stimuli were presented on a laptop using PsychoPy presentation software.
- For **RQ1**, Independent Samples t-tests were conducted in order to compare Spanish and English speakers for each of the experimental contrasts.
- For **RQ2**, Paired samples t-tests were conducted in order to compare block 1 and block 2 stimuli within the native Spanish-speaking group.

Results

RQ 1

Accuracy for Both Groups No Orthography Block

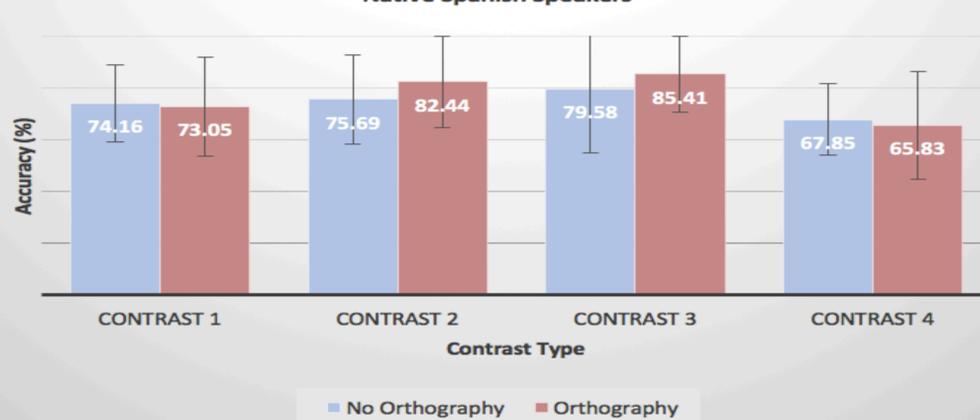


Independent Samples t-test

	Contrast 1 /v/ - /b/	Contrast 2 /ð/ - /d/	Contrast 3 /ɪ/ - /i/	Contrast 4 /ʌ/ - /a/
p - value	<.001	.019	.008	.072

RQ 2

Accuracy for Block 1 vs Block 2 Native Spanish Speakers



Paired Samples t-test

	Contrast 1 /v/ - /b/	Contrast 2 /ð/ - /d/	Contrast 3 /ɪ/ - /i/	Contrast 4 /ʌ/ - /a/
p - value	.810	.876	.253	.696

Conclusions

RQ1: Native Spanish speakers had lower accuracy than English speakers for all four contrasts in block one. This difference was significant for 3 out of the 4 contrasts. This suggests that English speakers are better able to distinguish phonemic pairs that are contrastive in English compared to Spanish speakers.

RQ2: Spanish speakers' accuracy did not improve in the second block when orthography was also presented. This suggests that orthography did not aid participants' ability to distinguish the contrasts.

References

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