Distinguishing Allophones: The Role of English Proficiency and Decoding Skills for Native Spanish Speakers

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Background

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- 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 in Spanish. For example, there is only one short /o/ sound in Spanish, whereas the English language has three variations (Raynolds, Uhry, and Brunner, 2012).
- Short vowel sounds in English are non-existent in Spanish and may be assimilated on to the closest available Spanish phonemes. In addition to vowels, there are English consonant (/v/) and digraph sounds that are allophonic in Spanish, making them difficult for bilinguals to distinguish (Honig, Diamond, Gutlohn, & CORE (2008); Cardenas-Hagan (2011); Bear et al., 2003).
- Unlike Spanish, English lacks transparency, meaning that letters correspond to multiple sounds, and sounds may correspond to multiple letters. This is unlike Spanish, which is relatively transparent. In Spanish, letters typically match to one sound, making decoding much easier in Spanish than in English.

Purpose and Hypotheses

- The purpose of this study was to investigate whether grapheme-phoneme knowledge and/or English proficiency support native Spanish speakers in distinguishing sounds that are contrastive in English but allophonic in Spanish.
- We hypothesize that better English proficiency and better decoding skills will predict better accuracy in participants' ability to distinguish the stimuli.

Methods

Subjects

- 15 native speakers of Spanish aged 21-45 (mean age = 33.1, acquired English between ages 7-29)

Stimuli

- Four experimental contrasts were tested (/v/-/b/, /ð/-/d/, /ɪ/-/i/ and /ʌ/-/a/) within CVCVC pseudo-word minimal pairs, with two control pairs created for each experimental pair, resulting in a total of 60 pseudo-word pairs.

Example stimuli with /v/-/b/ contrast

Experimental	Control 1	Control 2
vessit-bessit	vessit-zessit	bessit-dessit

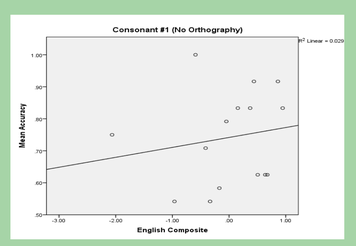
- The stimuli were presented in two blocks. The first block included only auditory presentation and the second block also included orthography for the target stimulus. Half of the pairs were presented in the first block, in random order, and the other half in the second block.
- An AXB paradigm was used in which participants heard 3 pseudo-words in succession and had to match the target pseudo-word (in the middle) with the first or last pseudo-word.

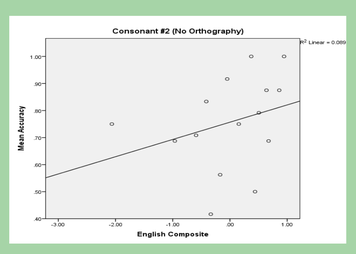
Materials & Analysis

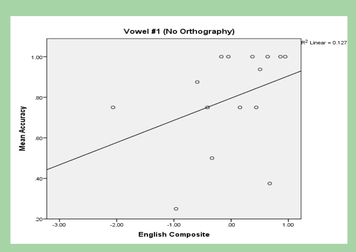
- English proficiency was measured using the Can-Do Questionnaire, Vocabulary Level Test, and Self-Rating of English skills. Decoding ability was measured using the Word Detective assessment. The Can-Do Questionnaire is a self-rating of functional language scenarios consisting of Spanish and English abilities.
- A composite English proficiency score was calculated by averaging each participant's performance on the Can-Do Questionnaire, Vocabulary Level Test, and mean Self-Rating of English skills.
- Stimuli were presented on a laptop using PsychoPy presentation software
- Linear regressions were conducted with English proficiency and decoding ability as predictor variables and accuracy distinguishing the English contrasts as the outcome variables. Regressions were conducted separately for each block because English proficiency and decoding skills may have different effects depending on whether orthography was presented or not.

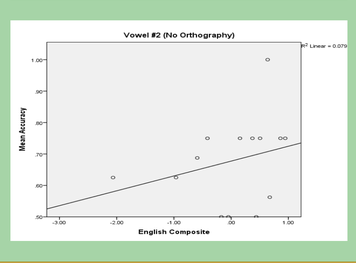
Results

English Proficiency No Orthography Block

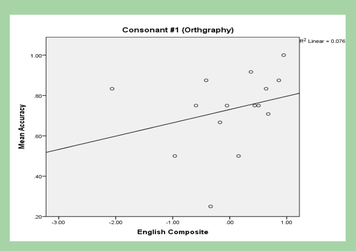


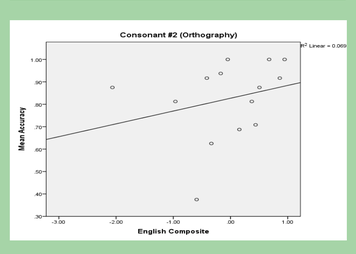


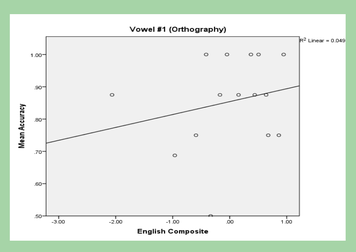


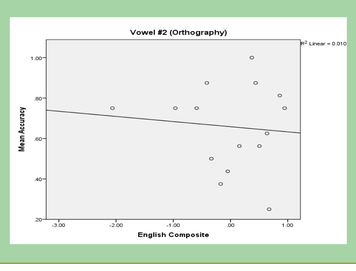


English Proficiency Orthography Block

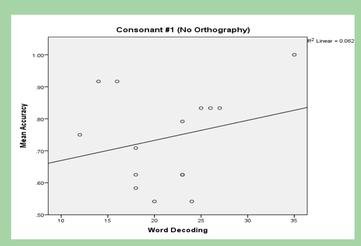


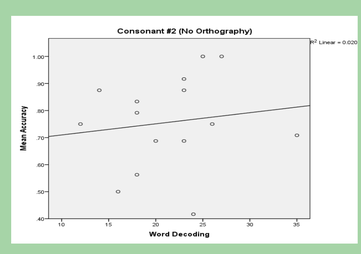


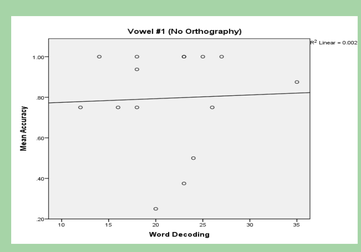


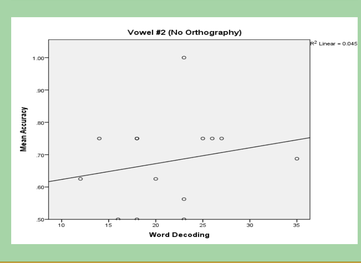


Word Detective No Orthography Block

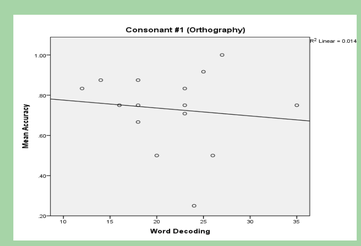


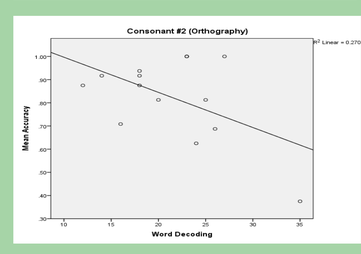


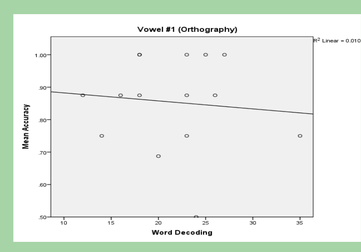


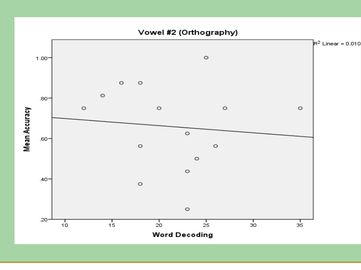


Word Detective Orthography Block









Pearson Correlations

Condition	English Proficiency	Decoding Skills
Consonant 1 No Orthography	.169	.248
Consonant 2 No Orthography	.298	.140
Vowel 1 No Orthography	.356	.043
Vowel 2 No Orthography	.282	.212
Consonant 1 Orthography	.276	-.120
Consonant 2 Orthography	.263	-.519
Vowel 1 Orthography	.221	-.099
Vowel 2 Orthography	-.098	-.098

Summary & Conclusions

- **English proficiency showed moderate positive correlations** with accuracy in distinguishing English contrastive phonemes. None of these correlations were statistically significant, however. This findings suggests that the higher one's English proficiency is, the better they are able to distinguish English phonemic contrasts. Our power to detect significant statistical correlations may be due to our small number of participants.
- Participants' **decoding skills** and accuracy on the experimental contrasts are **not significantly correlated**. Some of the correlations were positive and some were negative, though no consistent pattern emerged.
- This analysis is based on a subset of the total number of participants; thus, results are subject to change, as we are still collecting data to detect any relationships that may exist between English proficiency, word decoding abilities, and non-native phoneme discrimination.

References & Acknowledgments

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