Packet of abstracts for CASPStP 2012
(main and poster sessions integrated; ordered by last name of first author);

Portuguese nasal vowels: Native and non-native acoustic realizations
Ann Bailey, Florida State University

Although it is a well-known fact that Portuguese has a phonemic contrast between oral and nasal vowels, few acoustic studies examine the differences between them. Some of these studies include Gigliotti de Sousa (1994), who investigates nasal and oral monophthongs in 3 male speakers of southern Brazil; Seara (2000), which focuses on the acoustic-perceptual factors of nasality in the same area; and Moraes et al. (2002) acoustic description of oral vowels from various regions of Brazil.

The present study contributes to the investigation of vowels in Portuguese with an acoustic study of oral and nasal vowels in several speakers from the northwest, southeast, and south of Brazil. In addition, it examines the acoustic realization of oral and nasal vowels in native speakers of Spanish learning Portuguese as a second language, on which there are no previous studies. The main objectives are (i) to compare articulatory differences between oral and nasal vowels, such as height, advancement, and duration and (ii) to examine whether L2 Portuguese speakers are able to contrast between oral and nasal vowels in Portuguese.

The experimental design involved 24 tokens with oral and nasal monophthongs and diphthongs in Portuguese. Tokens were disyllabic and trisyllabic words with the target vowel in the tonic syllable (Table 1). Two tasks were used: a series of naturalistic sentences, and carrier sentences with the structure ‘diga...também’ (‘say...as well’), which were repeated. This gave a total of 96 tokens per speaker. L1 Spanish speakers also participated in a third task, which included Spanish words in a naturalistic paragraph. This allowed the comparison of their Spanish and Portuguese vowels.

Data was obtained using an Olympus LS-11 recorder in a laboratory setting. Acoustic analysis was performed via waveforms, spectra and spectrograms in Praat to measure the following dependent variables: (i) vowel duration, (ii) values of F1 and F2; (iii) presence and duration of nasal murmur (the consonant-like phase of nasal vowels), and (iv) presence and frequencies of anti-resonances. Independent variables were native language, second (and/or third) language, sex, regional dialect, vowel class (mid, low, high), nasal/oral quality, monophthongs/diphthongs, and context after target vowel (nasal consonant or stop).

A pilot study with one native Brazilian speaker from Amazonas and two L1 Spanish speakers from Argentina and Spain revealed several trends in the production of nasal vowels. Most F1 and F2 values for the native speaker’s nasal vowels corresponded to the average values given in Gigliotti de Sousa (1994), but this was not the case for his oral vowels. The data showed nasal murmurs with an average duration of 31 ms in nasal monophthongs when followed by a nasal consonant and a stop (/l d/) for the native speaker, which was shorter than the non-native speakers’ average of 83 ms. For nasal diphthongs, the native speaker did not show nasal murmur, unlike L1 Spanish speakers. Anti-resonances were present in the spectra of all nasal monophthongs for all participants, but at lower frequencies in the native speaker. For the L1 Spanish speakers, a contrast in duration between oral and nasal vowels was found, which corroborates Gigliotti de Sousa’s (1994) findings on oral and nasal vowel duration; however, the Brazilian speaker did not consistently make this contrast.

Results from 6 additional subjects (3 L1 Portuguese speakers, 3 L1 Spanish) will be discussed. It is expected that the results obtained in the pilot project will be confirmed. Implications for second language learners and pedagogy will also be discussed.
### Table 1: Tokens

<table>
<thead>
<tr>
<th>Oral monophthongs</th>
<th>Transcription</th>
<th>Orthography/Translation</th>
<th>Nasal monophthongs</th>
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<tbody>
<tr>
<td>‘fado’ (genre of music)</td>
<td>[fɐ.ˈdo]</td>
<td>‘santo’ (holy, sacred)</td>
<td>[ˈsɐ̃.tɔ]</td>
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<tr>
<td>‘vejo’ (I see)</td>
<td>[ve.ˈʒo]</td>
<td>‘vento’ (wind)</td>
<td>[ˈvɛ.ʒo]</td>
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<td>‘veto’ (veto)</td>
<td>[vɛ.ˈto]</td>
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<tr>
<td>‘fica’ (he/she stays)</td>
<td>[fi.ˈka]</td>
<td>‘vindo’ (I come)</td>
<td>[ˈvi.ˈdu]</td>
</tr>
<tr>
<td>‘fofo’ (cuddly)</td>
<td>[fo.ˈfo]</td>
<td>‘fonte’ (fountain, source)</td>
<td>[ˈfɔ.ˈfɨ]</td>
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<tr>
<td>‘fora’ (out, outside)</td>
<td>[fo.ˈɾa]</td>
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<tr>
<td>‘fuga’ (escape)</td>
<td>[ˈfu.ɡa]</td>
<td>‘fundo’ (bottom, deep)</td>
<td>[ˈfu.ˈdu]</td>
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</table>

<table>
<thead>
<tr>
<th>Oral diphthongs</th>
<th>Transcription</th>
<th>Orthography/Translation</th>
<th>Nasal diphthongs</th>
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</thead>
<tbody>
<tr>
<td>‘capitais’ (capitals)</td>
<td>[ka.piˈtajs]/[ka.piˈtaj]</td>
<td>‘capitães’ (captains)</td>
<td>[ka.pi.ˈtɐʃ]/[ka.pi.ˈtɐj]</td>
</tr>
<tr>
<td>‘selva’ (sapid)</td>
<td>[ˈsɛ.j.ˈva]</td>
<td>‘formação’ (education)</td>
<td>[ʃor.ma.ˈsɛw]</td>
</tr>
<tr>
<td>‘(a)s oito’ (eight)</td>
<td>[a.ˈʃi.ˈɾi]</td>
<td>‘percepções’ (perceptions)</td>
<td>[pɛɾ.sep.ˈʃiʃ]/[pɛɾ.sep.ˈʃiʃ]</td>
</tr>
<tr>
<td>‘suite’ (suite, room)</td>
<td>[ˈʃu.ʃi.tʃ]</td>
<td>‘muita’ (many)</td>
<td>[ˈmu.ʃi.tʃ]</td>
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<tr>
<th>Triphongs</th>
<th>Phonetic Transcription</th>
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<tbody>
<tr>
<td>‘policia’ (police)</td>
<td>[po.li.ˈʃi.ɾa]</td>
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**Monophthongs: oral and nasalized contexts (Spanish)**

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<th>Transcription</th>
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<tbody>
<tr>
<td>‘faro’ (lighthouse)</td>
<td>[ˈfa.ɾo]</td>
<td>‘panda’ (panda)</td>
<td>[ˈpa.ɾa]</td>
</tr>
<tr>
<td>‘velo’ (veil)</td>
<td>[ˈbe.lo]</td>
<td>‘pento’ (name of panda in task 1)</td>
<td>[ˈpɛnto]</td>
</tr>
<tr>
<td>‘fila’ (line)</td>
<td>[ˈfi.ɾa]</td>
<td>‘pinta’ (pint, he/she paints)</td>
<td>[ˈpi.ɾa]</td>
</tr>
<tr>
<td>‘foro’ (forum)</td>
<td>[fo.ˈɾo]</td>
<td>‘ponto’ (I place/put)</td>
<td>[po.ɾa]</td>
</tr>
<tr>
<td>‘fuga’ (escape)</td>
<td>[ˈfu.ɡa]</td>
<td>‘punta’ (point)</td>
<td>[ˈpu.ɾa]</td>
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</table>

**Selected references**


Degree of lenition as a measure of language transfer in the acquisition of L3 phonology
Stephen Barnes, University of Georgia

Second language acquisition (SLA) has been a field of considerable interest for researchers for the past couple of decades. Out of its relatively recent popularity has emerged an interest in the acquisition of languages learned after the second (i.e., third language or additional languages learned). However, there has been considerable difficulty in developing an accepted definition of what actually constitutes a third language (Klein, 1995; Falk and Bardel, 2010). Wrembel et al. (2010:1) observes that, “the term ‘third language’ is typically used to stress the differences between ‘second’ (L2) and ‘further’ language acquisition and is often used to refer to any language acquired after a ‘second language’ has been learned, however imperfectly.” This definition, however, leads me to the theoretical question: Is there a difference between L3 and a second L2?

The field of third language acquisition (TLA) represents an area of research that is relatively new and unexplored. Even more so is the research on the acquisition of third language phonology. The most recent research that has been conducted has dealt with the investigation of the influence of the native language on the acquisition of the second or third language (Gut, 2010; Wrembel, 2010; Llama et al., 2010; Missaglia, 2010). Despite the “vibrancy of this young discipline” (Wrembel et al., 2010:1) there is a need for a more developed methodology that can better account for and evaluate cross-linguistic influence in TLA. And, we must question what factors play a significant role in the influence between the native language, L2, and L3.

The present study investigates language transfer (i.e., cross-linguistic influence) in the acquisition of L3 phonology. More specifically, the study examines the degree of lenition (i.e., weakening) of voiced stops in intervocalic position in Spanish (L2) and Portuguese (L3). The study analyzes the pronunciation of the voiced stops [b, d, g] in intervocalic position while taking into account vocalic context (a, a) and stress context (á, a, á, a). The aim of the present study is to see whether there is notable language transfer in the acquisition of L3 phonology of American university students who first learned Spanish and are now learning Portuguese.
Leaving the dark to find the light: English light and dark /l/ transfer to L2 Spanish
Ariel Bean, Brigham Young University

Much of the recent research conducted to determine fluency in L2 Spanish on the segmental level has focused on VOT, the spirantization of /b, d, g/, and the acquisition of the Spanish tap /ɾ/ and trill /ɾ/, largely ignoring the acquisition of other consonants and vowels. While the existing research is valuable, the acquisition of Spanish /ɾ/ by native English speakers has been neglected. This merits investigation because both languages have a lateral phoneme /ɾ/ but they are realized with diverging allophony.

Although the Spanish /ɾ/ is generally produced as a light /ɾ/, the English /ɾ/ cannot be described so simply. Largely depending on the context, it is more accurate to say that, particularly in American English, laterals are on a gradient scale of lightness and darkness, depending on the amount of velarization as is evidenced in the F2 height (Yavaş 2006). That is, a higher F2 is indicative of a clearer [ɪ] and a lower F2 is indicative of a darker, more velarized [ɪ] and while both variants are exemplified in English speech, only the light variant is typical of Spanish. Furthermore, Recasens (1996) has found that the dark /ɾ/ exhibits a different F2 and is hardest to perceive in English when followed by the high vowel /i/. Consequently, some listeners to not even produce /ɾ/ but instead replace it with [w]. Yavaş (2006) also describes the postvocalic dark /ɾ/ as similar to /u/ in that the tongue back approaches the velum. Additionally, the American English tendency is to velarize coda-positioned and ambisyllabic /ɾ’s/ (Yavaş 2006; Sproat & Fujimura’s 1993). Consequently, the direct transfer of the English allophones [ɪ] and [ɪ] and the increased resemblance of [ɪ] to /u/ both greatly impact perceived foreign accent and understanding, potentially leading to mistaking a word such as /alto/ for /auto/.

Despite the general lack of information available about American English L1 /ɾ/ phonology and its relationship with L2 acquisition research, Díaz-Campos (2004, 2006) included an analysis of the typically velarized English [ɪ] in Spanish word-final position in study abroad versus at home students based on entrance and exit reading tasks and oral interviews with a 10-week learning period. In his studies, he found that the students did improve overall, but the dark (non-target-like) variant was still favored in 72% of the elicited tokens. As a follow-up on his research, I have also conducted analyses on learner /ɾ/ production, focusing on two questions: (1) Based on formant measurements, to what extent do the dark /ɾ’s/ typical of English syllable codas transfer into L2 Spanish learners’ speech; and (2) Based on samples from a variety of learning stages, are there significant signs of improvement in learners’ speech with course advancement?

The present study examines seven students from three different levels of beginning Spanish university courses, whose results were compared with a native baseline. They participated in a Simulated Oral Proficiency Interview and a reading task, providing more than 1200 tokens in a variety of speech contexts, which were analyzed in Praat with a script measuring the F2 of each /ɾ/. A mixed models analysis was conducted analyzing the gradient nature of /ɾ/ velarization and its relationship with phonetic context, level of instruction, and task type. The results are representative of students at varying beginning levels of acquisition and provide evidence illustrating a general movement toward higher F2 values in lateral production among learners, thereby contributing to our knowledge of L2 acquisition.
REFERENCES


Confusion in the L2 perception of Spanish segments: The role of stress in the (mis)identification of Spanish [t], [ð] and [ɾ] in word-final syllables
Rob Bedinghaus, Indiana University

Research in L2 speech perception has shown that sounds that exist in both the L1 and L2 phonological inventories are not always easily discriminable (Best 1995, Best & Tyler 2007, Feige 1995). Various factors have been shown to play a role in determining how difficult the discrimination and identification of sounds will be for a language learner, including how the L2 sounds assimilate to L1 categories (Best 1995, Feige 1995, Rose 2010) and the status of the sounds in both the L1 and L2 as contrastive or non-contrastive (Boomershine et al 2008). Furthermore, research in L2 Spanish phonology has shown that more experience with the L2 contributes to more native-like discrimination of segments that are similar in the L1 and L2 (Boomershine et al 2008). The segments /t/, /ð/ and /ɾ/ represent phonemic and allophonic differences between English and Spanish. For example, the Spanish allophone [ð] (/ð/) can be misperceived as the English phoneme /ð/, and the Spanish /t/ as English /ð/ (Ladefoged 2001). More importantly for the current study, the Spanish tap phoneme /ɾ/ has been shown to be cross-identified by listeners with the English flap [ɾ], an allophone of /t/ and /ð/ (Monnot & Freeman 1972). It is significant to the current study that an unstressed vowel following /ð/ or /t/ has been described as the critical context influencing the production of the flap allophone (de Jong 1998, Kahn 1980).

The current study examines the perceptual (mis)identification of the aforementioned segments intervocically in the final syllable of tri-syllabic nonce words, when the word-final vowel is stressed and unstressed (i.e., V.CV# vs. V.CV#). It investigates a question left unaddressed by previous studies of these Spanish segments. Do learners apply the phonological context of English flapping to identification of Spanish /ɾ/? In other words, does an unstressed final vowel contribute to more misidentification of [ɾ] as /ð/ than when the final vowel is stressed? Furthermore, how do learners of different course levels compare? Intermediate (200 level), advanced (300 & 400 levels) and graduate-level learners of Spanish (L1 English), as well as a native Spanish speaking control group, completed an identification task in which they listened to 152 non-words recorded by two female native speakers of Northern Peninsular Spanish in a soundproof studio. Using the experiment feature of Praat, participants heard each word and selected from three options the word they heard. The graphemes <d>, <t>, and <ɾ> represented the three phonemes under study (<d>-/ð/, <t>-/t/, <ɾ>-/ɾ/). A few sample target words are pamaro and pamaró. All words were tri-syllabic in order to control for word length. The target words varied in the stress of the word-final vowel, as well as word endings a_o, i_o, and u_o (where the spaces are filled by [t], [ð], and [ɾ]). These word endings were chosen due to being more similar to common word-final sequences in real Spanish words than segments used in previous studies (e.g., i_i, u_u, a_a in Boomershine et al. 2008). [t] [ð] and [ɾ] each appeared in the three intervocalic contexts, both stressed and unstressed final syllables for each word, and for each speaker, totaling 36 target words and 116 distracters that presented different segments in varying positions in the word. A background questionnaire was also administered.

Preliminary results for the intermediate level show that, consistent with previous studies, [ɾ] was significantly more difficult to discriminate than [ð] or [t], and was misperceived as /ð/ 68% of the time. [ð] and [t] were accurately perceived almost categorically as /ð/ and /t/ respectively.
References


The stop-spirant alternation in L2 Spanish: An Optimality Theoretic account
Jennifer Cabrelli Amaro, University of Florida

In an effort to contribute toward the resolution of the debate whether late second-language (L2) learners can acquire a native-like representation of a target language phonological system and to observe the path of L2 phonological development, the present study proposes a Optimality Theoretic account of the acquisition of the stop-spirant alternation in L2 Spanish by native speakers of English, accounting for the variation that is characteristic of late learners of an L2.

The Spanish phonemic inventory contains the underlyingly voiced stops /b d g/, which surface as spirants in postvocalic position. Following the prosodic hierarchy (Nespor & Vogel 1986) that delimits the levels at which a phonological phenomenon applies, Zampini (1997, 1998) determines that the prosodic domain of the alternation is the intonational phrase (a sequence with a single intonational contour), indicating that it also occurs within the prosodic domains below it, including the phonological word (the terminal element of a syntactic tree) and the clitic group (within the boundaries of a phonological word and its clitics) (1-3). Zampini also presents evidence in favor of the Subset Principle (Wexler & Manzini 1987), showing that L2 Spanish learners start with the most restrictive grammar (in this case, at the level of the phonological word) and expand their grammar according to positive evidence. However, as Zampini notes, the corpus of data used was small and further research is necessary to verify her findings. The present study seeks to test the hypothesis that late L2 learners acquire the stop-spirant alternation in stages according to the prosodic hierarchy, analyzing intermediate and advanced learners' productions in terms of interlanguage constraint rankings.

Following Piñeros' (2002) account of the stop-spirant alternation in Optimality Theory adopted from Kirchner (1998), postvocalic stops require more articulatory effort than postvocalic spirants. He adopts the constraint LAZY that militates against articulatory effort, where a ranking of LAZY above stricture faithfulness allows a spirant to surface in postvocalic position in Spanish. Extending this analysis to L2 Spanish, we assume that learners start with an L1 English ranking in which stricture faithfulness outranks LAZY, proposing separate stricture faithfulness constraints for each prosodic level. We then hypothesize that the L2 Spanish learner will gradually denominate the stricture faithfulness constraints, thereby extending the domain of the stop-spirant alternation until reaching a native-like ranking in which LAZY outranks all stricture faithfulness constraints. Variation is predicted and can be illustrated by overlapping rankings that yield variable outputs.

Between-groups analyses of pilot data from a phrase recitation task performed by intermediate (n=5) and advanced speakers (n=5) of L2 Spanish were statistically significant, evidencing development between intermediate and advanced levels of proficiency in L2 Spanish. Analysis of the intermediate learner data showed within-group effects for prosodic domain, indicating an extension of domains in which the learner applies the stop-spirant alternation to the clitic group and thus demotion of stricture faithfulness constraints that correspond to the clitic group and phonological word (4). However, there were no within-group effects for the advanced learners, suggesting that they have reached the upper limit of the prosodic hierarchy permitted by the target language (the intonational phrase) and therefore have extended the restrictive setting they started with and developed a native-like ranking (5). As typical for L2 learners, there is variation even among the advanced learners, and therefore an Optimality Theoretic account that analyzes learners' productions and acquisition in terms of dynamic interlanguage constraint
rankings is the most adequate for modeling gradual acquisition and the residual variation seen even in highly advanced L2 speakers.

(1) Phonological word (postvocalic word-medial)

/b/ cabra  ['ka.ðra]  ‘goat’
/d/ padre  ['pa.ðre]  ‘priest’
/g/ agua  ['a.ɣa]  ‘water’

(2) Clitic group (post-vocalic across word boundaries)

/b/ una bala  [u'na.bala]  ‘a bullet’
/d/ mi dado  [mi 'ðo.lað]  ‘my dollar’
/g/ la gafa  [la 'ya.fa]  ‘the hook’

(3) Intonational phrase (post-vocalic across word boundaries; single intonational contour)

/b/ buena bala  ['bue.na bala]  ‘good bullet’
/d/ vieja dama  ['bie.xa 'ða.ma]  ‘old lady’
/g/ nueva gafa  ['nue.ja 'ya.fa]  ‘new hook’

(4) Intermediate learners’ ranking (prosodic level: intonational phrase)

<table>
<thead>
<tr>
<th>/biexabaka/</th>
<th>IDENT-IO (CONT) IPH</th>
<th>LAZY (100)</th>
<th>IDENT-IO (CONT) CLGR</th>
<th>IDENT-IO (CONT) PWD</th>
<th>IDENT-IO (CONT)</th>
<th>LAZY (95)</th>
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<td>['bie.xa.'βa.ka]</td>
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(5) Advanced learners’ ranking (prosodic level: intonational phrase)

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<td>['bie.xa.'βa.ka]</td>
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References:
Focusing attention on L2 pronunciation: Does it help?
David Counselman, Ohio Wesleyan University

In the last thirty years, there has been a growing concern with the role that attention plays in second language (L2) learning. However, most research in this domain has focused on morphosyntactic aspects of the L2, while the role of attention in L2 pronunciation learning has been mostly ignored. This study extends research on the role of attention in L2 classroom learning to the realm of pronunciation by comparing the impact of two pronunciation assignments (each administered five times) on first language (L1) English L2 Spanish students’ improvement in pronunciation of the vowels /e, o/ and the consonants /p, t, k/ over one semester. The vowels /e, o/ were examined because /e, o/ are diphthongized in English (e.g. /e/ → [eʰ], /o/ → [oʰ]), so English learners of Spanish tend to erroneously diphthongize these vowels in Spanish. The consonants /p, t, k/ were analyzed because these plosives are aspirated (i.e. /p, t, k/ → [pʰ, tʰ, kʰ]) in stressed syllables in English, and English learners of Spanish often transfer this to their L2 pronunciation.

One pronunciation assignment represented a typical strategy for correcting pronunciation (typical assignment), while the other was specifically designed to direct students’ attention to differences in English and Spanish speech sounds (experimental assignment). For the typical assignment, students were asked to record themselves reading in Spanish from the textbook, and they received feedback on their pronunciation from the instructor. For the experimental assignment, students were asked to listen to other (unknown) learners of Spanish reading in Spanish and to provide feedback on the pronunciation of the speaker. It was hypothesized that students receiving the experimental assignment would exhibit the greatest improvement because this assignment was designed to direct students’ attention to L2 pronunciation in a way that the typical assignment does not require.

Students from two sections of a Spanish conversation class (N=28) participated in the study. Those in one section (N=15) received the typical assignment, and those in the other section (N=13) received the experimental assignment. Both sections were taught by the researcher; aside from the pronunciation assignment, instruction was identical in both sections. All students were recorded reading single words at the beginning (pretest) and end (posttest) of the semester. Students’ productions of /e, o, p, t, k/ at both times were acoustically analyzed so that improvement in pronunciation over the semester could be compared between the sections. To analyze the pronunciation of the vowels /e, o/, the first and second formants were measured at the beginning and end of the vowel, and the change in these formants was calculated to quantify the degree of diphthongization. For /p, t, k/, the degree of aspiration was calculated by measuring the duration from the release of the consonant to the onset of the following vowel.

Results indicate that for the vowels /e, o/, students receiving the experimental assignment improved significantly, while those receiving the typical assignment did not. However, for the consonants /p, t, k/, students receiving both assignments improved significantly. Moreover, there was no difference in improvement between the two sections for these consonants. These results suggest that while attention may play a role in the learning of L2 pronunciation, the importance of attention in the learning process may vary depending on the sound or type of sound being learned. These results also suggest that L1 English L2 Spanish speakers may acquire the consonants /p, t, k/ more easily than the vowels /e, o/.
Acquisition of Spanish voiceless stops in extended stays abroad
Mary Crane & Scott M. Alvord, Brigham Young University

There are many factors that contribute to second language acquisition. Variables such as age of acquisition, type of instruction, learning styles, and time spent in the target culture are but a few among the numerous factors that influence the acquisition of a second language. While there are a few studies that have investigated the effects of study abroad on the acquisition of the Spanish phonological system by adult native English speakers (e.g. Díaz-Campos 2004 and 2006), the role of even longer experiences in Spanish speaking countries (i.e. more than one year) has been relatively understudied. The acquisition of voice onset time (VOT) of Spanish voiceless stops is an area that has seen some attention in the SLA literature (e.g. Díaz-Campos 2004, Lord 2005, González-Bueno 1997). For example, Díaz-Campos (2004), found that the amount of formal language instruction was more important to the acquisition of Spanish /p, t, k/ than time abroad (based on a study of a group who spent 10 weeks abroad). The study of the acquisition of Spanish /p, t, k/ by those who have spent an extended amount of time in a Spanish-speaking country can add to our current understanding of SLA phonology.

The purpose of the current study is to investigate the acquisition of the Spanish voiceless stops /p, t, k/, as measured by VOT, by adult learners who have spent 2 years abroad in a Spanish speaking country. The participants in this study consisted of 20 adult learners of Spanish enrolled in various sections of a third-year Spanish grammar course. All of the participants had recently returned from a 2-year service-oriented stay in a Spanish-speaking country. In addition to whether or not learners were able to produce Spanish-like VOTs, this study also seeks to discover the effects of certain factors (e.g. phonetic context, prior Spanish instruction, time spent with native Spanish-speakers, motivation, cultural sensitivity, etc.) on the productions of VOT in Spanish voiceless stops.

In order to analyze the subjects’ production of the Spanish /p, t, k/, three different speech types were analyzed. The first is a story narration task where students were asked to look at a picture book (Good Dog, Carl, by Alexandra Day) and tell the story as described in the pictures. The others are from read speech, i.e. a passage reading, and a word list. Learners also completed a background questionnaire including information on language use as well as motivational intensity (Gardner 1985) and cultural sensitivity (Cushner 1986). The language production was recorded digitally and VOT measurements of 3997 tokens of /p, t, k/ were made using PRAAT. A mixed models analysis of co-variance was performed to explore the effects of linguistic and extralinguistic variables on the learners’ productions of /p, t, k/.

Results show that learners produce Spanish /p, t, k/ with VOT values much shorter than typical English VOT’s but that they were also longer than typical Spanish VOTs. Additionally, several variables were found to have significant main effects on the production of VOT. Language use while abroad and after is shown to be especially important in producing more Spanish-like /p, t, k/.
Chicagoland heritage and native Mexican Spanish intonation: Three contact phenomena
Nicholas Henriksen, Northern Illinois University

In a recent review article on current issues in heritage language acquisition, Montrul (2010) indicates that heritage language pronunciation is a widely understudied area of linguistic research, even though the limited work in this area shows that there are systematic phonetic and phonological differences between monolinguals and heritage speakers of the same language. It is also well established that intonation is particularly susceptible to cross-linguistic influence in contact situations (Bullock, 2009; Mackey, 2000; Queen, 2001), since it is largely dependent on context and discourse-related properties of speech communication. Empirical data from speakers in bilingual communities reveal a wide range of intonational phenomena at the phonetic level (Colantoni & Gurlekian, 2004; Elordieta, 2003; O’Rourke, 2003) and also at the phonological level (Burridge, 2007; Queen, 2001). As for research on the intonation of Spanish in contact situations, there is a growing interest in this area (Elordieta, 2003; O’Rourke, 2005; Simonet, 2008), but data on US-based heritage Spanish is largely unavailable (cf. Alvord, 2006). This presentation is designed to fill this gap of knowledge by conducting an acoustic analysis of the Spanish intonation of 10 Mexican heritage Spanish (MHS) speakers and 10 Mexican native speakers (MNS) who live in the western suburbs of the Chicagoland area.

MHS is defined in the current study as the speakers of Spanish whose parents emigrated to the U.S. from Mexico and who were educated exclusively in U.S. schools. The MNS speakers emigrated to the U.S. from Mexico and began formal training in English beyond the age 12. The age range for all speakers was between 20 and 40. Speech data were collected from an intonation survey that contained 70 test sentences, for a total 1400 productions submitted to acoustic analysis. This was the same survey used for analysis of Central Mexican Spanish intonation (de-la-Mota, Martin Butraguëño, and Prieto, 2010), based on Prieto (2001). The speakers read each pragmatic context in silence prior to reading aloud each test sentence. Target utterances were read under multiple pragmatic intents, including broad focus and biased statements and questions, commands, requests, and vocatives. Speech data were analyzed using Praat and labeled according to Sp_ToBI conventions (Beckman et al., 2002; Estebas-Vilaplana & Prieto, 2008).

Data analysis focused on three intonational phenomena: the contrast between broad focus, narrow focus, obvious, and exclamative statements; the contrast between information-seeking, confirmation-seeking and echo yes/no questions; and the use of the regionally-distinct Mexican circumflex (L+;H*L%) nuclear configuration. Results indicate that all speakers distinguish the various statement intents in similar fashion. As for yes/no questions, MHS speakers use different configurations for the various intents, whereas MNS speakers fail to do so for information-seeking and echo questions, similar to de-la-Mota et al. (2010). The regional circumflex configuration is observed for MNS speakers, but not for MHS speakers. MHS distinction of information-seeking vs. echo questions is discussed as an additional contact-induced communication resource for the expression of discourse meaning in heritage speech. The absence of the circumflex contour in the MHS data cannot be argued as attrition since the usual prosodic means for the expression of pragmatic meaning are still intact in this variety. In sum, by providing a comprehensive account of the intonational system of Chicagoland MHS and MNS speakers of Spanish, this study provides a foundation for future work in this area to determine what other contact-induced intonational phenomena may be observed in heritage language acquisition.
Selected references


Native speaker perceptions of learners’ acquisition of connected speech in Spanish
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Within research in Spanish SLA, studies on pronunciation are not uncommon, though they have mainly focused on segmental aspects (see, e.g., Selected references). The present study targets the acquisition of the seldom-studied area of connected speech, synalepha and resyllabification, as exemplified below:

Synalepha (V-V linking across words):  
*El hombre retó a su hijita severamente.*
*Enrique aguantó su enojo con decoro.*

Resyllabification (C-V linking across words):
*A esa tabla le faltan los elementos que no son naturales.*

Previous research by the primary author analyzed English-speaking advanced learners’ acquisition of this V-V and C-V linking across words in several ways: (i) looking at improvement during the course of three treatments (summer study abroad; explicit instruction [introductory course on phonetics/pronunciation]; other advanced language classes without explicit instruction or practice in pronunciation), and addressed research questions regarding the different modes and types of exposure to Spanish and their effect on accurate pronunciation, the degree to which explicit instruction predicts improvement of pronunciation, and the relationship between fluency and accurate pronunciation; and (ii), a study of the linguistic variables that impact the realization of linking, and how these compare between native and nonnative speaker groups.

While more careful styles of speech are thought to favor more accurate production, for connected speech phenomena, we might expect that increased speed would lead to better production of synalepha and final-consonant linking. However, results from other phases of this study suggest that this is not fully the case, and that there are additional linguistic variables at play (vowel and consonant quality, morphological structure and affixation, syntactic phrasal structure and prosodic stress), with otherwise phonologically-motivated linking being inhibited by stronger prosodic and structural boundaries.

The current study treats the data from the perspective of native speakers and their judgments regarding the degree of naturalness or native-likeness of second language learners. A panel of native speaker judges evaluated speech samples from the various treatment groups, with stimuli controlled for rate of speech and achievement in linking. The main research question is whether improved mastery of connected speech phenomena is significant for native speaker judges in their consideration of fluency and naturalness, in relation to raw speed of production and rate of lexical recall.

The results of this study promise to contribute to the field of acquisition of Spanish phonology by English speakers, including both in classroom-based learning and full immersion settings, as well to a better appreciation of perceptual factors that condition native speaker judgments of fluency and approximation to native-speaker norms. Thus, this study into the acquisition of connected speech phenomena provides further insight into the subtle contextual and linguistic factors that influence the degree of mastery of elements of nonnative phonology, and that lead to favorable recognition by native speakers, likewise contributing to the field of sociolinguistics in exploring one group of speaker's evaluation of the identity of another based on linguistic factors.
Selected references


The production of diphthongs by second language speakers of Spanish has long been known to be problematic. While the necessity for instruction in this area seems apparent, the best way to implement this instruction is unclear. Bowen (1963) suggests that focusing on the function of semi-vowels in syllable structure might prove useful, but the suggestion is not accompanied by empirical evidence showing that this proves to be useful in the teaching of Spanish. Providing empirical evidence for the usefulness of instruction on diphthongs, Lord (2005) shows that students enrolled in a Spanish phonetics course improved their production of diphthongs, but the methods of instruction are not discussed.

Recent work in second language speech perception (Dupoux et al. 1999, among others) indicates that the perception of sound sequences in the L2 may be subject to interference from the L1 phonology. This leads to the possible conclusion that the production problems with diphthongs by L2 Spanish speakers may be due to misperception of the sequences as having vowels in hiatus. Because some glide–vowel sequences are phonotactically restricted in English, it seems possible that the L1 phonology interferes with the perception of these sequences by L2 Spanish learners. If this is the case, aiding learners in overcoming L1 interference in perception may lead to increases in production accuracy.

Little research exists on the perception of diphthongs in Spanish. Perception studies with native speakers of Spanish (Hualde and Prieto 2002, Face and Alvord 2004) have focused more on the perception of "exceptional hiatus" rather than on the perception of straightforward diphthongs. Perception studies of non-native speakers of Spanish (Kilpatrick and Scarpace 2010, Kilpatrick in submission) indicate that L1 interference occurs in the perception of Spanish diphthongs. L2 speakers were more likely to perceive Spanish diphthongs that are phonotactically restricted in English as two syllables rather than one, but non-restricted diphthongs were more often perceived as a single syllable. This evidence of L1 interference in the perception of diphthongs indicates that the often-noted production problems may actually stem from perceptual interference rather than simply production problems. If this is the case, focused instruction on syllabification and the perception of diphthongs may improve not only perception, but production as well.

We tested the efficacy of focused instruction on syllabification on the perception and production of diphthongs in Spanish through the use of a test–retest methodology. L2 learners of Spanish listened to bisyllabic nonce forms that included diphthongs, such as [ʃa.fo] and [pi.e.go], and judged how many syllables they thought the forms had. Participants were also digitally recorded while repeating the forms. The participants then took part in a short training that compared syllabification of real words in Spanish and English, such as Spanish [pi.ʃa.no] vs. English [pi.ʃæ.no]. After the training, the participants repeated the initial syllable-counting exercise with recording of forms.

Results indicate that judgments of syllable count were significantly different for the pre- and post-tests. In this experiment, we considered judgments of 2 syllables to indicate the perception of a diphthong ([ʃa.fo]), while judgments of 3 syllables indicated perception of vowels in hiatus ([ʃa.fo]). On the pre-test, participants performed at chance levels in their
perception of diphthongs vs hiatus. On the post-test, however, the same forms were judged to have diphthongs over 90% of the time. Preliminary analysis of the recordings indicates that participation in the training sequence also led to an improvement in overall pronunciation, rather than specific improvement only in the production of the diphthongs.

References


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Discrepancy between the perception and production of stop consonants by Spanish heritage speakers in the United States
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The present study investigated the production and perception of Spanish and English voiced and voiceless stop consonants by Spanish heritage speakers who are more dominant in English. Previous studies have argued that it is impossible to control two languages exactly the same way as two monolinguals, even for bilinguals who are fluent in both languages. L1-L2 phonetic interference, the direction and strength of which is determined by language dominance, is inevitable. The aim of this study was to identify whether Spanish heritage speakers whose English (L2) is stronger than Spanish (L1) have their Spanish stop consonants influenced by their English stop consonants, and whether similar tendencies occur in both production and perception. Since native speech perception reaches stability prior to native speech production, it was of interest whether Spanish heritage speakers perform similarly to native English speakers and differently from native Spanish speakers in their production of English and Spanish stop consonants and, vice versa, in their perception. Heritage speakers’ productions of Spanish and English word-initial stop consonants were acoustically analyzed by measuring their Voice Onset Time (VOT). With regard to heritage speakers’ perception, a perception task was conducted with cue-manipulated stimuli. Heritage speakers’ performances were compared to those of native speaker controls. Results show that Spanish heritage speakers did not differ significantly from native English speakers in the production task, while they did in the perception task. Regarding the Spanish stop consonants, the opposite tendencies occurred: Spanish heritage speakers’ production significantly differed from that of native Spanish speakers, whereas their perception did not. The discrepancy found in the production and perception experiments suggests that even though production and perception share a link they should not be considered the same. Thus, the present study concluded that it is necessary to investigate both the production and perception of bilinguals in order to see the big picture of the phenomenon of L1-L2 phonetic interference.

Selected references
What do Spanish learners stand to gain from phonetics lessons added to the FL curriculum?
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Instruction in phonetics and phonology has been shown to reduce L2 learners’ “foreign” accent in some, though certainly not all, cases. Researchers have paid relatively less attention to how learners’ perception of L2 phones changes in response to instruction. Target-like perception is important not only for word identification and parsing of the speech stream, but also is a necessary precursor to target-like L2 production according to some models of L2 phonological acquisition. This paper reports on the advantages that first-, second-, and third-year learners (n=95) of Spanish as an FL gained from explicit instruction in Spanish phonetics and phonology, as compared with a group that completed focused listening exercises (implicit condition). Learners’ perception and production of 8 target Spanish phones were measured in a pre-test, post-test, and delayed post-test design using multiple elicitation tasks. The 8 target phones included a variety of consonantal segments that have proven problematic for L1 English speakers acquiring Spanish as an L2: stop consonants, approximants, and rhotics. The results indicate that phonetics instruction confers a small advantage in tasks related to perception, but no significant advantage for production. The results are discussed in light of the putative link between perception and production, compared with prior research reporting on learners’ production, and used to draw pedagogical implications for college FL Spanish curricula.
A variationist approach to the Speech Learning Model:
Bilingual voice onset time in Panama
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One of the main concerns with voice onset time (VOT) among bilinguals is whether there is evidence of a merged phonetic system, or if bilingual speakers maintain separate categories for each language. In his Speech Learning Model (SLM), Flege (1995a) discovers evidence for cross-language assimilation in bilingual production of stops with compromised VOTs; that is, the stops exhibit values that fall between the prototypical ranges for each language. This evidence has supported his hypothesis of merged phonetic representations in bilinguals. Support for cross-language dissimilation was also found in bilinguals. In this process, speakers deflect, or deviate, from a category in order to maintain a distinction. That is, a Spanish-English bilingual may produce extra long VOTs in English in order to distinguish from longer VOTs produced in Spanish, and this would be evidence for separate phonetic systems. According to Flege (1995b:101), this phenomenon is more common in early bilinguals.

The current study is concerned with further investigating Flege’s (1995a) hypotheses from a variationist perspective. The need for this type of analysis is based on the fact that studies on VOTs tend to compare means alone to determine whether bilinguals feature convergence of two phonetic systems, or if they maintain a distinction between systems. Following Preston’s (1996) discussion on variationist second language research, this study proposes that the comparison of conditioning factors contributing to VOTs can give a more detailed view of how bilinguals treat their languages. Therefore, I adopt the comparative variationist method established by Poplack & Tagliamonte (2001) in which a series of comparisons between monolingual and bilingual varieties of Spanish and Creole English are carried out to find evidence of cross-language assimilation or dissimilation among bilinguals.

The study examines the speech patterns of monolinguals of Creole English and Spanish and early Spanish-Creole English bilinguals in the Republic of Panama. A total of 2134 occurrences of the voiceless dental /t/ were extracted from four language modes: monolingual Creole English, monolingual Spanish, and the bilingual varieties of Creole English and Spanish. The VOT measurements were done using Praat (Boersma & Weenink, 2010). Subsequent, a linear regression analysis was incorporated using Rbrul (Johnson, 2009) to pinpoint the order of effect of the factors conditioning mean VOT values. These patterns were then compared side-by-side to determine whether or not speakers use the languages similarly.

Results indicate that bilingual Creole English and Spanish do not resemble each other in any of the factor groups included in the statistical analysis, that is, there is evidence of cross-language dissimilation. For example, in the mid vowels, /e/ is a favorable context for longer VOTs in bilingual Creole English, whereas in bilingual Spanish /e/ favors shorter VOTs. With regard to phonological environment, V_V is a favorable context for longer VOTs in the bilingual Creole English variety, although this is not the case for bilingual Spanish, where C_V favors longer VOTs. These findings are evidence for separate phonetic systems in terms of VOT duration among early bilinguals in Panama, and this comparative analysis allows us to closely examine the apparent differences. This study seeks to contribute to both variationist and SLA work, by investigating bilingual speech patterns discussed in Flege’s (1995a) Speech Learning Model through variationist methods.
References


The perception of stress in Spanish by L2 hearers: What influences accuracy in perception?
Bret Linford, Indiana University

Lexical Stress has been defined as the relative prominence that a syllable has in comparison to other syllables in a word (Hualde 2005). Stressed syllables in Spanish tend to have relatively greater amplitude (Hualde 2005), greater duration (e.g. Enríquez, Casado, & Santos 1989; Simões 1996), serve as anchor point for intonational events and are related to higher fundamental frequencies (i.e. pitch) (Enríquez, Casado, & Santos 1989; Hualde 2005; Montero 2007). Furthermore, heavy syllables tend to attract stress (Face 2005) and speakers tend to assign and produce stress by analogy to patterns in the lexicon (Aske 1990; Lord 2007; Tight 2007).

Many researchers have begun to study how second language learners acquire lexical stress. Studying lexical stress in second languages is an important line of research because while stress can be phonologically contrastive in some languages (e.g. Spanish and English), it may not be in others (e.g. French). Also, while vowel quality is often related to lexical stress in some languages like English and Portuguese, vowel quality has not been found to be a correlate of lexical stress in Spanish for the most part (Quilis & Esgueva 1983).

Just like many of the studies on L1 Spanish, studies on lexical stress in L2 Spanish have found that L2 learners are also sensitive to acoustic correlates of lexical stress (Face 2005; Schwab & Llisterrri 2010; Alfano, Schwab, Savy, & Llisterri 2010), syllable weight (Face 2005), and patterns in the lexicon (Lord 2007; Tight 2007). In addition, many of the aforementioned studies found that increased exposure to and experience in Spanish by the L2 learner leads to more native-like perception (Face 2005) and production (Lord 2007) of lexical stress.

The current study attempts to shed light on additional factors that may influence the perception of stress in Spanish beyond those already discovered. The principle research questions are:

1. What factors appear to influence the perception of stress in Spanish by L2 hearers in addition?
2. Is there a correlation between proficiency in Spanish and the factors that influence the perception of lexical stress?

The participants of this study were L2 learner groups at five levels of proficiency as well as a native speaker group. All participants completed four perception tasks where they listened to isolated words and words contained within carrier phrases and were asked to assign lexical stress. In addition, the participants completed a word familiarity survey of the words used in the perception tasks, and a background questionnaire. Certain tokens in this task were manipulated using PRAAT (Boersma and Weenink 2011) to equalize the F0, equalize the intensity, or both.

Results show that all L2 learner groups’ accuracy in stress was significantly influenced by several factors such as vowel combination, word context, number of syllables, frequency, pitch and intensity manipulation, as well as speaker dialect. The native speakers, in contrast, only showed two factors significantly influenced their accuracy in stress perception, namely, pitch manipulation and phonological status of the stress.

These results suggest that there are various factors that influence perception of lexical stress in Spanish in addition to what has been found in the previous literature and that many of these factors continue to influence the perception of lexical stress in Spanish even at the highest levels of proficiency in L2 Spanish. Native speakers, in contrast, are influenced by very few factors when perceiving lexical stress in their native language.
Selected Bibliography


Bimodal perception of Spanish back vowels
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It has been well established that most verbal communication involves the integration of both visual and auditory information to process speech (McGurk & MacDonald, 1976). Where the majority of previous research in Spanish L2 speech perception has focused on either auditory (Flege, Munro & Fox, 1995; Morrison, 2003; Bradlow, 1996; Zampini, 1998; Díaz-Campos & Morgan, 2002; Rose, 2010) or visual (Hazan, Sennema & Faulkner, 2002; Soto-Faraco, Navarra, Weikum, Vouloumanos, Sebastian-Gallés & Werker, 2007; Ronquest, Levi & Pisoni, 2010) perception of sound segments, far fewer have investigated audiovisual perception of L2 sound segments (Ortega-Llebaria, Faulkner & Hazan, 2001). Moreover, no study to date has investigated the impact of audiovisual speech on the perception of foreign accent by native Spanish-speaking listeners. Thus, the present study investigates the audiovisual perception of L2 back vowels /o, u/ by native speakers of Spanish to determine the influence of visual cues on foreign accent perception.

The Spanish back vowels /o/ and /u/ were chosen given their unique co-articulation of features that present simultaneous auditory and visual cues for speech perception. Tongue retraction cues the listener for vowel posteriority while lip rounding and protrusion provides the listener with a reinforcing visual cue (Hualde, 2005). To determine the impact of visual information (that is, lip rounding) on perception of foreign accent, conflicting auditory and visual information was presented to native speakers of Spanish for foreign accent rating. Rounded productions (recordings where lip-rounding was present) of no and nu were dubbed onto unrounded video recordings (recordings where no lip-rounding was present) of no and nu, respectively. Recordings for the perception task were collected from two advanced, non-native speakers of Spanish (one male, one female) and two native speakers of Spanish from a Caribbean dialectal region (also one male, one female). Native listeners rated both audio and audiovisual items of both rounded and unrounded productions of no and nu along with a variety of distractor items on a scale from 1 (non-native) to 6 (native). Preliminary results are mixed, suggesting an interaction of several auditory cues that had a greater influence in the perception of foreign accent than the additional visual stimuli provided. The presentation of this study will give some attention to methodological considerations in the L2 audiovisual perception of speech segments as well as avenues for further research.
References


Fostering the acquisition of L2 Spanish segments through online community collaborations
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Recent work in second language phonology has addressed a variety of issues relevant to the acquisition of a new sound system, ranging from problematic areas and mental representations to laboratory training and teaching techniques. In general, researchers have recognized the potential benefits of incorporating increased training in pronunciation at various levels of instruction (e.g., Arteaga, 2000; Castino, 1996; Elliott, 1995, 1997; González-Bueno, 1997; Lord, 2005; Major, 1998; Moyer, 1999; Terrell, 1989), and have investigated various types of explicit training in phonological production both in and out of the classroom. At the same time, technological advances have provided educators with a wealth of interesting tools to foster collaboration among learners and to engage them in input, interaction and output (Long, 1996; Pica, 1994; Swain, 1985), factors that have been shown to be important in L2 acquisition.

For example, collaboration and interaction through chat (Darhower, 2007) or discussion boards (Arnold & Ducate, 2006; Arnold, Ducate, Lomicka, & Lord, 2005; Fahy, Crawford, & Ally, 2001; Paulus & Roberts, 2006) have been shown to foster successful language acquisition among L2 learners. Podcasting, or the distribution of digital audio files using syndication feeds is another such tool that is becoming increasingly popular in education (e.g., Godwin-Jones, 2005; Thorne & Payne, 2005; Warlick, 2005). While most work thus far has considered podcasting’s potential in general communicative contexts, a handful of studies have investigated the use of this tool to improve L2 pronunciation (e.g., Ducate & Lomicka, 2009; Lord, 2008). Specifically, Lord (2008) created podcast communities for learners to engage in critical reflection and analysis of their own skills. She found that participation in the project not only allowed learners to improve their pronunciation, as determined by three judges, but also improved their attitudes towards pronunciation. However, her results are not generalizable given the relatively small sample size, the lack of a control group, and the reliance on judges’ ratings rather than acoustic measurements.

The present study builds upon Lord (2008) by remedying these flaws. Two groups of L2 Spanish learners enrolled in a college-level Spanish phonetics class participated in the study, which consisted of carrying out a series of audio recordings. The participants in the experimental group (n=22) formed small groups with students at another university to create and maintain their own podcasting channels, through which they shared their audio recordings with each other. Learners assessed and reflected on their own pronunciation and that of their groupmates, engaging in ongoing dialogue over the course of the semester. The control group (n=18) carried out the same recordings, but only self-evaluated their own recordings in write-ups for their instructor.

The first and last audio recordings were acoustically analyzed to determine any changes over the course of the semester, focusing on traditionally problematic sounds for L2 learners of Spanish, such as the un-aspirated voiceless stops (/p, t, k/) and the alveolar tap and trill (/r, r/). Results indicate that the experimental group improved their pronunciation on all sounds, while the control group only improved on the trill and the /k/, and continued to show considerable variation in their production.

Results are discussed in terms of the role of collaboration and community building in fostering effective language acquisition environments in general and, specifically, in the development of second language sound systems.
Works cited


Acquisition of /s/ by second language learners of Spanish
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The number of studies that consider the phonological development of second language (L2) learners of Spanish has increased substantially in the past two decades; few, however, study the acquisition of phonological processes, with the notable exception of intervocalic stop consonant spirantization (Diaz-Campos, 2004; Face & Menke, 2009; Gonzalez-Bueno, 1995; Shively, 2008; Zampini, 1994). The present study extends our understanding of the acquisition of phonological processes by exploring how L2 learners of Spanish produce Spanish /s/, a phone which undergoes regressive voice assimilation.

Spanish /s/ has generally been understood to undergo regressive voice assimilation before a voiced consonant (Hualde, 2005) despite some variability according to dialect (Hammond, 2001; Hualde, 2005) and discourse style (Whitely, 2002). Recent work by Schmidt and Willis (forthcoming) on Mexican Spanish suggests however that this process is far from categorical and subject to large degrees of individual variation. In English this voice contrast is both phonemic and allomorphemic in nature. In instances of allomorphemic variation, voice assimilation occurs in the opposite direction as Spanish, depending upon the preceding segment as opposed to the following.

Schmidt (2008), the only study to date to investigate the acquisition of this particular phonological process in Spanish, reported that less than one-fourth of advanced-level undergraduate students of Spanish produced the target-like voiced allophone, [z], in the s+Cvoiced context. Findings from Schmidt (2008) do not indicate how this process develops and/or changes over time as it considers only one group of learners. The current study addresses this issue by including four learner groups; it additionally considers the effect of orthography and whether the word has an English cognate.

A total of 70 native English-speaking L2 learners of Spanish participated in this study (20 fourth-semester university students, 20 graduating Spanish majors, 20 Ph.D. students of Spanish, and 10 “super advanced” learners) in addition to 10 native speakers. All participants were recorded reading aloud an authentic short story. The percentage of sibilant voicing was measured acoustically in Praat and analyzed according to learner level, position in the word, orthography (c, s, z), and cognate status.

Preliminary analysis reveals that the learner participants overall produce /s/ with low levels of voicing. Tokens for which [z] is anticipated are produced with greater percentages of voicing than tokens for which [s] is expected. Orthography does not appear to effect voicing of /s/ for any learner group. With respect to development over “apparent” time, the percentage of target-like productions increases from the fourth-semester learner group to the Ph.D. students. The productions of the “super advanced” learner group, however, do not resemble the target as closely as those of Ph.D. students. These findings will be interpreted in light of findings from other studies to consider the acquisition of phonological processes.
References


Factors affecting the off-gliding of mid vowels
by intermediate-level adult learners of Spanish with L1 English

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In his review of research on the acquisition of second language phonology, Elliott (2003) concludes that formal instruction in L2 pronunciation relates significantly to improvement by learners, at least as regards individual sounds over the short term. Almost half of the studies cited address the speech of L2 learners of Spanish with L1 English, in particular, as regards articulatory differences between consonants in the languages. Differences between the vowel systems of these languages, however, likewise lead to the perception of a marked accent in L2 Spanish. The present study examines one of these crucial differences: the redundant gliding of the mid vowels [e] and [o] on their offset in English versus the contrastive nature of such gliding in Spanish.

The offset gliding of mid vowels is redundant in English, such that words like day [dej] and no [noj] never have contrastive, non-glided counterparts. In Spanish, however, the addition of a palatal glide [ʝ] after [e] or a labiovelar glide [ʝ] after [o] can create meaning contrasts in the language, for example: le [le] ‘to/for him/her’ versus ley [ley] ‘law’, and co- [ko] ‘co- (prefix)’ versus COU [køu], i.e., the spoken abbreviation for Curso de Orientación Universitaria. Given the different status of mid-vowel gliding in the two languages (i.e., purely phonetic in English versus phonological in Spanish), L2 learners of Spanish with L1 English tend to automatically insert glides on the offset of these vowels, contributing to the perception of a markedly non-native accent in their L2 speech. Given that many words in Spanish end in one of three non-high vowels [a, e, o], the transfer of this feature from English is often prevalent.

Results from Nibert (2008), based on paired data sets from five intermediate learners of L2 Spanish, indicate that for both [e, o], automatic off-gliding is more prevalent in word-final position (e.g., norte [nor.tej] ‘north’, poderoso [po.de.ro.so] ‘powerful’) than in word-medial position (e.g., empresa [em.pre jap] ‘enterprise’, soplaba [so.pla ba] ‘it blew’). Furthermore, the following hierarchy emerges, listed from lesser to higher frequency of off-gliding: word-medial [e] < word-final [e] < word-medial [o] < word-final [o]. In sum, the context of [o] at the end of a word seems to be the most challenging for L2 learners as regards the progressive elimination of this L1 feature. The context of [e] in word-medial position seems to be the easiest or earliest from which off-gliding is eliminated.

The current study addresses three subsequent research questions. RQ1: Does the aforementioned hierarchy hold for a larger group of similar subjects? RQ2: Does this hierarchy hold or vary over the course of one semester of explicit instruction in Spanish pronunciation? RQ3: Are there additional factors beyond word position (i.e., word-medial vs. word-final) that reveal patterns of off-gliding? Two additional factors examined are lexical stress (its presence vs. absence on the target vowel) and syllable structure (occurrence in an open vs. closed syllable).

Two recordings each from a total of 30 intermediate-level learners are examined: the first from week 4 of a 14-week semester, and the second from week 13 of the same semester. Each recording entailed the reading of a 97-word short story in Spanish. There are 25 instances of [e] and 36 instances of [o] across the six possible conditions, for a total of 3,660 tokens (=2 x 30 x (25 + 36)). At the mid-point between recording dates (i.e., weeks 8 to 9), learners received instruction on the articulation of Spanish vowels and how these differ from English, based on aggregate information from the course textbook (Barrutia & Schwegler 1994) and Ladefoged (1982). Learners also completed written exercises for homework and engaged in in-class, focused oral practice on the next day of class as well as throughout the rest of the semester.
The data have been subjected to spectrographic analysis. Preliminary results indicate that automatic off-gliding in the read speech of intermediate-level L2 learners of Spanish is most prevalent for [o] in word-final position, in stressed position, and in open syllables, and for [e] in open syllables, with little improvement by the end of one semester of instruction. The implications of this study as regards both pedagogy and SLA theory will be discussed.

**Works Cited**


An exemplar-based cross treatment comparison of learners' acquisition of the Spanish vowel space
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Within SLA, much research has focused on the production of segments. It has been found that a learner’s exposure to L2 target forms increases the accuracy of their productions and moves them closer to native-like norms, e.g. Flege’s Speech Learning Model (SLM) (1988, 1992, 1995, 1999a, 2002). Also, direct instruction of pronunciation and phonetics of the L2 can lead to improved performance, e.g. Dalbor (1997), Elliot (2003), Gonzalez-Bueno (1997), Jenkins (2004). What is lacking is a direct comparison between exposure and direct instruction that would lead to a greater understanding of the relative efficacy of these two methods.

To fill this gap, a comparison of the vowel space drawn from pre- and post- treatment speech samples will be analyzed from three groups: a study abroad cohort, an advanced learner group from an introductory pronunciation/phonetics class, and other advanced classes without explicit pronunciation instruction. These samples will be compared and contrasted with native norms (Bradlow 1995) to determine which group made the greatest gains over the course of the treatment.

A viewpoint that can give an explanation to differing rates of acquisition is Exemplar Theory (ET), a probabilistic framework of perception and production, as in Boomershine (2006), Goldinger (1990, 1996, 1997), Goldinger et al. (1991), Johnson (1990, 1997), Pisoni (1990, 1992, 1997), Pisoni et al. (1985), and Pierrehumbert (2001, 2003). According to ET, a speaker stores a detailed representation of input in the mental lexicon. As the learner is exposed to greater numbers of exemplars or if more attention is paid to particular input (Foulkes and Docherty 2006), greater phonetic detail (in addition to other information) is processed and becomes part of that representation. Thus, as the input changes, the mental representation becomes more attuned to said input.

When applied to SLA, ET would state that the greater the amount of or attention paid to native-like input, the more native-like the representation. As a result, the learner who is exposed to a greater amount of native-like inputs or whose attention is drawn to particular aspects of input would have more target-like representations, and thus a greater probability of more target-like pronunciation, and a more native-like vowel space. In the current study, preliminary results suggest that the study abroad cohort have greater gains and a more target like vowel space post-treatment due to the greater amount of native-like target input. The pronunciation class has also made gains due to the explicit instruction of target vowels and their production, but not the same amount of gains as the study abroad cohort. The other advanced group has moved toward a more native-like vowel space, but has not improved as much as the other groups due to the disparity of native-like input and lack of explicit instruction.

The results of this study contribute to the field of acquisition of Spanish phonology by English speakers, including both in classroom-based learning and full immersion settings, as well as to a better appreciation of the efficiency that different settings and methods have on learners’ approximation to native-speaker norms.

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Spirantization of L2 Spanish /b,d,g/: Factors influencing a gradient phenomenon
Brandon Rogers, Brigham Young University

L1 English speakers who learn Spanish as their L2 have to learn a number of varying and distinct phonological features. Among these features, one of the more difficult ones for native speakers of English to acquire when learning Spanish, are the voiced approximants \([\beta,\delta,\gamma]\) (Elliot 1997). The process that gives rise to \([\beta,\delta,\gamma]\) from the voiced stops /b,d,g/, is referred to as spirantization. Spirantization occurs when the articulatory organs involved in the production of a given phoneme, in the case of the current study the voiced stops /bdg/ in Spanish, move toward the target place or places of articulation (POA) without fully hitting the target. Spirantization has also been found in English casual speech (Bronstein 1960, Brown 1998, Gimson 2008) but it is not obligatory like in Spanish (Zampini 1994, Face & Menke, 2009). Recently, several studies have investigated contributing factors in the acquisition of Spanish \([\beta,\delta,\gamma]\) by native English-speakers, e.g. phoneme (Zampini 1994), study abroad (Díaz-Campos 2004, and Alvord and Christiansen in press), task type (Díaz-Campos 2006), level of acquisition (Shivley 2008) and age of first exposure to Spanish (Face & Menke 2009). However, these studies treat spirantization as a binary phenomenon. Recent studies (Eddington 2011, Hualde, Shosted, & Scarpace 2011, Cole, Hualde, & Iskarous 1999) have shown spirantization by Spanish-speakers to be gradient. By treating spirantization as binary, no measurements were made to determine the extent to which native English-speakers spirantize /b,d,g/ as compared to native Spanish-speakers. The current study examines the effects of level of acquisition, extended experience abroad, motivation, cultural sensitivity, and task type on L2 spirantization of Spanish \([\beta,\delta,\gamma]\) by English-speakers learning Spanish. Acoustical intensity measurements were used to determine the degree to which English-speakers spirantized compared to Spanish-speakers.

For the current study eight students from two university Spanish classes were recorded performing two speaking tasks. The students had to read a short story in Spanish and participated in a brief oral interview similar to ACTFL's Oral ProficiencyInterview (OPI). Intensity differences of intervocalic /b,d,g/ were measured in Praat by marking the low point of the consonant along the intensity curve and subtracting it from the intensity peak of the following vowel. The greater the intensity difference, the less spirantization. Tokens were compared to measurements of three native speakers recorded doing the same speaking tasks. Additionally, each student completed a survey reporting motivational intensity and the Intercultural Development Inventory (IDI). The latter measures cultural sensitivity. A multiple regression analysis was run to determine what relationship each factor had with spirantization.

Results show that some of the significant factors contributing to more target-like pronunciation of Spanish \([\beta,\delta,\gamma]\) are level of acquisition, extended time abroad, and task type. Notwithstanding, results also showed that the more culturally sensitive the students thought they were, the more stop-like their productions of \([\beta,\delta,\gamma]\) (i.e. the less they spirantized).

The results of this study further confirm the notion that the formality of task type creates sound variation in speech. Also shown is that pronunciation improves as level of acquisition and experience abroad increase and that longer time abroad than that of previous studies is required for greater spirantization of \([\beta,\delta,\gamma]\). Finally, this study is one of the first studies using acoustical measurements to evaluate the degree to which L2 learners of Spanish spirantize and further confirms that spirantization is gradient.
References


The effect of speech style on the acoustic distribution of Heritage Spanish vowels
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Indiana University

This investigation has two primary goals: 1) to examine the overall acoustic distribution and organization of Heritage Spanish vowels by analyzing their distances from the center of the vowel space and 2) assess how vowel dispersion differs as a consequence of speech style. Traditional descriptions of the Spanish vowel system argue for a symmetrical five-vowel system that is organized based on vowel height and backness. This system is argued to be fairly stable, showing considerably less variation than that observed in the Spanish consonantal system (Navarro-Tomás, 1918; Hualde, 2005). More recent acoustic analyses of bilingual and monolingual Spanish vowel systems, however, suggest that the system is not symmetrical, and that vowels are positioned within the acoustic space in ways that differ from traditional descriptions (Willis, 2005; O'Rourke, 2010). In addition, the acoustic distribution and organization of Spanish vowels has been shown to vary according to speech style. More specifically, vowels produced in spontaneous speech styles tend to exhibit a more centralized position when compared to vowels produced in controlled speech (Harmegnies & Poch-Olivé, 1992; Willis, 2005; Poch-Olivé et al., 2008). These findings motivate the need for more in-depth analyses of the (a)symmetrical nature of the Spanish vowel system, as well as a closer examination of how speech style affects its organization.

Heritage Speakers (HS) are a specific type of Spanish-English bilinguals who were raised speaking Spanish in the home and exhibit communicative proficiency in the language, but were formally educated almost exclusively in English (Potowski, 2009; Montrul et al., 2008). Current research has established that HS differ from age-matched peers and “late” L2 learners with respect to their morphosyntactic knowledge and pedagogical needs, but fewer studies have focused on HS speech production (Potowski, 2009; Knightly et al., 2003). Heritage Speakers are argued to produce Spanish sounds in a more native-like manner when compared to L2 learner populations, but more recent acoustic research indicates that these speakers exhibit a modified system of pronunciation that differs from the pre-established monolingual norms within the same dialect region (Flege & Eefting, 1987; Menke 2010; Konopka & Pierrehumbert, 2008; Roeder, 2010). Based on these findings, this study will also offer insight into how this particular group of bilingual speakers organizes their vowel space, and demonstrate the extent to which their vowel productions are affected by speech style.

Sixteen HS of Spanish (13 female, 3 male) took part in three different speech production tasks aimed at gathering distinct speech styles: a narrative retelling task (spontaneous), a picture description task (semi-spontaneous), and a carrier phrase task (controlled). The first and second formant frequencies of the tonic, open vowels produced in each task were analyzed via Praat Software (Boersma & Weenink, 2011). The overall vowel space and center point, or centroid, for each speaker was calculated using a method similar to the S-centroid procedure (Watt & Fabricius, 2002), in which the center of the vowel space is calculated based on the F1 and F2 values of /i,a,u/. The Euclidean distance of each vowel from the centroid was calculated in order to examine their overall dispersion.

Preliminary analysis of the Euclidean distance measures indicated that the distribution of Heritage Spanish vowels is not symmetrical. The vowels /æ/ and /e/ were situated closest to the center of the vowel space, followed by /u/ and /o/, and finally /i/. With respect to speech style, the vowels produced in the controlled speech task were dispersed significantly farther from the centroid than those produced in the semi-spontaneous and spontaneous speech tasks. Overall, the results of this investigation suggest that the Spanish vowel system, and especially that of HS of Spanish, may not be as simple and symmetrical as previously believed. These results also strengthen earlier claims of speech style differences in vowel production, and demonstrate that the HS Spanish vowel system exhibits these characteristics as well.


The acquisition of Spanish resyllabification by L2 speakers
Daniel Scarpace, University of Illinois, Urbana-Champaign

Segmentation of the speech stream into words is a critical initial problem for the learner of a foreign language: a learner must be aware of acoustic cues and phonological processes at word junctures in order to correctly identify the lexical items and morphemes that they encounter in naturally occurring speech. Crucially, not all languages exhibit the same acoustic cues to mark word boundaries. While some acoustic cues such as glottalization and prosody may transfer from the L1 to the L2 with beneficial effects, others cues may not match, causing failure to correctly parse words in the L2 (Tremblay, 2011). Additionally, this experiment tests the Autonomous Induction Theory’s application to L2 speech segmentation; as hypothesized by Carroll 2004, it should account for transfer and sensitivity to language universals. This study examines the case of the perception of Spanish phrases, which has resyllabification of consonants across a word boundary (Hualde 2005) by speakers of English, which does not.

In English, the principal cues for word boundary segmentation lie in the presence of aspiration in voiceless stops, glottalization, and F0 contours (Altenberg 2005). Thus, a nice man is distinguished from an ice man by the presence of a glottal stop between the /n/ and the following vowel. In Spanish, however, a misalignment of the syllable and the word boundary is common when word-final consonants are moved into the first syllable of vowel-initial words, thus en el avión ‘in the airplane’ has the possible pronunciation e-ne-la-vión. Thus, English speakers learning Spanish have the task of learning that phrases such as ha sido ‘it has been’ and has ido ‘you have gone’ are homophonous in running speech, as /a-si-do/. In this study, minimal pairs where only the lexical affiliation of /s/ and /n/ are used, such as escribes eco ‘you write eco’ vs. escribe seco ‘s/he writes dry’. L2 Speakers at both a beginning and advanced level listened to 20 such natural tokens and were asked to choose from orthographic representations of the two possible phrases (in progress), as well as unambiguous vowel-initial stimuli with a glottal stop present (e.g. [eskribes#eko] for escribes eco). In a word-monitoring task with the same stimuli, L2 speakers were asked (also in progress) to press a keyboard button as soon as they heard a given consonant or vowel-initial stimulus. As hypothesized, native speakers performed at chance at the task with vowel-initial stimuli because speakers are aware that both resyllabified /s/ and /n/ and word-initial /s/ and /n/ could be represented by the stimuli. If transfer has occurred, L2 speakers will more often choose phrases with word-initial /s/ and /n/, as they will expect a word boundary only when glottalization is present. L2 speakers will perform similarly if they have acquired awareness of this phonological process. This study has wide-ranging implications in several areas: in Spanish phonology, the production and perception of resyllabification has yet to be researched; in psycholinguistics, speech segmentation and word recognition normally does not involve post lexical processes such as resyllabification, despite its strong theoretical importance; and in second language acquisition, the role of transfer in L2 phonology and how multiple systems of segmentation from the two languages may coexist in the mind of one speaker.
Works Referenced
Classroom learners’ perception of foreign accent in Spanish: The role of 2 linguistic cues
Elena Schoonmaker-Gates, Indiana University

Previous research on foreign accent perception has primarily investigated the perception of foreign accent by native listeners, and the studies that included nonnative listeners as judges investigated the ratings of near-native speakers and naturalistic L2 learners (Elliott, 1995; Fayer and Krazinski, 1987; MacKay, Flege, and Imai, 2006; Munro, Derwing, and Morton, 2006; Olson and Samuels, 1973). Previous research has not examined the perception of foreign accent by classroom language learners with different amounts of proficiency or the role of specific linguistic cues on nonnative listeners’ ratings of foreign accent. This is surprising because identifying the characteristics that listeners perceive as accented can shed light on what they attend to in the speech signal which can ultimately inform pedagogy and L2 instruction.

The present study examines the role of 2 linguistic cues on the foreign accent perception of native Spanish listeners and classroom language learners. The read speech of 2 native and 2 nonnative speakers of Spanish was manipulated using the duration tool in Praat (Boersma and Weenink, 2011) to investigate the effects of voice-onset time (VOT) and speech rate on listener ratings. VOTs were manipulated to be both shorter (50% and 25% the original duration) and longer (200% and 300% the original duration) and speech rates were manipulated to be both faster (10% and 25% shorter duration) and slower (10% and 25% longer duration). A total of 26 native Spanish listeners and 160 nonnative listeners heard the speech of the 4 test voices and 11 distracter voices and rated each stimulus on a 9-point scale of degree of foreign accent. The statistical analyses revealed a significant difference between native and nonnative listener ratings of foreign accent, and both VOT and speech rate were significant predictors of native and nonnative listener ratings. While listeners rated utterances with shorter VOTs and faster speech rates as significantly less accented than the unmodified versions, they rated utterances with longer VOTs and slower speech rates as significantly more accented than the unmodified versions.

The finding that native and nonnative listeners differed in their ratings of foreign accent indicates that the highly proficient nonnative listeners in previous studies were not representative of all learner populations. The present study also provides a more detailed account of what L2 learners hear as foreign accented than previous research, investigating the effects of both VOT and speech rate on nonnative listeners’ perception. The results reveal that learners even at the lower levels differentiated between shorter and longer VOTs in their assessments of foreign accent, and the effects of speech rate on accent ratings were also present at all proficiency levels. Additional research is needed to determine whether listeners’ perception of these cues as accented relates to their production abilities, and to examine the contribution of other linguistic features on nonnative listeners’ perception of foreign accent.
Acquiring variable forms in a L2: Perception of Spanish aspirated-/s/ across task types
Lauren Schmidt, University of Missouri-St. Louis

The current study explores the role of sociophonetic variation in the identification of lexical items by English-speaking second language (L2) learners of Spanish. The variable forms used in the investigation were two variants of Spanish syllable-final /s/, the full sibilant form [s] (as in fresco [freʃko]) and the aspirated form [h] (as in freseo [freʃko]). While [s] is common to all varieties of Spanish, [h] as an alternative form of syllable-final /s/ is limited to certain geographic regions such as the Caribbean, Canary Islands, and lowland Latin America (e.g., Hammond 2001, Lipski 1994) and is favored by different social groups (e.g., male speakers, Hoffman 2001) and in more informal or conversational registers (e.g., Lafford 1986, Cid-Hazard 2003) within these regions.

Whereas in Spanish aspirating varieties both [s] and [h] are legitimate forms of syllable-final /s/, only the voiceless alveolar sibilant [s] is a legitimate variant of English /s/. Two tasks were designed to examine how English-speaking L2 learners with varying experience with Spanish identify unfamiliar (nonce) and familiar items spoken with the variable forms of Spanish /s/. A large cross-sectional sample of learners was included (N=213), spanning five levels of experience, in order to explore how perception of aspirated-/s/ develops throughout the learning experience.

Experiment 1: Categorization task. Listeners categorized [s] and [h] variants of word-internal syllable-final /s/ presented in disyllabic nonce (nonsense) carrier words (e.g., [leste], [fohka]). The objective of the categorization task was to determine with which categories L2 listeners associated aspirated-/s/ when forced to rely solely on the acoustic information present in the speech signal. Through the categorization of targeted sounds in nonce words it is possible to access how these sounds are perceived by the L2 listeners.

Experiment 2: Lexical item identification task. Following the categorization task, the same group of L2 listeners completed a lexical item identification task in which they identified familiar real words in Spanish, spoken with the [s] and [h] variants of word-internal syllable-final /s/. Participants also completed a vocabulary familiarity task to ensure familiarity with the lexical items used. The objective of the second task was to determine if the presence of [h] affected lexical access of known Spanish words. While the first experiment forces L2 listeners to rely on the acoustic properties of the variants in their identification, the listeners may use other listening strategies in the second task in accessing known lexical items.

Results show effects of variant, task type, and L2 experience on performance by the L2 listeners. While in both tasks the learners improved in identification accuracy of the aspirated items as experience with Spanish increased, there was a strong advantage in identification of the familiar real word items than of the nonce items for the [h] variant. This difference was found at each of the five L2 levels. There was no difference, however, between tasks for those items spoken with the [s] variant. These findings suggest that L2 listeners use additional listening and/or perceptual strategies when attempting to access known lexical items than when categorizing new target language sounds. The results are discussed in light of a usage-based model (e.g., Bybee 2001, Beckner et al. 2009) for the acquisition of second language sociophonetic variants.
References


Patterns of learning among Spanish Speakers of Portuguese
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Sarah H. Ashby, Brown University, Providence, Rhode Island

This study aims to isolate cognitive processes of language learning, i.e. the internalization of specific language components and metalinguistic or metacognitive learning mechanisms, which serve as predictors of learning processes and can be used to model learning behavior. We analyzed the speaking skills of ten native speakers of Spanish learning Brazilian Portuguese in Brazil. At first, we found that linking rules of phonology, which are different in both languages, can be indicators of their language cognitive levels. Linking patterns indicate not only that the system is being learned, but also the transitions from one language proficiency level to another, such as from “advanced-low” to “advanced-mid,” as well as when a Spanish speaker has probably reached a “superior level” in Brazilian Portuguese.

Next, we conducted an auditory analysis in which we searched for factors (vocabulary, syntax, pronunciation, or other) that were most used by native Brazilian Portuguese speakers to judge the language proficiency level of a native Spanish speaker learner of Brazilian Portuguese. Our goal in this analysis was to tease out linguistic areas that are crucial in judging a foreign speaker’s level of fluency, to ultimately reveal which production errors detracted most and least from a perceived oral fluency.

Finally, after finishing the analysis of the ten speakers, we did a case study of a married couple in our group of subjects. The interest in the couple is that they had similar opportunities to learn Portuguese, they are adult learners about the same age, and one of them is clearly more advanced in oral use of the language than the other. An understanding of the gain difference between both of them has the potential to contribute to our understanding of how foreign language learning takes place. We conclude here that the reason behind the language gain difference of this particular couple is related to their attitude towards learning and their metalinguistic awareness, i.e. interest in teaching, self-corrected errors and sentence repair.

As it can be inferred from the preceding paragraph, our claims regarding cognitive processes in this study are drawn mainly from our subject’s recordings, that is to say their speech production. Therefore, we agree with Swain (1995) and other authors for whom the output plays an important role in the language learning processes. We hope with our study to contribute to the construction of language learning models. Learning models are vital to studies in foreign language because, when correct, they will contain learning predictors, and help our understanding of how language learning takes place. In addition, they inform us effectively on how to optimize learning situations, to improve our assessment tools, and to advance foreign language curricula. Therefore, this study is devoted to contributing to the creation of learning models for Spanish speakers learning Brazilian Portuguese.


Factors affecting VOT in L2 Spanish Voiceless Stops  
Joshua Tanner, Brigham Young University

Studies on L2 phonology acquisition have been few, though more and more studies are being conducted. The common conception is that acquiring a foreign language’s phonology is less important in communication than other areas such as grammar. However, being able to produce the sounds of a language correctly plays a vital role in communication.

One of the many phonological differences between English and Spanish is what is called Voice-onset time (VOT). VOT is the length of time between the release of oral occlusion and the beginning of the vibration of the vocal folds (Hualde 2005). The moment of release of oral occlusion is marked as 0 ms. As such, any vibration of the vocal folds that occurs before the oral release is assigned a negative VOT value and is referred to as voice lead or prevoicing. If voicing begins after the release of oral occlusion, it is given a positive VOT value and is called voice lag. Regarding the voiceless stops, /p, t, k/, English is considered to have long-lag VOT values whereas Spanish has short-lag VOT. Because of this difference, VOT can be an indicator of foreign accent in L2 Spanish speakers with American English as their native language.

Studies have looked at various factors that may affect the acquisition of Spanish voiceless stop VOTs. These factors include linguistic factors such as place of articulation (Lisker and Abramson 1964; Castañeda 1986), vowel height (Klatt 1973, 1975; Weismer 1979; Cooper 1974), rate of speech (Summerfield 1981), and speech style (Major 2001). Nonlinguistic factors include age of learning (Piske et al. 2001; Snow & Hoefnagel-Höhle 1977), formal instruction (Purcell & Suter 1980; Elliott 1995; Flege, Munro, Mackay 1995), and motivation (Terrell 1989). The studies have attempted to show the effects that these factors have on language learning. The present study continues this research and tests a new possible relationship: cultural sensitivity. Cultural sensitivity has been studied in various aspects of second language acquisition (Martinsen 2010), but has not been tested specifically with VOT acquisition. The question that guided this study is what relationships exist between VOT acquisition and place of articulation (/p/, /t/, /k/), motivation, and cultural sensitivity?

Six students from two university Spanish classes read a short story in Spanish in order to measure tokens of each voiceless stop (/p/, /t/, /k/). They also completed a survey of motivational intensity and the Intercultural Development Inventory (IDI). The IDI measures cultural sensitivity. Multiple regression analyses were then run to determine the relationship that these variables have with VOT values.

Results show that, as hypothesized, place of articulation and motivation correlate with VOT. Cultural sensitivity did not show a statistically significant correlation with VOT. However, it was found that the difference between the students’ perception of their cultural sensitivity (how culturally sensitive they think they are) and their actual cultural sensitivity score on the IDI has a statistically significant positive correlation with VOT. That is, those students who thought they were much more culturally sensitive than they actually are produce less target-like VOTs.

This research further solidifies the importance of motivation and level of acquisition in language learning. The results confirm what previous research has found in regards to the relationship of place of articulation effects, motivation and level of learning on both VOT and language learning in general. A new possible variable on language learning was also identified: the difference between perception of cultural sensitivity and actual cultural sensitivity.
REFERENCES


Cross-linguistic influence in the production of Spanish /l/ by native English learners
Erik W. Willis, Megan E. Solon & Kimberly L. Geeslin, Indiana University

The voiced alveolar lateral phoneme /l/ has two main realizations in American English: a “light” variant that occurs in pre-vocalic positions, and a “dark” or “velarized” variant that occurs in post-vocalic positions (Olive, Greenwood, & Coleman, 1993: p. 24). The phonetic inventory for /l/ of Spanish, on the other hand, only contains the “light” variant (Hualde, 2005). Given this difference, and the frequent claim by Spanish pronunciation manuals that interference of the dark /l/ in learner Spanish often contributes to the percept of foreign accentedness (e.g., Schweger & Kempff, 2010), the present study investigates how learners of Spanish as a second language (L2) whose native language is English produce the phoneme /l/ in Spanish. Previous investigations on the contact between Catalan and Spanish demonstrate an effect of the dark Catalan lateral on realizations of the lateral in Spanish (Simonet, 2008; 2010), suggesting a possible similar effect of L1 English on L2 Spanish lateral realization. Thus, the present study aims to characterize the acoustic correlates of the /l/ in learner Spanish spoken by native English speakers, focusing on the contexts in which the influence from English “darkness” would be expected (e.g., syllable and word-finally), and, additionally investigating the potential contribution of other factors not previously described (e.g., preceding vowel quality, following vowel quality, following consonant, lexical stress and English cognates) to potential variation in the realization of /l/ in L2 Spanish.

The participants are 10 learners of Spanish enrolled in a third-year introduction to Spanish linguistics course at a large Midwestern university course. Each participant completed a 25-question multiple choice proficiency test, a background questionnaire, and a task designed to elicit samples of /l/ in various contexts within the word, in phrase-final and non-phrase-final positions, and in both semi-spontaneous and reading styles. The data were analyzed according to eight variables. The dependent variable is the realization of /l/ along a continuum of velarization (as “darkness” is not categorical, but rather a scalar feature, cf. Recasens, 2004). The independent variables include i) position of /l/ in the syllable (onset vs. coda), ii) position of stress (stressed vs. unstressed syllable), iii) characteristics of the following segment (for onsets: following front vs. back vowel; for codas: following bilabial vs. dental vs. velar segment), iv) preceding vowel quality (front vs. back), v) existence or not of a cognate in English, vi) position of /l/ in the phrase (phrase-initial, phrase-medial, or phrase-final), and vii) speech style (semi-conversational vs. reading). Tokens of /l/ in similar contexts were elicited from English word lists to allow for a comparison between the formants values in the L1 and L2 of each participant. Measures of the segmental duration of the /l/ were also extracted for comparison of temporal variation according to each of the contexts.

Each production of /l/ was extracted and analyzed acoustically using Praat (Boersma, 2001). In order to quantify the relative “darkness” of the /l/ tokens, two measures were taken: 1) the second formant (F2) values, recognized as the acoustic correlate of darkness (with lower F2s indicating a more back or velarized production), was measured at the mid-point of each segment; and 2) an F2-F1 calculation was made, with darker laterals expected to have lower F2 values and higher F1 values (given their low, back position) and thus smaller F2-F1 distances. These values were normalized to control for the effect of possible physiological differences. (Simonet, 2010) The normalized values were then analyzed according to each of the previously described contextual variables.
The results suggest that the factors of position in the syllable, the preceding and following segments, and the existence of an English cognate condition the realization of the lateral, with the /l/ in final position and surrounding back and velar segments favoring a velarized production of /l/, indicated by low F2 values (in the 1000-1300 Hz range) and lower F2-F1 values as compared to intervocalic contexts with higher F2 values. We also document variation in the phonation modalities such as creak and voicelessness that could potentially contribute to the perception of a non-native Spanish allophone.

References


Degree of foreign accent in second language Spanish speech
Mary L. Zampini, Le Moyne College

Most published research on second language (L2) Spanish speech has examined ways in which learners produce and/or perceive L2 speech sounds. Little is known, however, about the impact that non-native Spanish speech has on the native Spanish listener; that is, how do native listeners perceive L2 speech? In addition, what factors impact their perception of non-native speech? Munro, Derwing, and colleagues have studied this issue extensively with respect to L2 English (e.g., Munro & Derwing, 1995, 2001; Derwing & Munro, 1997; Flege, Munro & MacKay, 1995; Derwing, Rossiter, Munro & Thomson, 2004; Munro, Derwing & Morton, 2006) and have identified three dimensions of L2 speech from the point of view of the listener: intelligibility (whether or not the utterance is understood correctly), comprehensibility (how easy or difficult the utterance is to understand), and degree of foreign accent (how strong the foreign accent is). Research has shown that these three dimensions of L2 speech are at least partially independent. Drawing from this line of research, this paper will report on a preliminary study that investigated the degree of foreign accent of L2 Spanish speech.

Thirty eight L2 learners of Spanish from across different proficiency levels and three L1 Spanish control speakers were recorded while telling a story and reading a set of six sentences in Spanish. Of the 38 learners, 14 were enrolled in a first-year, second-semester Spanish course (“beginning learners”); 16 were enrolled in a third-year, second semester Spanish course (“intermediate learners”); and eight were advanced Spanish majors who had studied abroad (“advanced learners”). Four of the read sentences were used for the present study. These sentences were presented to 29 native Spanish (NS) listeners, who rated each sentence for the perceived degree of foreign accent. The NS listeners listened to each of the four sets of sentences in random order. In addition, within each set, the listeners heard each sentence three times, presented in three randomized blocks, for a total of (3×41) 123 sentences in each group (123×4 = 492 sentences total). After hearing each sentence, the listeners rated it on a scale of 1 – 9, where 1 was “almost impossible to understand,” and 9 was “no foreign accent / native speaker.” In between these two extremes, each rating reflected a perceived degree of foreign accent (very strong foreign accent; strong foreign accent; somewhat strong foreign accent, somewhat weak foreign accent, etc.).

Overall, the results show a decrease in perceived degree of foreign accent as proficiency level increases: Beginning L2 learners received an overall rating of 4 (somewhat strong foreign accent); intermediate L2 learners received an overall rating of 5 (neither strong nor weak foreign accent); advanced L2 learners received an overall rating of 6 (somewhat weak foreign accent); and the native Spanish speakers received an overall rating of 8 (very slight foreign accent). The results from tests of statistical significance will be presented, and differences among the speaker groups will be discussed. In addition, individual variation and potential differences among individual sentences will be examined. Finally, the implications of the findings and avenues for future research will be discussed.
Works Cited


Perception of VOT in L2 Spanish voiceless stops
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One common conception is that a major determinant of L2 accentedness in production is the underlying problem associated with the perception of L2 phonological structures (Flege 1995). According to Flege’s (1995) Speech Learning Model (SLM), incorrect perception inhibits target-like production. Some studies, however, have suggested that production precedes perception (Zampini 1998). Being able to perceive and produce the sounds of a language correctly plays a vital role in communication.

Spanish and English stop consonants have the same phonetic classification and they are represented by the same phonetic symbols in the International Phonetic Alphabet (González-Bueno 1997). One of the many phonological differences between English and Spanish is what is called Voice-onset time (VOT). Voice onset time is the time interval between the release of the oral closure and the onset of periodicity, which reflects laryngeal vibration. VOT is a major acoustic cue differentiating voiced from voiceless stops (Lisker & Abramson 1964). English voiceless stops have a long-lag VOT whereas Spanish voiceless stops have a shorter lag (González-Bueno 1997). Sometimes L2 speakers perceive erroneously these sounds because they are so similar phonetically. In word initial position, the short voice lag corresponds to phonemic /p/ in Spanish but in English it corresponds to an allophonic realization of phonemic /b/ (Hualde 2005). Therefore, it is common for English speakers to perceive Spanish /p/ as [b], e.g. pesa, weight, perceived as besa, to kiss.

Previous studies have attempted to show the relationship between perception and production of Spanish stop consonants (Best 1995, Brown 2000, González-Bueno, Roseman 1987, Lisker & Abramson 1964, Lisker & Abramson 1967, Strange & Shafer 2008, Summerfield 1981, Zampini 1998). The present study continues this research. The guiding question of this study is this: Given a scale of voiced onset time, at what point do learners start perceiving Spanish voiceless (/p/, /t/, /k/) as voiced?

To reach a conclusion regarding the research question, twelve students from two university Spanish classes participated in a discrimination task of 15 Spanish minimal pairs contrasting /p, t, k/ with /b, d, g/ as well as 5 minimal pairs serving as distractors. The stimuli were produced by a native speaker of American English with L1 VOT production of voiceless stops rather than Spanish-like VOTs. The voiceless stops were then manipulated using Praat and the VOT was deleted in intervals of 60%, 85%, 90%, 95%, and 100% of the VOT. In the discrimination task, students first were taught the vocabulary and then listened to the recorded stimuli. They saw a computer screen with two pictures, each picture representing a different member of a minimal pair, e.g. pesa vs. besa. They were asked to choose the picture that best represented what they heard. There were 125 slides, 7 slides per minimal pair containing voiced and voiceless stops (each one containing a different interval of VOT or the voiced variant) and 20 slides of distractors. The slides were presented to the students in random order.

Results show that, as hypothesized, with less VOT learners started perceiving the words with initial voiceless stops as voiced.
REFERENCES


