Effects of regional variation on speech processing for L2 learners of Spanish

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Research Area

- Listeners encounter a great deal of variation in the speech signal
  - Contextual variation: *un sapo* [un-sa-po]  *un beso* [um-be-so]
  - Social and regional variation: *la calle* [la-ka]-e]  ~  [la-ka-fe]
  - Stylistic variation: *asustado* [a-sus-ta-ðo]  ~  [a-suh-ta-o]
  - Individual speaker variation

What is the role of language variation in the acquisition and use of a second language (L2)? → Variation and Second Language Acquisition (e.g., Bayley 1996, Young 1999, Preston 2000, Tarone 2007, Geeslin & Long 2014)

*Important Step: What is the effect of variation in the speech signal on speech processing for a L2 speaker?*
Variation affects L2 comprehension

- Evidence of effects of dialectal speech (regional, ethnic varieties) for both native and L2 comprehension of speech (e.g., Eisenstein & Berkowitz 1981, Major et al 2005)

- For Spanish (Trimble 2010, Schoonmaker-Gates 2013):
  - greater intelligibility of some varieties – Mexico, Peru, (Spain)
  - lesser intelligibility of others – Argentina, Caribbean, (Spain)
Variation affects L2 comprehension

- **Diminishing effect** of dialectal variation on L2 comprehension
  - With increased proficiency / Spanish experience (Trimble 2010)
  - Study abroad in the dialect region (Schmidt 2009)

- **Exposure** to different varieties may lead to **differences** in how variants perceived → dialect contact
  - L2 French and German (Baker & Smith 2010, Smith & Baker 2011) and L2 English vowels (Escudero & Boersma 2004)
  - ...however, not always (Fox & McGory 2007) – sociolinguistic factors at play
Processing variation – L2

When L2 learners encounter speech with unfamiliar or infrequent variants

- Predict that may have effects on L2 speech processing…
  - weak (or absence of) representations – particularly if variants not common in L2 classroom or traditional L2 experience
    - may slow reaction time (increased processing time)
    - may impede comprehension (lexical retrieval)
  - need for devoting greater attentional resources?
Objectives of the current study

1. To investigate the effects of dialectal phones on L2 speech processing, in terms of:

   a) lexical retrieval
   Is the intended lexical item retrieved (comprehended)?

   b) processing costs
   How does the presence of variable sounds affect processing time?

2. To determine if these effects diminish with increased L2 proficiency (overall L2 experience)
Dialectal variables

1) **Spanish /s/-aspiration:**
   - coda full sibilant [s]    *las pistas* [las-pis-tas]  ‘the clues’
   - coda aspirated [h]      *las pistas* [lah-pih-tah]  ‘the clues’
   - found in many regional varieties (up to 50% of world’s varieties)
   - subject to social and stylistic variation within those varieties

2) **Spanish Rioplatense assibilated palatal (sheísmo):**
   - palatal fricative [ʝ]    *las calles* [las-ka-jes]  ‘the streets’
   - assibilated palatal [ʃ]  *las calles* [las-ka-fes]  ‘the streets’
   - limited primarily to Rioplatense region (Buenos Aires, Montevideo)
   - categorical use by those speakers who produce [ʃ]
Full-/s/  [foska]

Aspirated-/s/  [fohka]
**Palatal fricative** [goːʃe]

**Assibilated palatal** [goʃə]
Method

- **Lexical Decision Task** – decide as fast as possible if is a Spanish real word or not
  - speaker = female, university-educated, from Buenos Aires
  - 2 target conditions:
    1) coda full sibilant [s] vs. coda aspirated [h]
    2) palatal fricative [ʝ] vs. assibilated palatal [ʃ]
  - 2 versions of the task – counter balanced target stimuli
  - measured: (a) word judgments and (b) reaction times (RT)

- **Lexical Item Familiarity Task** (known / familiar / unknown)

- **Language Background Questionnaire**
<table>
<thead>
<tr>
<th></th>
<th>real words</th>
<th>nonwords</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>example</td>
<td>N</td>
</tr>
<tr>
<td>coda [s]</td>
<td>13</td>
<td>fie[s]ta</td>
<td>10</td>
</tr>
<tr>
<td>coda [h]</td>
<td>13</td>
<td>tri[h]te</td>
<td>10</td>
</tr>
<tr>
<td>syllable-initial [j]</td>
<td>12</td>
<td>ca[j]e</td>
<td>10</td>
</tr>
<tr>
<td>syllable-initial [f]</td>
<td>12</td>
<td>[f]uvia</td>
<td>10</td>
</tr>
<tr>
<td>distractors</td>
<td>40</td>
<td>leche, puerta</td>
<td>59</td>
</tr>
<tr>
<td>Total</td>
<td>90</td>
<td></td>
<td>99</td>
</tr>
</tbody>
</table>

*Table 1. Lexical Decision Task Stimuli (per version)*
## Method – Participants

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M Age</th>
<th>Description</th>
<th>M Grammar Score (15)</th>
<th>Self-Assigned Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NS - Argentina</strong></td>
<td>18</td>
<td>25</td>
<td>University students in philosophy and language; Native speakers of Spanish, Buenos Aires</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>(23-32)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>L2 - Intermediate</strong></td>
<td>32</td>
<td>24</td>
<td>L2 Spanish 2000/3000 level classes</td>
<td>6.6 (3-10)</td>
<td>low to high intermediate</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>(18-45)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>L2 - Advanced</strong></td>
<td>19</td>
<td>27</td>
<td>L2 Spanish 3000/4000/5000 level</td>
<td>10.9 (9-15)</td>
<td>high intermediate to high advanced</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>(20-45)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Results

Argentine NS Results
Results – Argentine NS RTs

**REAL WORDS**
Significant Effect of **Variant**:

- Slower RTs for nonlocal [j] than local [ʃ]
- No difference in RTs for [h] and [s]

**NONWORDS**
**Variant** not significant (nonwords)

Slower RTs for nonce words than real words overall
Results – Argentine NS Judgments

**REAL WORDS**
Significant effect of **Variant**:  
- Presence of nonlocal variant [ʝ] impeding lexical retrieval  
- 86% real word judgment accuracy [ʝ] vs. 96-99% for other conditions

**NONWORDS**  
**Variant** is not significant
Results

L2 Results
Results – L2 RTs

REAL WORDS
Significant effect of Variant:
• slower RTs for [h] than standard [s]
• slower RTs for Argentine [ʃ] than [ʒ]

NONWORDS
Significant effect of variant for L2 nonwords:
• faster RTs for [ʃ] than [s ʒ] (faster “rejections”)

As for the NS, slower RTs for non- than real words (except for [ʃ] real 1.72, nonword 1.70)
Results – L2 Lexical Judgments

REAL WORDS
Significant effect of **Variant**:  
- less accurate recognition of real words with [h] (84%) than standard [s] (97%)  
- less accurate recognition of real words with Argentine [ʃ] (49%) than [ʃ] (94%)

NONWORDS
Significant effect of **Variant**:  
- Higher accuracy in rejection of nonwords with [ʃ] variant  
- Accepting nonwords as Spanish real words 22%-33% of the time for other variants; only 8% of the time for [ʃ]
Results

L2 Development
Results – L2 RTs by Level (Real Words)

Level is significant – only for standard variants

Advanced group faster than intermediate group – but for non-dialectal variants only –

• no sig difference across level for dialectal [ʃ] (p=.29) or [h] (p=.08)
Results – L2 Lexical Judgments by Level (Real)

Overall, same pattern in effect of dialectal variant at each level
- Sig differences between [h] & [s] and [ʃ] & [ɻ] for both INT and ADV groups

Significant interaction Level*Variant –
- L2 ADV more accurate in lexical judgments than L2 INT for dialectal [ʃ] and [h], and for [ɻ] (ceiling level effect of other variants?)
Results – L2 Contact with Rioplatense Spanish

Of the 51 L2 participants (Midwest U.S.):
- N=0 had studied or traveled abroad to Argentina
- N=5 reported social contacts from Argentina (1 INT, 4 ADV)
Discussion I

Is there an effect of dialectal phonological variation on L2 speech processing in terms of: **PROCESSING COSTS**?

- Yes.
  - Slower RTs (greater processing costs) for items with the aspirated [h] variant than the full sibilant variant [s]
  - Slower RTs for items with the assibilated palatal variant [ʃ] than the palatal fricative variant [ʝ]

- **WHY?**
  - Unfamiliar (or less common) variants, [h, ʃ] –
    - less likely to form part of the “pedagogical norm”
    - weaker (or lack of) representations, more difficult to access
Discussion II

Is there an effect of dialectal phonological variation on L2 speech processing in terms of: **LEXICAL RETRIEVAL**?

- Yes.
  - Variants [ʃ] and – to lesser degree [h] – impeding retrieval of Spanish lexical items (failure to judge (known) real items as Spanish words)

- **WHY?**
  - Appears that [ʃ] variants are unfamiliar to this L2 group –
    - possibly due to lack of exposure or other factors, have not acquired [ʃ] variant
  - Treating real word stimuli with [ʃ] variant as nonword items?
    - slower RTs (within range of nonword RTs),
    - tendency to reject both real and nonword items with [ʃ] variant as Spanish words
Discussion II

Why does $\emptyset$ have a greater effect on speech processing than [$h$] for this L2 population?

a) universal difficulty of $\emptyset$ → NO.
   - this variant had the LEAST effect for the Argentine listeners

b) familiarity → POSSIBLE
   - $\emptyset$ limited to Rioplatense region, potentially less frequent in input
   - [$h$] in many Spanish varieties

c) effects of L1 phonology → POSSIBLE
   - /ʃ/ and /ʝ/ contrastive in the L1 (shoe vs. you), difficult to “converge” two L1 phonemic categories
   - /s/ and /h/ also contrastive in the L1, but not in syllable-final position
Discussion III

Are there changes in processing the dialectal variants across L2 level?

- Not much.
- Similar RT patterns and lexical judgment patterns observed for both L2 levels:
  - Advanced L2 group faster in making judgments than Intermediate L2 group for standard variants but not for dialectal / stylistic variants [h, ʃ]
  - Lessening of effect of [h] and [ʃ] variants on lexical retrieval for Advanced L2 group than Intermediate L2 group
- Why little to no change with increased proficiency?
  - Dependent upon individual dialect contact experiences, rather than overall proficiency → personal contacts, metalinguistic knowledge (linguistic training)?
Conclusions

1. Varying effects of dialectal phones on L2 speech processing
   - aspirated-/s/: more or less successful in retrieving intended lexical item, but longer processing time
   - assibilated palatal [ʃ]: longer processing time AND impedes lexical retrieval of intended lexical item

2. Effect of L2 experience:
   - advanced group faster RTs overall, more likely to reject nonwords
   - those individual learners with dialect exposure (social contacts) may have an advantage: lexical items activated by dialectal forms
Conclusions

- Limitations:
  - This learner population – little contact with Argentine variety
  - How the L2 learners are approaching the task
    - Could L2 listeners be basing judgments based on (perceived) permissible Spanish sounds rather than accessing stored representations?
    - METHODOLOGICAL IDEAS TO MAKE SURE PARTICIPANTS NOT USING THIS STRATEGY?

- Next Step of the Research:
  - Dialect exposure treatment (study abroad) and interaction with L2 level
Questions & Comments

Thanks!

Questions? Suggestions?
References


