Going, going, gone?

Devoicing of Unstressed Final Vowels in São Paulo Portuguese

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Reduction of Unstressed Vowels

- Range of realizations:
  shortened >> devoiced >> deleted

- Other languages:
  - Spanish: Peru, Ecuador, Mexico (Delforge 2008a, 2008b, Lipski 1990)

- Dialects of European Portuguese:
  - São Miguel (Silva 1998)
## São Paulo 2010 Corpus

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age-Group</th>
<th>Level of Education</th>
<th># Informants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>20-34</td>
<td>High School</td>
<td>5</td>
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<tr>
<td></td>
<td></td>
<td>College</td>
<td>5</td>
</tr>
<tr>
<td></td>
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<td></td>
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<td>5</td>
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<tr>
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<td>60+</td>
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<td>College</td>
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<td><strong>Total:</strong></td>
<td><strong>60</strong></td>
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Sub-Sample for this Study

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<tr>
<td>Female</td>
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<td></td>
<td></td>
<td>College</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Total:</td>
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<td>24</td>
</tr>
</tbody>
</table>

Variable Context

- Word-final unstressed vowels
- ~30 tokens/speaker extracted from recorded sociolinguistic interviews
  - Balanced for vowel
  - Balanced for preceding context (voiced/voiceless)
  - Maximum 2 tokens per lexical type per speaker
- 727 tokens
- Each token impressionistically coded as voiced or devoiced
Examples

- **junto** 'together'
  - Alberto 13:43

- **bastante** 'a lot'
  - Júnior 20:23

Examples

- **diferença** 'difference'
  - Janaína 8:20

- **diferença** 'difference'
  - Janaína 8:20
Examples

‘Doing the laundry ‘cuz she has a daughter right…
daughter the husband… she says “how can I rest”? 
rest a bit on Sunday… and she’s there all day long she 
leaves in a little bit at five when it closes… it’s very
tiresome’

Multivariate Analysis

- Overall frequency
- Conditioning of features by contextual factors
  - Social factors
  - Linguistic factors
- Rbrul (Johnson 2009)
  - Logistic regression
    - Statistical significance of independent factors
    - Contribution of each factor to the variation
      - Factor weights (0 - 1, centered on .5)
      - Logodds (-∞ - ∞, centered on 0)
    - Mixed-effects model
      - Random effects (speaker, lexical item)
      - Fixed effects (independent factors)
Linguistic Factor Groups (Independent Variables)

- **Vowel:**
  - /e/ → [i]
  - /o/ → [u]
  - /a/ → [ɤ]

Linguistic Factor Groups (Independent Variables)

- **Preceding phonological context:**
  - Voiced obstruent (+ /Cr/)
  - Voiceless obstruent (+ /Cr)
  - Nasal
  - /r/
  - /l/
Linguistic Factor Groups (Independent Variables)

- Following phonological context:
  - Pause
  - Vowel
  - Voiced consonant
  - Voiceless consonant

Social Factor Groups (Independent Variables)

- Social:
  - Sex
    - Female, Male
  - Age (group)
    - 21-34, 35-59, 60+
  - Education
    - High school, College
  - City zone
    - Center, South, East, West, North
  - City area
    - Center vs. Periphery
## Linguistic Conditioning

### Vowel

<table>
<thead>
<tr>
<th>Vowel</th>
<th>logodds</th>
<th>factor weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>[i]</td>
<td>0.592</td>
<td>.64</td>
</tr>
<tr>
<td>[u]</td>
<td>0.551</td>
<td>.63</td>
</tr>
<tr>
<td>[ə]</td>
<td>-1.103</td>
<td>.25</td>
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</table>
### Preceding Phonological Context

<table>
<thead>
<tr>
<th></th>
<th>logodds</th>
<th>factor weight</th>
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</thead>
<tbody>
<tr>
<td>Voiceless obstruent</td>
<td>1.526</td>
<td>.82</td>
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<tr>
<td>Voiced obstruent</td>
<td>0.614</td>
<td>.65</td>
</tr>
<tr>
<td>Nasal</td>
<td>-0.052</td>
<td>.49</td>
</tr>
<tr>
<td>/r/</td>
<td>-0.300</td>
<td>.43</td>
</tr>
<tr>
<td>/l/</td>
<td>-1.788</td>
<td>.14</td>
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</table>

### Following Phonological Context

<table>
<thead>
<tr>
<th></th>
<th>logodds</th>
<th>factor weight</th>
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</thead>
<tbody>
<tr>
<td>Pause</td>
<td>0.928</td>
<td>.72</td>
</tr>
<tr>
<td>Voiceless Obstruent</td>
<td>0.694</td>
<td>.67</td>
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<tr>
<td>Vowel</td>
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<tr>
<td>Voiced Obstruent</td>
<td>-0.804</td>
<td>.31</td>
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</table>
Social Conditioning

Level of Education by Age-Group

% Devoicing

Young | Middle | Old

High School

College
Discussion

- Devoicing preferred by:
  - Older females, lower level of education
  - High vowels ([i], [u])
  - Preceding voiceless segments (/r/ “skipped”)
  - Following voiceless segments
  - Results similar to those of other studies
  - Preference with high vowels may reflect articulatory and perceptual considerations
  - Effect of voiceless consonants can be explained by “gestural overlap” (Browman & Goldstein 1990; Delforge 2008a)
  - Tendency for certain phonological features to spread (voicing, nasalization, vowel harmony)
Future Work

• More data!
  • More tokens for each speaker
  • More speakers
    • Better representation of social groups
• More detailed acoustic analysis!
  • Shortening vs. Devoicing vs. Deletion
• More factors!
  • Prosodic position
  • Speech rate
  • Style

Obrigado!
References


