Coarticulation in Two Fricative-Vowel Sequences of Latin American Spanish

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Coarticulation in two fricative-vowel sequences of Latin American Spanish

Jeffrey Renaud, Augustana College, Rock Island, IL
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1. BACKGROUND
Dialectal surveys of Latin American Spanish (Resnick 1975) describe three main pronunciations for fu and fo sequences: [f], velarized [x], bilabialized [ɸ].

While the velar realization has received phonetic and theoretical consideration (Lipski 1995, Mazzaro 2011), little is understood about the voiceless bilabial fricative [ɸ] in Spanish. This paper describes a three-part production study in order to uniformly account for the unfaithful velar and bilabial realizations.

Mazzaro (2011) does so by arguing that listeners misperceive a speaker’s intended [fu] as [xu] (or [fo] as [xo]) and will, in subsequent speech, articulate [xu] instead. Coarticulatory accounts would argue that speakers retract the fricative from [f] to [x] or, in the case of bilabial [ɸ], assimilate lip-roundedness.

2. RESEARCH QUESTIONS and PREDICTIONS
a. What are the phonetic characteristics of the allophones?
b. Are the processes phonetically motivated?

If (mis)perception were the sole motivating factor, we expect discrete points of articulation in the [xu], [x], [f], and [f] pronunciations, as opposed to a high degree of coarticulation under an assimilatory account.

3. PARTICIPANTS
Experimental (“exp”; assimilation)
Ch Chile 40, 34 M, M 8th grade, 12th grade custodians
Mex Mexico 38, 35 F, M 6th grade, 3rd grade performer, artisan

Control (“ctr”; no assimilation)
Ch Chile 40, 28 F, F technical, university secretary, student
Mex Mexico 31, 54 M, F Master’s, preparatory coach, homemaker

4. METHODOLOGY
Three production experiments were recorded and analyzed in Praat.

a. Interview (n=10)
¿Cómo celebran Uds. los feriados y los días familiares importantes?
How do you (and your family) celebrate important family holidays?

b. Sentence reading (Chile only; n=200)
Nadar en los ríos profundos puede ser peligroso si uno no tiene cuidado.
Swimming in deep rivers can be dangerous if one is not careful.

c. Picture description (n=85)
¿Cómo celebran Uds. los feriados y los días familiares importantes?
How do you (and your family) celebrate important family holidays?

5. RESULTS
1. Data
Total n fricatives × group

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<tbody>
<tr>
<td>[f]</td>
<td>186</td>
<td>208</td>
<td>8</td>
<td>64</td>
<td>266</td>
</tr>
<tr>
<td>[x]</td>
<td>157</td>
<td>211</td>
<td>49</td>
<td>106</td>
<td>362</td>
</tr>
<tr>
<td>Total</td>
<td>551</td>
<td>536</td>
<td>121</td>
<td>249</td>
<td>1457</td>
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2. Center of gravity (research question a)
Mean frequency in frication

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<thead>
<tr>
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<tbody>
<tr>
<td>[f]</td>
<td>135</td>
<td>135</td>
<td>135</td>
</tr>
<tr>
<td>[x]</td>
<td>135</td>
<td>135</td>
<td>135</td>
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<tr>
<td>Mean</td>
<td>135</td>
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</tbody>
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3. Locus equation (research question b)
↑ slope=↑ coarticulation

country insignificant: F(1, 69.706)=92.887; p<0.001
*group significant:
F(1, 69.706)=92.887; p<0.001

6. CONCLUSIONS
a. What are the phonetic characteristics of the allophones?
Center of gravity measurements and visual cues identified three distinct /fi/ allophones: [f], [x] and [φ]

b. Are the processes phonetically motivated?
Yes; locus equations show gestural coarticulation in /fu/ and /fo/ sequences, but not in /fi/ and /fe/ sequences.

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