A Sociophonetic Study of the French [R]: Socioeconomic Factors Reflected in Linguistic Variation
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« Introduction »

• Rhotics, /R/-like sounds, are subject to much variation in their production cross-linguistically (Ladefoged & Maddieson 1996).
• French /R/ is described as changing its pronunciation from a traditional uvular trill to become approximant or fricative (Russell Webb 2009).
• Voicing of /R/ can also vary from voiceless to voiced.
• Colantoni & Steele (2005) provide various arguments that question the validity of the liquid class (rhotics and laters) due to rhotic variability.

Goal of the study: analyze /R/ variation in Metropolitan French and explore the role that linguistics and social factors play in shaping that variation.

« Methodology »

Participants
• Three requirements for speakers:
  1) at least 18 years old
  2) have French as their native language
  3) lived in Paris for an extended period of time (at least ten years)
• Primary languages: native language, those spoken fluently or with family

Speaker Demographics

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age</th>
<th>Place of Origin</th>
<th>Primary Languages</th>
</tr>
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<tr>
<td>M1</td>
<td>21</td>
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<td>French, English</td>
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<tr>
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<td>20</td>
<td>Le Lamentin, Martinique</td>
<td>French</td>
</tr>
<tr>
<td>M3</td>
<td>20</td>
<td>Les Abymes, Guadeloupe</td>
<td>French, Antillean Creole</td>
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<td>F1</td>
<td>68</td>
<td>Le Mans, France</td>
<td>French, English</td>
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<tr>
<td>F2</td>
<td>45</td>
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<td>French, Spanish</td>
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<td>F3</td>
<td>25</td>
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<td>French, Bassa</td>
</tr>
<tr>
<td>F4</td>
<td>35</td>
<td>Chartres, France</td>
<td>French</td>
</tr>
</tbody>
</table>

Tasks and Stimuli
• Participants performed three tasks in the recording to obtain different styles:
  1) reading task – a series of words containing rhotic in different environments (see below) in carrier sentences;
  2) picture description task of Parisian monuments containing rhotic;
  3) interview – simple questions to elicit spontaneous speech.
• /R/ could appear in the following environments:
  • Syllable position: onset, coda, complex onset
  • Onset: arbois, arbo; summer, summer; meaner, meaner
  • Complex onset: drapeau, flag; offers you offered
  • Word position: word initial, medial or final
  • Stress: unstressed or stressed syllables
  • Preceding consonant for complex onsets: /t, d, f/
  • Following consonant for medial codas: voiceless vs. voiced consonants
    • Voiceless: marquer ‘to mark’; participre ‘participate’
    • Voiced: renvoie ‘he/she finishes’, apparemment ‘widely’

Data Analysis
• Acoustic analysis was performed using spectrograms and waveforms created with WaveSurfer 1.6.8 p3 in order to categorize the participants’ rhotic production according to manner of articulation (approximatic, fricative, trill) and voicing.
• Voicing bar (spectrogram) and periodicity (waveform) to determine voicing
• Formants (both) or lack of formants
• Aperiodic noise in upper frequencies (spectrogram) or aperiodic waves
• Categories created based on acoustic info:
  • Approximant (voiced and devoiced)
  • Fricative (voiced, voiceless, and devoiced)

« Results »

3) Complex Onsets: most tokens were voiceless fricatives (62.5%) and approximants (28%).
• Neither word position nor speaker have an effect on rhotic pronunciation, whereas the following consonant greatly influences rhotic production.
• Voiceless segments /f/ and /r/ typically favor voiceless fricatives (91% & 94.5% respectively).
• Voiced consonant /d/ favors approximants (80%) and voiced fricatives (14%).

There were some voiced trills in the data but given the small number of tokens, they were not included in the analysis. In addition, these trill productions were only found in the reading task. Russell Webb (2009) claimed the presence of Standard French trills in emphasized speech; therefore, the reading task is classified as such.

Picture Task
• Analysis supports findings in reading task.
• In this task, syllable position but not speaker had an effect on rhotic realization.
  • Slightly higher percentages of approximants in onset and coda (90% and 78% respectively); no fricatives in onset position in this task.
  • Complex onsets display more approximants (50%) than voiceless fricatives (37%), which is due to the uneven amount of tokens starting with a voiced consonant /R/ or /R/.

Interview Task
• Lack of even distribution for all environments in data yielded provided for difficulty in generalizing data (esp. concerning the following consonant in codas).
• Similar to reading task, first member of complex onset influences rhotic production, e.g. /d/ yields approximant or voiced fricative while /f/ and /r/ yield voiceless or devoiced fricatives.
• Onsets favor approximants (80% word-initially and 100% word-medially).

Reading Task
• Three syllabic positions:
  1) Coda: majority of tokens were approximants (60%) and voiceless fricatives (20%).
  2) Speakers, word position, and following consonant influence rhotic production:
    • Speakers F1 and F4 show the lowest % of approximants (28%)
    • Word final position – approximants (69%) and devoiced approximants (22%)
    • Word medial position – approximants (49%) and devoiced approximants (25%)
  3) Onset: rhotics show tendency of being approximants (77%), followed by voiceless fricatives (7%)

• Word position – approximants (60%) and voiceless fricatives (38%)
• Word medial position – approximants (85%) and devoiced approximants (10%)

There were some voiced trills in the data but given the small number of tokens, they were not included in the analysis. In addition, these trill productions were only found in the reading task. Russell Webb (2009) claimed the presence of Standard French trills in emphasized speech; therefore, the reading task is classified as such.

« Conclusion »

• The data shows a higher production of approximants in most environments (with the exception of complex onsets with a voiceless sound as first member of onset).
• Surrounding consonants have a large effect on rhotic pronunciation; /R/ will usually mimic the voicing and manner of these sounds.
• Variability of rhotic (as mentioned in previous research) has been proven, perhaps suggesting that the /R/ will leave the liquid class.
• Based on results, internal, linguistic effects more strongly influence rhotic production in Standard French than social factors found in the speakers.
• Further research: more accurate analysis of rhotics obtained in spontaneous speech; speech patterns of persons residing outside of Paris in Northern France.

« Sources »