Perception of Non-Native French Vowels by Native English Speakers

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Linguistics

• The study of language and its structure
• Phonology: A branch of Linguistics focused on the phonetics of a language
• IPA: International phonetic alphabet
• Placement, rounding
• Non-native phonemes

VOWELS

Front  Near front  Central  Near back  Back

Close  i • y ——— i • u ——— u
Near close
Close mid  e • ø ——— e • ø ——— ø • y • o
Mid
Open mid  e • ø ——— ø • ø ——— œ • y • o
Near open
Open  a • a ——— a • a ——— a • a

Vowels at right & left of bullets are rounded & unrounded.

Non-Native Phonemes

- Non-native consonants (An et al., 2013)
- Consonant discrimination with training (Tamminen et al. 2015)
- Non-native French vowels (Gottfreid, 1984 and Levy and Strange, 2008)

<table>
<thead>
<tr>
<th>Vowel pair</th>
<th>F</th>
<th>Subject group†</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>/i, e/</td>
<td>4.40</td>
<td>3.50</td>
<td>5.60</td>
</tr>
<tr>
<td>/e, η/</td>
<td>1.40</td>
<td>2.10</td>
<td>3.05</td>
</tr>
<tr>
<td>/e, a/</td>
<td>0.10</td>
<td>0.30</td>
<td>0.25</td>
</tr>
<tr>
<td>/a, o/</td>
<td>5.70</td>
<td>4.90</td>
<td>5.25</td>
</tr>
<tr>
<td>/o, η/</td>
<td>3.30</td>
<td>3.90</td>
<td>4.20</td>
</tr>
<tr>
<td>/u, y/</td>
<td>0.60</td>
<td>2.50</td>
<td>3.85</td>
</tr>
<tr>
<td>/y, o/</td>
<td>2.30</td>
<td>4.20</td>
<td>6.30</td>
</tr>
<tr>
<td>/ø, η/</td>
<td>5.20</td>
<td>4.80</td>
<td>4.30</td>
</tr>
</tbody>
</table>

†F = native French; FA = French-speaking American; A = non-French-speaking American.
Models Of Speech Perception

- **PAM (Best, 1995)**

- **PAM L2 (Best and Tyler, 2007)**
  - According to PAM and PAM-L2 the ability of non-native listeners to perceive and accurately differentiate between non-native phonemes is based on the similarity between native and other non-native phonemes to the phoneme heard (Best and Tyler, 2007).

- **Speech Language Model (Flege, 2007)**
  - According to SLM, the creation of a new category for a non-native phoneme depends on how different the phoneme is from the original L1 sound. Phonetic category formation in the L2 according to SLM is being able to put sounds into the same category despite irrelevant auditory differences and being able to distinguish that sound from other categories despite commonalities.
Research questions

Can English speakers with and without French experience accurately identify French vowels?

Do French takers show better identification of French Vowels than non-French takers?

Which vowel contrast is hardest for French takers versus non-French takers?

Vowels being studied: /ø/ and /y/
Hypotheses

H₀: The participants will perform at chance. There will be no significance from the test.
H₁: French takers and non-French takers will perform above chance but there will be no difference between the performance of the groups.
H₂: French takers will perform better than non-French takers overall.
H₃: French takers and non-French takers will find different contrasts difficult to identify correctly.
Methods

- There were two versions of the study, an in person and online version.
- Both consisted of a set task in which participants listened two 30 vowel pairs consisting of the vowels /ø/, /y/, /u/, and /o/ in a CV.
- IPA was used in the task.

1) /ø/
   1 or 2
Recruitment

- Recruitment process
- Exclusion criteria
- Benefits
- Ages 12-18
- Participants 46

All participants were either currently taking French, Spanish, or not taking a language currently but had studied French or Spanish.
Analysis and Results

- Participants grouped based on language studied; French and non-French
- The average raw score for non-French takers was 20.8 (69% correct) whereas the average score for French takers was 20.4 (68% correct)
- T-test used to evaluate whether there was a significant difference between the groups performances
- Chi-squared test did show some relationship between vowel and group
Score Distribution of All Participants

French Takers Score Distribution

Non-French Takers Score Distribution
Percentage Correct by Vowel Pair

Percentage Correct by Consonant Type
Gottfried (1984) and Levy and Strange (2008) findings versus my findings

/u-y/ contrast may have been better for non-French takers due to their Spanish experience

No significant consonant context effect, however there was a link between language studied and vowel contrast

Methods differed

Age difference between groups

Phonemic awareness training
Limitations

- No Native French speakers
- Small sample size because sample had to be divided into two groups
- New methods
- Stimulus all from one person
Further Research

- In the future I would like to:
  - ERP study
  - More participants
  - Training task
  - French speaking control group
  - Category goodness
Conclusions

- Middle school and high school experience is insufficient to learn non-native vowels
- Further research into training students to recognize novel contrasts is needed
Acknowledgments

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Bibliography


