I. Introduction

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

Neurolinguistics

Neurolinguistics is the study of the neural processes underlying language production and comprehension.
- ToOLS of Neurolinguistics:
  - MMN
  - ERP
  - EEG

II. Review of Literature

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

Models of Speech Perception

PAM (Best, 1995)
- 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 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 able to put sounds into the same category despite irrelevant auditory differences and being able to distinguish that sound from other categories despite commonalities.

Discussion

- Gottfried (1984) and Levy and Strange (2008) findings versus my findings
- Any contrast may have been better for non-native 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

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VIII. Bibliography


III. Research Questions

1. Can English speakers with and without French experience accurately identify French vowels?
2. Do French takers show better identification of French Vowels than non-French takers?
3. Which vowel contrast is hardest for French takers versus non-French takers?

IV. 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.

V. Methods

Methods

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

Recruitment

- Recruitment process: email, posters, and asking people to sign up
- Exclusion criteria: L1 English, and native English speaker
- 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

VI. Analysis and Results

Analysis

- 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 performance
- A chi-squared test was used to test for a correlation between group and accuracy in discriminating by vowel contrast pair and consonant

Results

- No significant difference between groups scores
- Chi-squared test did show some relationship between vowel and group
- Some questions were significantly more difficult for either group
Perception of Non-Native Phonemes by Native English Speakers