Perceptual Frequency and Formant Frequency in R speech
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Variation in surface form patterns with many factors.

Patterns get transmitted from speaker to speaker.

How? Patterns of Perceptual Frequency are supported by Formant Frequency.

Which acoustic aspects are relevant?

Connections between Perceptual Frequency and Formant Frequency.

References

http://www.dean.richardson.virginia.edu/ln/lg131.html

Auditory

56 speakers from Boston and southern New Hampshire were digitally recorded reading a light-hearted story containing 224 words with pre-voiced /r/. Environments were categorized according to morphological position, phonological context, and the interesting factors of word class (function/lexical), vowel length, and spectral frequency. Two coders listened to each token a number of times and coded it as /r/ or [r] (neutral to intermediate). Factors were submitted to multivariate logistic regression analysis. All linguistic factors except word class proved significant, by perceived [r] vs. /r/ in the independent variable. Social factors, including age, sex, ethnicity, education, location, and income were also significant.

Acoustic

Data for 20 of the speakers (10 White, 10 African-American, all Bostonian) and 20 words of similar lexical frequency and containing /r/ or [r] in a stressed syllable were collected from another context, e.g., "often," "could" were measured. Formant at various points and duration of the /r/ were also measured. All variables were measured for each speaker, and the independent variables above. Similar patterns of significant effects were found in the lexical and social approaches.

Method

Data collection: Reading passage

People in [r] were asked to produce the true word and to provide a text aloud through a human–computer interface. Three short stories. Written and audial versions of the same. Both stories followed the story, "Ruth," read aloud at the same rate. The participants were to be blind to the experimenter's purpose.

Participants:

- 56 speakers from Boston and southern New Hampshire: Male: 28; Female: 28; Age: 18-74; Education: College: 22; High-school: 34; Adult learners: 0

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Exemplar Theory predicts more constriction in:

- Speakers who delete more often.
- Social groups who delete more often.
- Words that have a higher % [r].
- Certain linguistic environments (untestable with these data).
- Examined New Zealand intrusive [r].
- Found greater constriction in contexts that favor [r].
- This study supports their findings.