A Phonetic Basis for the Sonority of [χ]
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Question
- What is special about voiceless fricatives that allows them a privileged, “high sonority” phonotactic position in language?
- Are phonotactics governed by perceptual properties of sequences?

Hypothesis
- Speakers can use coarticulatory cues to recover information about a preceding stop better before [χ] than before other fricatives (e.g. [f]).
- The long front cavity in front of the [χ] constriction yields a clearer formant structure (Fig. 1).

Experiment
Is the sonority of [χ] the result of abstract or perceptual properties?

Method:
- AX burst- detection task
- 500 ms ISI
- 420 trials
- 19 native English participants (18 female)

Stimuli:
- Recorded by native French speaker
- Syllables of shape tCV, where F = {f, χ, l}, V = {a, e, i, o, u}
- Each syllable gave two stimuli: one left intact, the other had the t-burst removed (Fig. 2)

Results
- Speakers have low but significant sensitivity to burst presence before [f] but not [χ]
- Native English speakers are significantly more sensitive to the presence of a burst before [f] than before [χ].
- Non-native speakers show a different behavior and may be attending to different cues.

Discussion and Conclusions
- Listeners are better able to infer presence of a stop despite the absence of a burst before [χ] than before [f].
- A label like “rhoticity” is not required for explaining the phonotactics of [χ] in French.
- These results make predictions for the phonotactics of other back fricatives.

Selected References

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