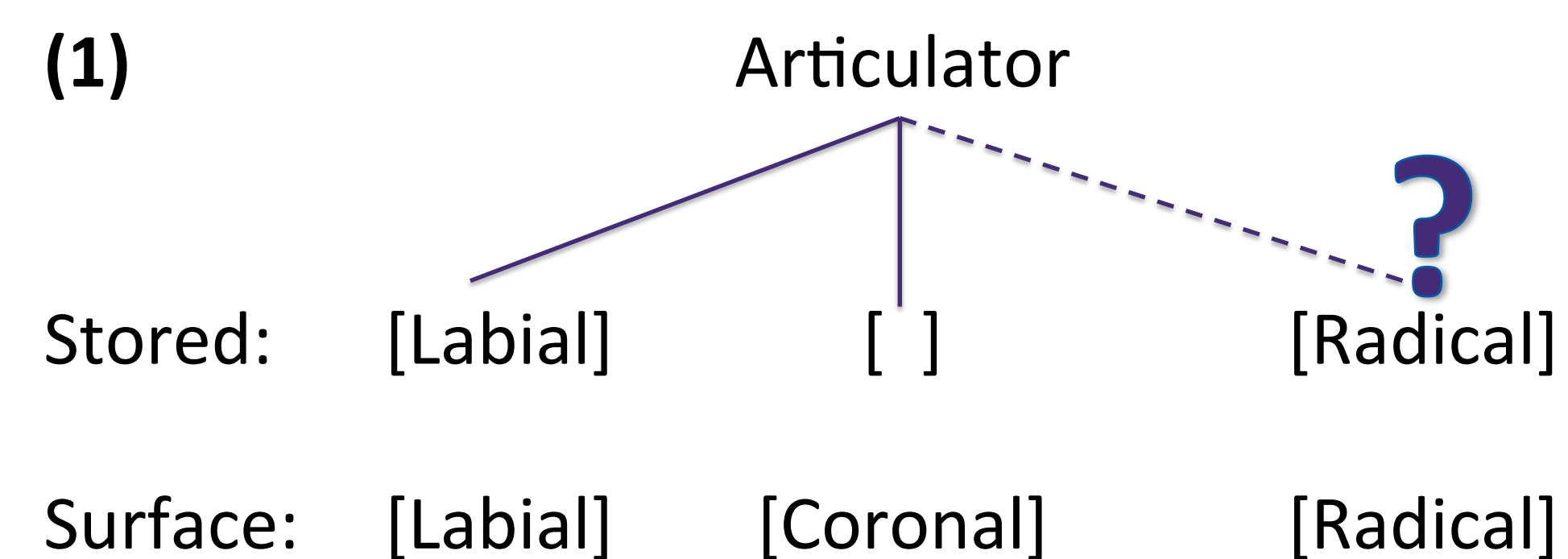


Introduction

- Phonological features may have neural correlates which are sensitive to underspecification.
- There is an early ERP component is sensitive to differences between most, but not all, categories.
- The Featureally Underspecified Lexicon (FUL; Lahiri and Reetz 2002, 2010) model uses underspecification (Archangeli 1988) to explain why strong differences are asymmetrically detected between, e.g., coronals and labials.
- Features specified at the surface may be unspecified when stored.
- Phonologically underspecified features evoke little or no difference with specified features, but specified features may conflict and evoke large MMN waves.
- Surface Stored
[Coronal] → [Labial] = Mismatch
[Labial] → [∅] = Nomismatch
- Coronal underspecification (Avery and Rice 1989) is supported by FUL.
- Laryngeals (i.e. [h]) are another type less specified articulation: no place (Goldsmith 1981, Clements 1985, McCarthy 1988)
- FUL suggests a radical place for glottals (Lahiri and Reetz 2010).

Aim of Study

- Test FUL for *coronal* and *labial* fricatives ([s], [f]).
- Extend FUL for laryngeal segments: [h].



References

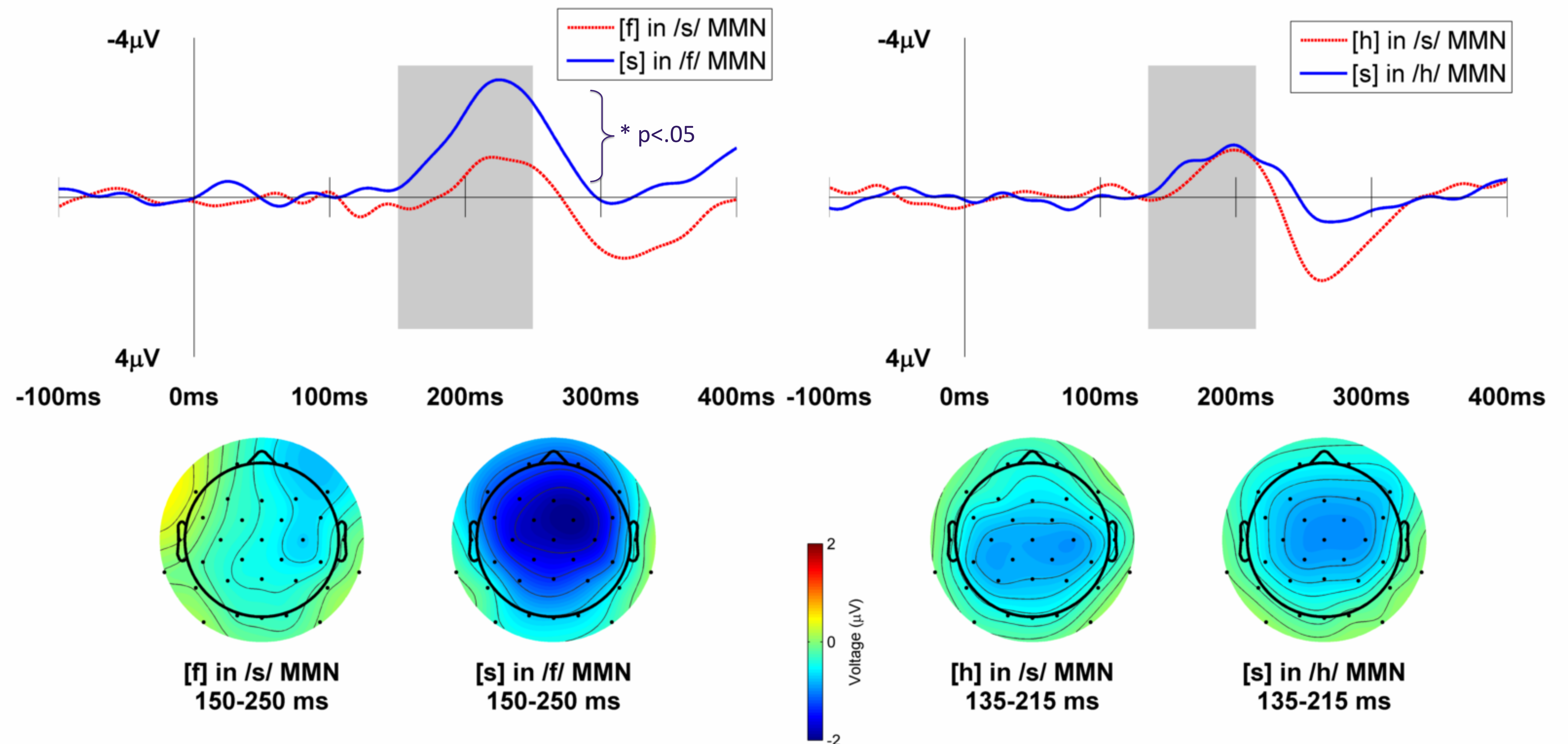
Avery, P., & Rice, K. (1989). Segment structure and coronal underspecification. *Phonology*, 6(2), 179–200.
 Archangeli, D. (1988). Aspects of underspecification theory. *Phonology*, 5(2), 183–207.
 Beckman, J., Helgason, P., McMurray, B., & Ringen, C. (2011). Rate effects on Swedish VOT: Evidence for phonological overspecification. *Journal of Phonetics*, 39(1), 39–49.
 Clements, G. N. (1985). The geometry of phonological features. *Phonology Yearbook*, 225–252.
 Goldsmith, J. (1981). Subsegmentals in Spanish phonology: An autosegmental approach. In *Linguistic Symposium on Romance Languages* no (Vol. 9, pp. 1–16).
 Lahiri, A., & Reetz, H. (2002). Underspecified recognition. *Laboratory Phonology*, 7, 637–675.
 Lahiri, A., & Reetz, H. (2010). Distinctive features: Phonological underspecification in representation and processing. *Journal of Phonetics*, 38(1), 44–59.
 McCarthy, J. J. (1988). Feature geometry and dependency: A review. *Phonetica*, 45, 84–108.
 Ringen, C., & van Dommelen, W. A. (2013). Quantity and laryngeal contrasts in Norwegian. *Journal of Phonetics*, 41(6), 479–490.

Methods, Data Collection, Analysis

- | | | | |
|--|---|---|---|
| (2) Deviant[f] in Standard /s/
/s/ /s/ /s/ /s/ [f]
[] [] [] [] [Lab]
Nomismatch | (3) Deviant [s] in Standard /f/
/f/ /f/ /f/ /f/ [s]
[Lab][Lab][Lab][Lab][Cor]
Mismatch | (4) Deviant [h] in Standard /s/
/s/ /s/ /s/ /s/ [h]
[] [] [] [] [?]
Nomismatch | (5) Deviant [s] in Standard /h/
/h//h/ /h/ /h/ [s]
[?] [?] [?] [?] [Cor]
??? |
|--|---|---|---|

- Subjects: 24 right-handed subjects (9 female), monoling.English speakers or early bilinguals.
- Stimuli: 5 tokens each of [f], [s], and [h], 300ms in duration. 1000 standards and 150 deviants in four blocks: [f]_{/s/}, [s]_{/f/}, and [h]_{/s/}, [s]_{/h/}.
- Procedure: Oddball paradigm, 2-10 standards for each deviant, 32-channels.
- Analysis: Offline data processed with .05-30Hz bandpass filter. Epochs (500ms) with voltage over ±80µV were rejected. Each participant had over 60 deviants in the analysis.

Results



Difference waves (at Fz) and topographic plots of MMN for each segment (average of deviant trials, minus average of that segment's standard trials from other block).

Discussion

- Deviant coronals elicit a larger MMN in a labial (i.e. specified) context than labials in a coronal (i.e. underspecified) context, as predicted by FUL.
- Deviant coronals do, however, not elicit a large MMN in a laryngeal context (i.e. nomismatch) nor do laryngeals elicit a large MMN in a coronal context.
- The phoneme /h/ does not have a stored place of articulation or articulator on-par with /f/: a [Radical] or [Laryngeal] feature is either underspecified when stored, or represented on an orthogonal tier or branch.
- Fricatives without vocalic context may be useful in testing the predictions of FUL since they do not require a vocalic context like stop consonants.

Special thanks to Kate Coughlin and Nick Kloehn for stimulus recording.

Further Research

- [f] vs [h] contrast could demonstrate presence of surface [Radical] Feature.
- Intervocalic context may replicate findings.
- Contrastive overspecification (Swedish and Norwegian stops; Beckman et al. 2011, Ringen and van Dommelen 2013) and other laryngeal contrasts (Hindi/Urdu).
- Pharyngeal and pharyngealized segments (Arabic).
- Coronal features in English, Arabic, Tamil, and Malayalam.