What does varying the standards in an MMN paradigm really do?

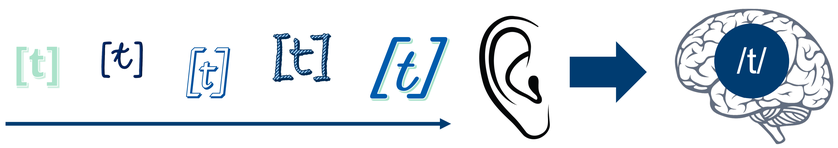
Funded by
NSF DDRI Linguistics
Grant Number: 2041266

Chao Han[1], Ryan Rhodes[2], William Idsardi[3], Arild Hestvik[1]

[1]Department of Linguistics and Cognitive Science, University of Delaware; [2]Center for Cognitive Science, Rutgers University; [3]Department of Linguistics, University of Maryland

Background

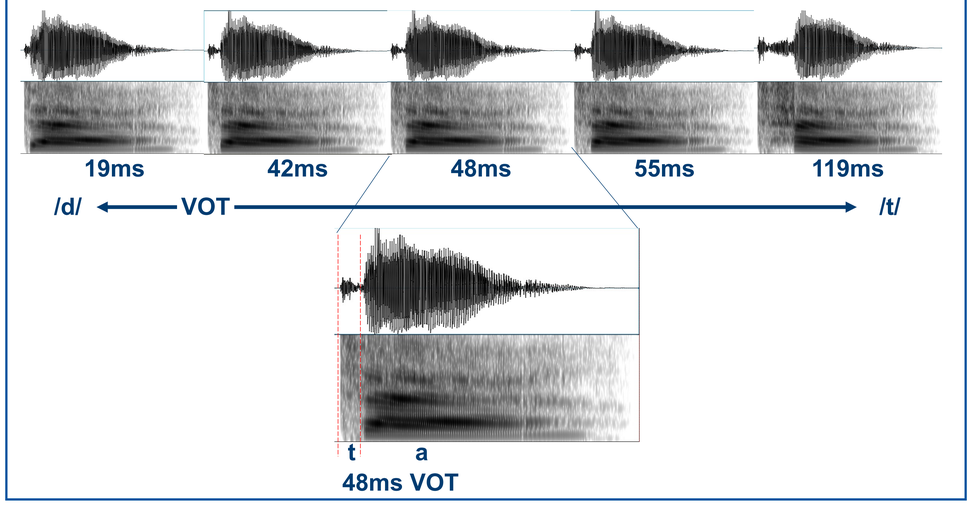
- MMN reflects a difference between a deviant and the memory trace of standards.
- The "various-standard" oddball paradigm: Varying standards belonging to the same category elicits a categorical representation.
- When standards are [ta]s with different VOTs, the elicited categorical representation is the phoneme representation /t/ [1].



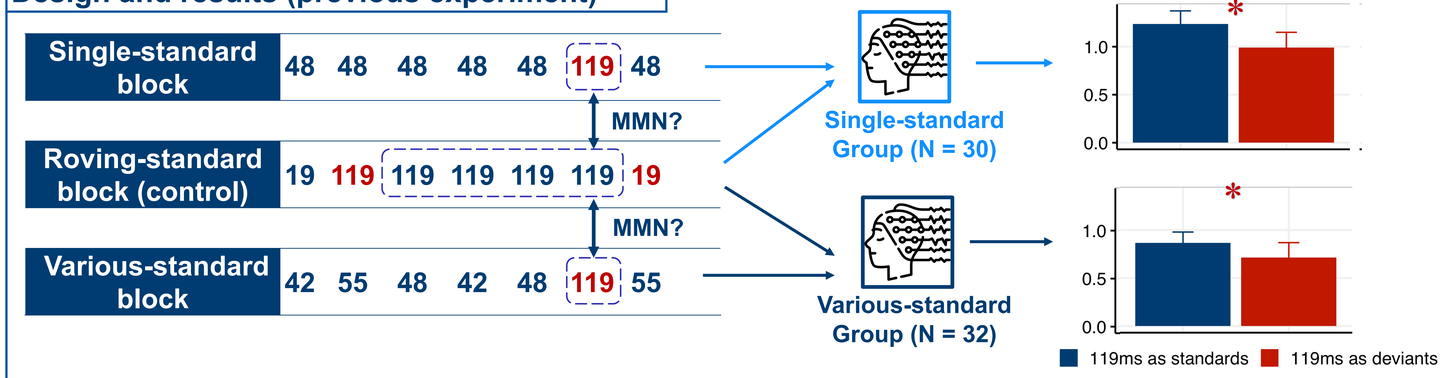
- ***Does the memory trace contain only a phoneme representation?***
- Studies adopting this paradigm have assumed that varying the standards precludes an acoustic MMN [2,3].
- Our lab found a within-category MMN that relies on acoustic details:

Previous experiment (for details, see Poster B26)

Stimuli: /d-t/ continuum [4]

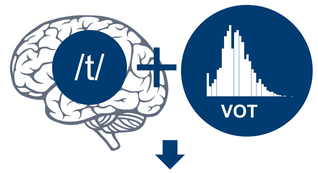


Design and results (previous experiment)



Within-category MMN found. But where does this within-category MMN come from?

Acoustic account: The memory trace in various-standard paradigm still contains fine-grained acoustic information.

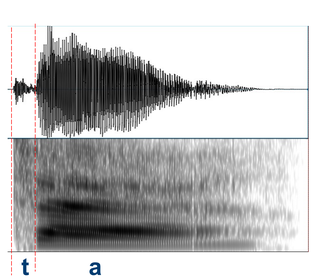


The acoustic information is a statistical summary of the presented stimuli [5].

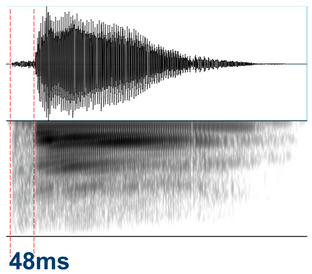
Phonetic account: The phoneme representation itself contains phonetic information (~60ms) [6].

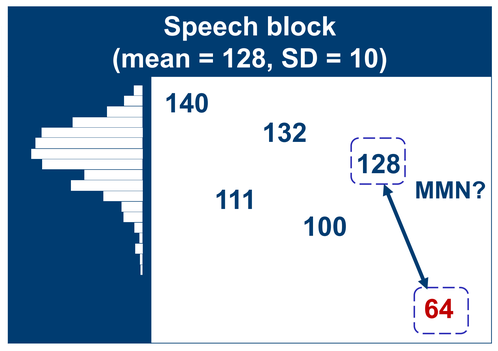
The phonetic information is from long-term memory and is insensitive to the presented VOT.

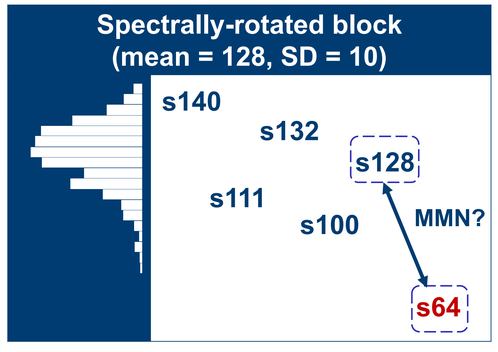
Planned experiment



spectral rotation







Predictions