The Effect of Voice Familiarity on Attention to Speech in a Cocktail Party Scenario

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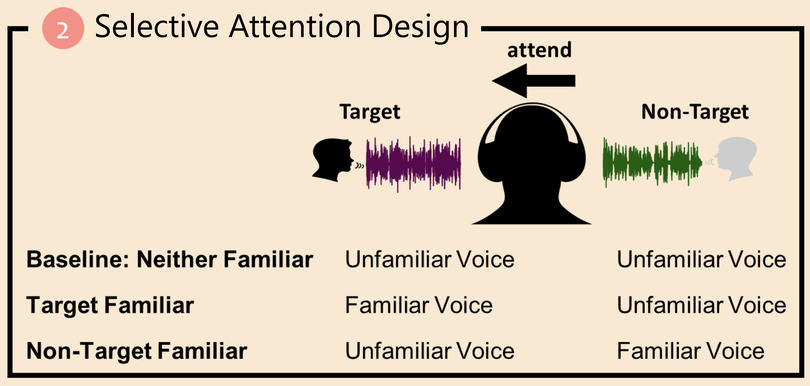
BACKGROUND

Understanding speech in multi-speaker environments can be difficult, due to the competition for processing resources. In such 'Cocktail Party' scenarios, top-down attention operates to selectively amplify one voice ('to-be-attended') and suppress other competing voices. This selection may be affected by acoustic and semantic properties of the voices themselves. Here we focus on an ecologically important feature of human voices – *familiarity* – and ask how it affects the ability to attend-to or ignore speech in Cocktail Party scenarios.

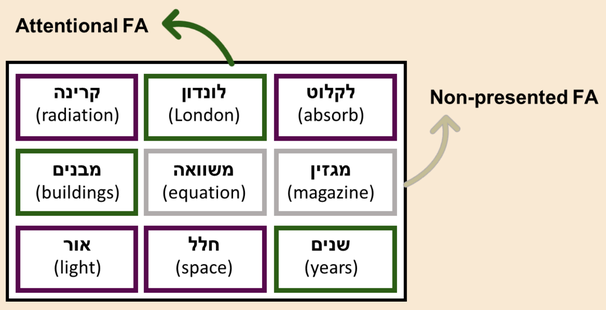
EXPERIMENTAL DESIGN

1. Familiarization Process: over 1 week ,at home
2. Selective Attention Design

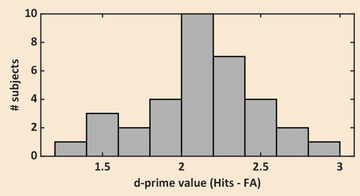


MEG experiment
N = 34

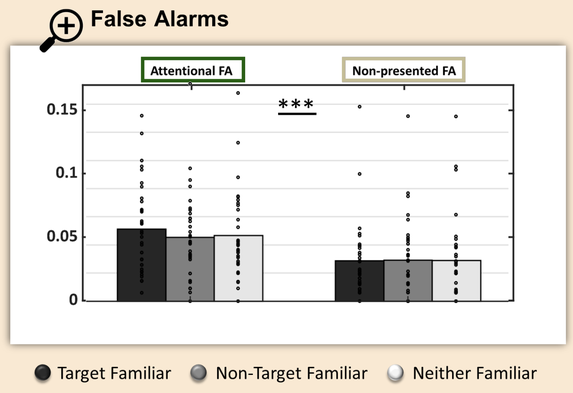
Word Recognition Task



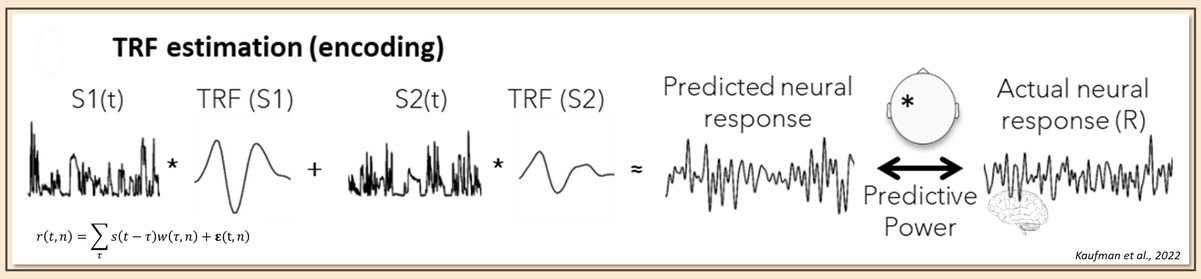
BEHAVIORAL RESULTS



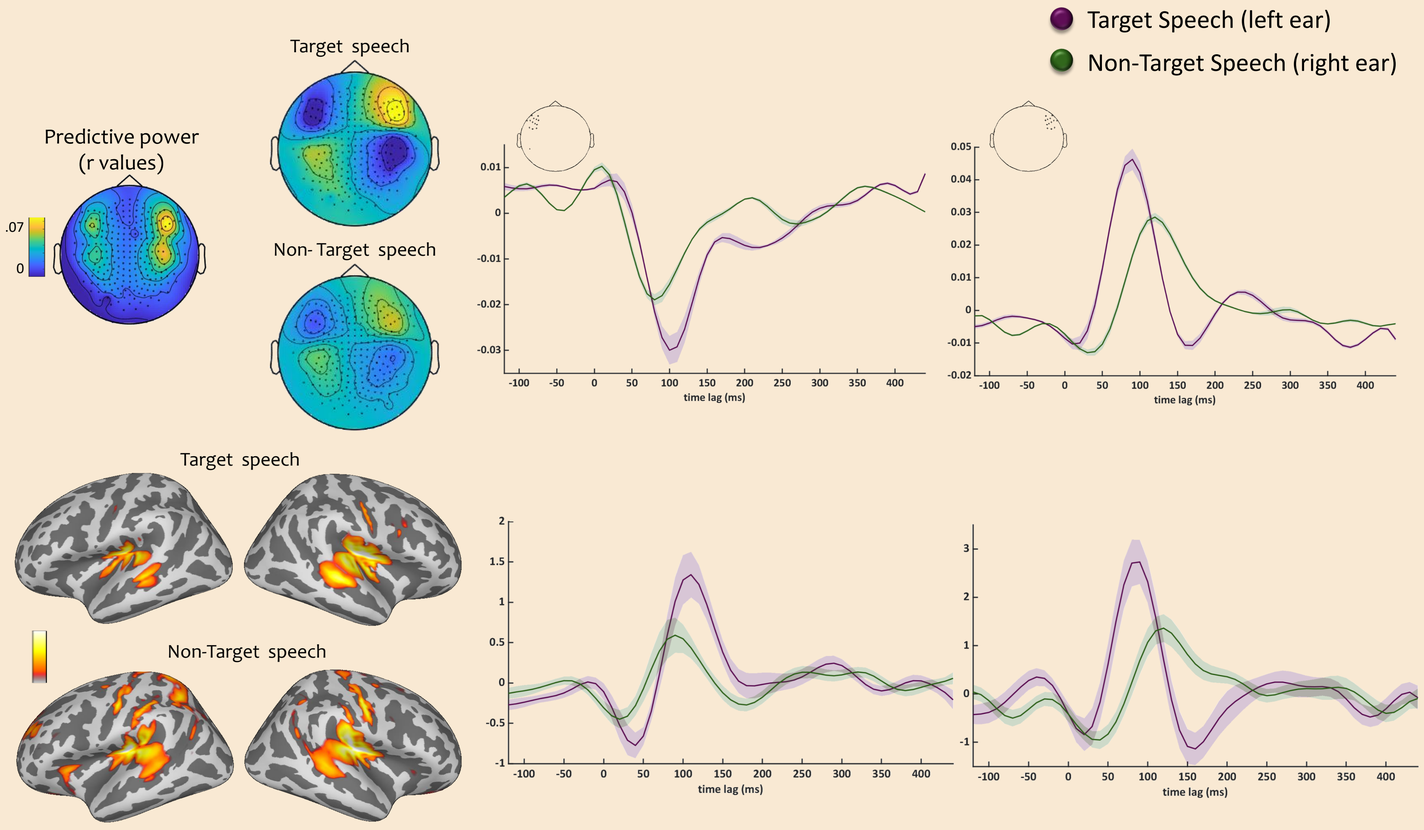
Behavioral evidence for **semantic interference** with target speech processing.



SPEECH TRACKING ANALYSIS

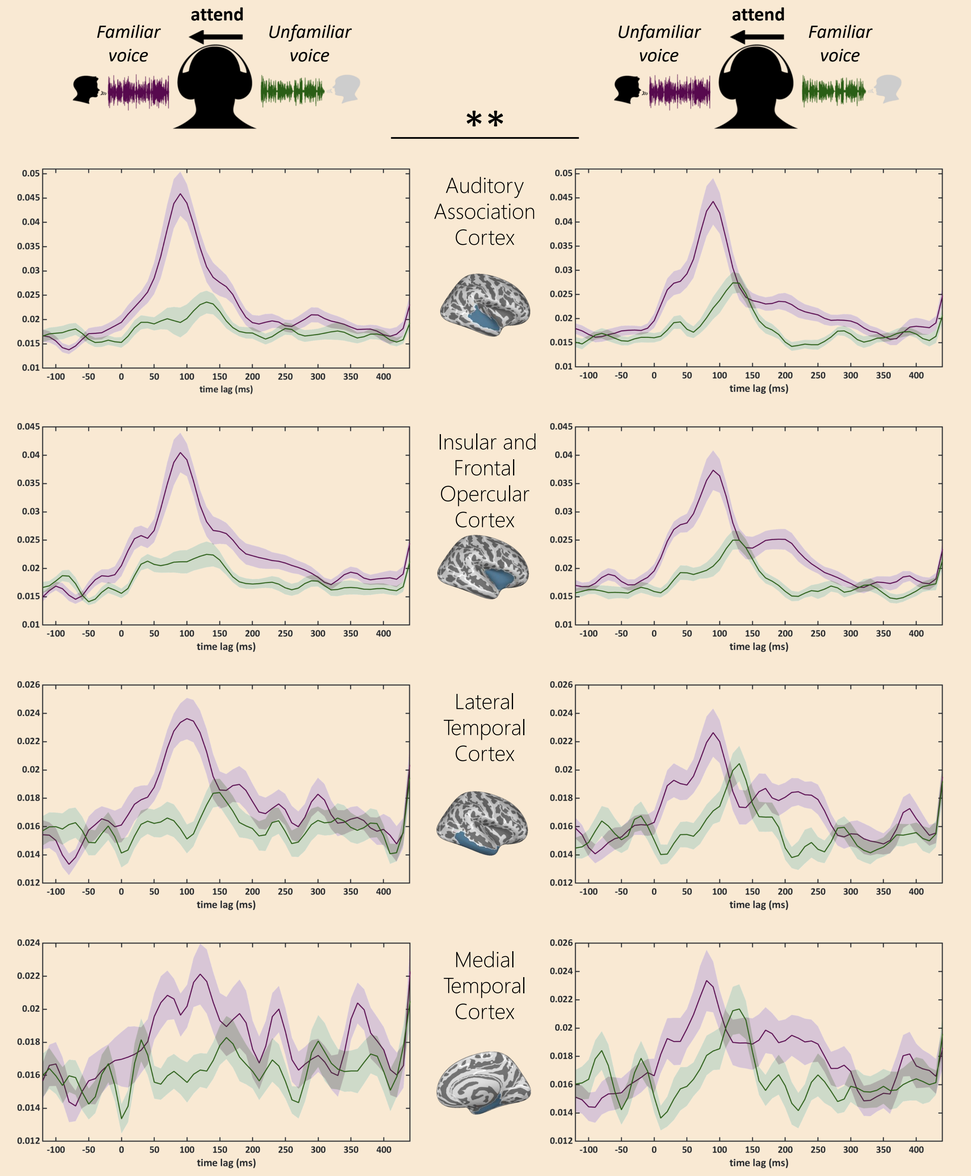


The Basic Attentional Effect



Attentional Selectivity: Increased speech tracking for target speech in auditory regions. Faster speech-tracking in contralateral hemisphere.

Voice Familiarity Effect on Attention



Increased speech tracking response for non-target speech **when it is in a familiar voice.**

CONCLUSIONS

We replicate previous findings showing enhanced neural response to target speech compared to non-target speech, reflecting top-down selective attention. However, this effect was modulated by voice familiarity, and attentional-suppression was reduced for non-target speech in a familiar voice. This effect was present in secondary, but not in primary auditory regions, suggesting a hierarchical selection process.

In early auditory cortex:
Speech Tracking but no Familiarity Effect