

Voice
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Conference Programme

Marburg
28. - 30. August 2024

3:25pm - 3:45pm

ID: 150

Abstract

Keywords: voice identity discrimination, neural entrainment, comparative, EEG, fast periodic auditory stimulation

Fast periodic auditory stimulation EEG reveals recent-over-ancient tuning effects on voice identity processing in dogs and humans

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Voices of conspecifics, typically the most relevant social partners, are processed preferentially in many species' brains. This processing preference may reflect either ancient or more recent tuning to a socially relevant stimulus class. To disentangle these accounts, the special interspecific relationship of dogs and humans provides an ideal study case: for dogs, that are not only selected to communicate effectively with humans but also live with them, human vocalizations may have recently gained greater social relevance than anciently relevant conspecific vocalizations; and among humans, dog vocalizations may be more relevant to dog owners than non-owners. In a fast periodic auditory stimulation-based EEG study, we presented dogs (N=16) and humans (N=21) with continuous, rhythmically patterning vocalization streams (dog/human): every third sound differed in vocalizer identity. We found that both dog and human brains detected human voice identity changes more efficiently, despite that dog and human voices were acoustically similarly discriminable. Dog owners, however, did not outperform non-owners. Recent relevance may thus outweigh ancient preferences in voice identity processing, but individual experience with a vocalizer species does not necessarily improve identity discrimination abilities.

Session 3: Voice Perception

Time: Wednesday, 28/Aug/2024: 4:15pm - 5:45pm · *Location:* Main Conference Hall (001)

Session Chair: Volker Dellwo

4:15pm - 4:45pm

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Invited Talk

Prototype theory and acoustic variability in voice perception

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In general terms, prototype models of speaker recognition assert that voices are recognized (or learned, or remembered) with reference to an abstract voice sample that is average for the population (or the individual, or the entire universe of voices), or else to a sample that sounds very ordinary/not at all distinctive. This model has existed for many years, and many variants of this basic framework have emerged. In this paper I will attempt a comprehensive review of prototype models, covering definitions of a prototype, what a prototype is intended to explain, the data to be modeled (perceptual? acoustic?), the domain of averaging (single voice? population of voices?), experimental results that support the concept, and other details. This review will be framed in context of recent findings regarding the nature and extent of acoustic variability within and across speakers. It is hoped that this review will clarify the state of prototype models in voice studies and bring some order to what is a tantalizing but somewhat muddled set of concepts.

4:45pm - 5:15pm

ID: 161

Invited Talk

Memory for voices and individual differences

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The ability to recognize others by their voice ranges from phonagnosia to super-recognition. To understand the neural mechanisms and individual differences underlying voice memory, we conducted a series of studies using recognition memory paradigms. Results suggest the rapid acquisition of voice representations after minimal voice exposure to brief sentences. In the EEG, learned – compared to novel – voices elicited a suppression in beta-band oscillations from ~300 ms independent of speech content, indicating the detection of learned speaker identities across novel utterances. In fMRI, explicit voice recognition independent of speech content recruited both voice-sensitive cortex areas of the right superior temporal gyrus and extra-temporal areas. In terms of individual differences, we observed higher recognition performance for young vs. older adults, and a general recognition advantage for old adult voices. Finally, to assess individual differences in voice memory, we developed and validated the Jena Voice Learning and Memory Test (JVLMT), a standardized and freely available research tool, based on item-response theory. Its format is broadly analogous to the Cambridge Face Memory Test. The JVLMT is suited to screen for phonagnosia and super-recognition abilities within ~22min and is applicable across languages due to the use of pseudo-speech. As an outlook, we aim at refining the JVLMT to discriminate within the upper and lower ability spectrum and plan to develop further tests to assess various objective and self-reported aspects of voice memory and voice cognition. Prospectively, these tools can inform both researchers into individual differences and clinicians about the effectiveness of interventions in hearing-impaired patients.