Voice discrimination

Studies of brain-damaged subjects indicate that recognizing a familiar voice and discriminating among unfamiliar voices may be selectively impaired, and thus that the two are separate functions. Familiar voice recognition was impaired in cases of damage to the right (but not the left) hemisphere, while impaired unfamiliar voice discrimination was observed in cases with damage to either hemisphere [1].

Iannotti et al. combined psychophysics, voice-morphing technology, and high-density EEG in order to identify the spatiotemporal patterns underlying self-other voice discrimination (SOVD) in a population of 26 healthy participants, both with air- and bone-conducted stimuli. They identified a self-voice-specific EEG topographic map occurring around 345 ms post-stimulus and activating a network involving insula, cingulate cortex, and medial temporal lobe structures. Occurrence of this map was modulated both with SOVD task performance and bone conduction. Specifically, the better participants performed at SOVD task, the less frequently they activated this network. In addition, the same network was recruited less frequently with bone conduction, which, accordingly, increased the SOVD task performance. This work could have an important clinical impact. Indeed, it reveals neural correlates of SOVD impairments, believed to account for auditory-verbal hallucinations, a common and highly distressing psychiatric symptom [2].

1)
Van Lancker D, Kreiman J. Voice discrimination and recognition are separate abilities. Neuropsychologia. 1987;25(5):829-34. doi: 10.1016/0028-3932(87)90120-5. PMID: 3431677.
2)
Iannotti GR, Orepic P, Brunet D, Koenig T, Alcoba-Banqueri S, Garin DFA, Schaller K, Blanke O, Michel CM. EEG Spatiotemporal Patterns Underlying Self-other Voice Discrimination. Cereb Cortex. 2021 Oct 15:bhab329. doi: 10.1093/cercor/bhab329. Epub ahead of print. PMID: 34649280.