Electrophysiological indices of self versus other's voice discrimination

Jérôme Graux[1], Marie Gomot*[2], Sylvie Roux[2], and Nicole Bruneau†[2]

[1]UMRS INSERM U930 - Centre de Pédopsychiatrie CHRU de Tours - Univ François Rabelais de Tours – CHRU de Tours 37044 Tours cedex, Armenia

[2]UMRS INSERM U930 - Centre de Pédopsychiatrie CHRU de Tours - Univ François Rabelais de Tours – Inserm : U930 – France

Abstract

Self- and other- representations are crucial to social functioning. The exploration of neural basis of self-representation has focused on recognition of self-face, the most embodied representation of the self. Other forms of self-recognition, such as recognition of one's own voice, have received less research attention despite many electrophysiological and neuroimaging studies demonstrating the existence of specific neurophysiological processes involved in voice processing. The present study examines the neural processes underlying own voice discrimination using electrophysiological methods. Event-related potentials from 64 electrodes were recorded while healthy subjects (n = 17) heard passively an oddball sequence constituted of recorded French vowel /a/ pronounced either by the participant her/himself or by unknown persons. All stimuli were presented so that each stimulus was alternately standard or deviant. The MMN and P3a features (amplitude, latency, and scalp potential and scalp current density topography) evoked by the subject's own voice were significantly different from those evoked by unknown voices. The results indicated an early detection of own voice (pre-MMN to own-voice) and an attentional switch towards "others" i.e. unknown voice (greater P3a amplitude). Moreover own voice discriminative response involved a left inferior frontal component, the activity of which lasted throughout the time course of the discriminative response, which included both MMN and P3a. Our findings therefore provide arguments for automatic attention modulation processes privileging attention toward others' voices rather than one's own voice which is the basis of adapted communication.

*Speaker

†Corresponding author: nicole.bruneau@univ-tours.fr