Name recognition in autism: EEG evidence of altered patterns of brain activity and connectivity

Names processing in autism spectrum disorder (ASD) has rarely been studied despite the fact that impaired orienting to social stimuli is one of the symptoms of ASD. Here, we investigated brain activity and functional connectivity associated with recognition of names (own, close-other's, famous, unknown) in ASD and control groups. EEG data were recorded and analyzed with event-related potentials (ERP), event-related synchronization and desynchronization (ERD/S), coherence, and directed transfer function (DTF) methods. In individuals with ASD, P300 (a positive ERP component) to own-name and to a close-other's name were similar. In control participants, P300 to own-name was enhanced in comparison to all other names. Lower alpha suppression and weaker beta and theta synchronization were found in the ASD group for all names. Coherence and DTF revealed disruption of fronto-posterior task-related connectivity in individuals with ASD within the beta range frequencies, mainly for connections going from posterior to anterior regions. Moreover, DTF showed inter-group differences in short-range connectivity: stronger connections within the frontal region in the control group and stronger connections within the parietal-occipital region in the ASD group. Our findings suggest a lack of the self-preference effect and impaired functioning of the attentional network during recognition of visually-presented names in individuals with ASD.