

Associations of self-focus attention to oscillatory dynamics of self-recognition in morphed images

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Motivation and Aim: Recognizing one's own face is a unique, complex process related to basic processes of self-awareness [1]. Self-focus has attracted the attention of researchers as an important trait predisposing to affective disorders [2, 3]. In this study, using the EEG recordings, we aimed to investigate the associations between the focus of attention on the self and the oscillatory dynamics accompanying the processes of recognizing morphed images consisted of self and stranger faces.

Methods: Forty-nine volunteers (30 females) between the ages of 18 and 42 participated in the study. Study participants completed the Self Consciousness Scale [4, 5], which contains the Private Self-Consciousness and Public Self-Consciousness/Social Anxiety subscales. During the 127-channel EEG recording, subjects were randomly presented morphed images of their own face with the face of a stranger. The face of a stranger of the same sex and similar attractiveness was selected from the NimStim Set of Facial Expressions database. It was needed to choose 1 of 2 options whether the person recognized himself or not in the morphed image by pressing the corresponding buttons. The stimulus presentation program was designed to select a morphing stage during testing at which the probability of recognizing oneself or the other was equal. Spearman correlation analyses were conducted at a significance level of $p < 0.005$ for the Private Self-Consciousness and the Public Self-Consciousness/Social Anxiety subscales with each point of the time-frequency resolution of event-related spectral perturbations separately for the conditions when the participant recognized him/herself and in the condition when he/she did not.

Results and Conclusion: In the condition of not recognizing oneself in the morphed image, the Private Self-Consciousness subscale was positively related to delta rhythm synchronization. According to the literature on the relation of the delta rhythm increase in arousal and motivation states [6, 7], it could be assumed that in subjects with high scores on the Private Self-Consciousness subscale, the increase of delta synchronization could be related to the high level of arousal when perceiving morphed images of faces that do not seem like themselves.

In the self-recognition condition, the Public Self-Consciousness/Social Anxiety subscale was positively related to an increase of theta rhythm. Based on the data on the relations between theta rhythm and attention and memory processes [8, 9], it could be assumed that subjects with a higher score on the Public Self-Consciousness/Social Anxiety subscale in the condition of recognizing themselves in a morphed image pay more attention to details, inconsistencies, and distortions of their own face.

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