Poster Exhibition
(abstracts)

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Neurofeedback of the activity of the anterior cingulate cortex: absorption, schizotypy and attention networks

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Objective: Several studies have shown an important role of the anterior cingulate cortex (ACC) for states of absorption induced by hypnosis or meditation (e.g. Rainville et al., 2002). With the newly available technology of neurofeedback via MRI, the present study examines if subjects are able to regulate their ACC activity voluntarily and if states of absorption could be induced by this kind of self-regulation. Previous studies showed a substantial correlation between positive symptoms of schizotypy and absorption. In addition, absorption was found to be associated with better performance of attention networks for orienting and executive control. Therefore this technology could be relevant for schizophrenia research on attention deficits and training effects.

Method: Neurofeedback software: The software calculates a mean BOLD signal within a pre-selected 3d-mask in real-time. Before an actual experiment starts, an initial EPI measurement is necessary. The measured images are normalized (by means of affine and Discrete Cosine Transformations). Finally, the inverse of the gained transformation matrix is applied to the selected mask in order to transfer the mask from MNI space into the non-normalized, motion corrected individual space. This minimizes the calculation expense during the experiment. Neurofeedback study: The general aim of the actual research project is to compare the ability to increase ACC activity of two extreme groups, subjects with a high and low degree of absorption capacity. Until now we conducted a pre-study in which we where interested in the general feasibility of self-regulation of activity within the ACC.

Results: Preliminary results show that six of eight subjects achieved higher levels of activation within ACC in activation-conditions than in rest-conditions.