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Emotions under control: Managing emotions

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Several studies have shown that emotion regulation (ER) and its relationship to well-being should be characterized by at least four parameters: first by ER-effectiveness; second by the frequency at which a specific ER-strategy is utilized; third by its adaptiveness, and fourth by how flexibly ER is taking place. In my presentation, empirical findings with respect to the association between ER and well-being are shortly reviewed (first part). Based on these findings, we developed the group intervention “Managing Emotions: Emotions under control” (German: “Gefühle im Griff”), which systematically teaches participants specific emotion regulation strategies. Structure and content of the intervention program as well as preliminary results of efficacy (n=45) are presented in the second part of my talk.

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Fronto-temporal, fronto-parietal and bi-hemispheric coupling during auditory working memory in Schizophrenia

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Working memory (WM) deficit is a core cognitive dysfunction in schizophrenia (SCZ), though its underlying mechanism remains unclear. Long-range synchronization of neuronal oscillations is presumed to mark cognitive processing and facilitate information transfer among broadly separated brain regions. Theta, alpha and gamma range phase synchronization (PS) is thought to contribute during encoding, maintenance and retrieval phases of WM. Using a novel auditory WM paradigm, we used combined EEG and MRS measures to investigate the putative functional connectivity and neurochemistry in mediating the accuracy and performance during a modified N-Back test (MNB). SCZ patients (n=50) and matched healthy controls (HC, n=50) participated in the study. The MNB task requires rapid comparisons of subtly discrete tones held in memory while resisting the interference of previous tones. EEG recording during the MNB task was used to obtain phase locking values from time frequency data. To examine the contribution of synchronization by neurochemistry, GABA & glutamate were measured using standard techniques at the medial frontal/anterior cingulate. Behaviorally, SCZ and HC performed comparably during match trials [$F=0.865$, $p=0.356$]; however, SCZ made more errors during mismatch trials [$F=5.198$, $p=0.026$]. Reaction time (RT) was significantly reduced in SCZ during correct trials compared to HC ($F=3.253$, $p=0.077$). In contrast, HC had a shorter RT during incorrect trials ($F=7.855$, $p=0.007$) compared to SCZ. Higher glutamate levels were associated with increased accuracy in SCZ compared to HC [$r=0.548$, $p=0.002$]. In controls, there was increased bi hemispheric and fronto-temporal, fronto-parietal PS in the alpha frequency; Studies implicate alpha-theta activation for a phonological loop during WM tasks suggesting that SCZ rely heavily on this for accurate working memory. FT PS during auditory WM tasks is significantly impaired in SCZ and is robustly associated with frontal glutamate levels, whereas functions are significantly related to frontal GABA level in NC. Our finding highlights the role of neurochemistry in the fronto-temporal circuit abnormality in SCZ.

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