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Executive attention and pre-attentive neurocognitive mechanisms in schizophrenia

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Since working memory (WM) is considered a core mental deficit in both schizophrenia (SZ) and aging people suffering from dementia it is critical to dissect its underlying neurophysiological components in order to identify disease-specific mechanisms that can indicate prodromal phases in these different clinical conditions that occur during different developmental stages across the life span. In support of utilizing Meiron et al's (2013) executive attention (EA) task to identify specific prefrontal mechanisms associated with SZ, in a previous study in SZ patients, we observed that WM accuracy scores obtained from the EA task significantly to clinical classification. The WM task was considered to index dorsolateral prefrontal cortex (dLPFC) activity and EA, which are known to be abnormal in people suffering from psychotic disorders and neurodegenerative disorders. In the current investigation, by employing a more cognitively demanding version of Meiron et al's (2013) EA task, we examined pre-attentive auditory function indexed by mismatch negativity (MMN) event-related potentials (ERP's). Preliminary findings indicated a unique relationship between pre-attentive neurophysiological activity and goal-oriented executive top-down performance. Only in the SZ group, MMN amplitudes were significantly related to verbal WM scores. In addition, failure in EA was sensitive to differences in psychosis severity. WM accuracy scores were significantly related to the severity of negative symptom. Critically, extending Meiron et al's (2013) findings, WM accuracy and reaction times were both significantly impaired in SZ versus healthy controls revealing that both psychomotor processing and executive attention DLPFC activity are significantly reduced in schizophrenia versus healthy controls.

Biography

Oded Meiron completed his PhD in psychology (emphasis on behavioral cognitive neuroscience) on 2011, and since them has worked as a postdoc neuroscientist at Bar Ilan University (Israel) and Columbia University (NY, New York). He has been working as the Head of the Electrophysiology and Neurocognition lab at Herzog Medical Center (HMC) within the clinical Research Center at the HMC (since 2013) and is the director of the Non-invasive brain Stimulation Clinic at Herzog Medical Center (since 2017).

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