ABSTRACT

The experiments comprising this dissertation sought to contribute to the understanding of basic sensory processing in schizophrenia-spectrum disorders and risk-liability. We leveraged the sensitivity of visual processing deficits along with the widely reported sensory-gating deficits (in other modalities) to develop a new paradigm assaying short-term visual adaptation to repetitive stimuli. We first characterized adaptation properties of the visual system, under a classic "paired adaptation paradigm" and our novel more taxing "block adaptation paradigm," using high-density EEG in a group of neurotypical adults. Next we deployed the new visual adaptation assay in a clinical population—those diagnosed with a schizophrenia-spectrum disorder. Here we noted classic early VEP amplitude attenuation in our patient sample and novel visual adaptation deficits were revealed. We further tested the specificity of these findings by using the same paradigm to examine somatosensory adaptation. Differences in basic somatosensory function and adaptation were present in the clinical group although less apparent than in the visual system. Finally, we examined whether altered visual adaptation could serve as a schizophrenia endophenotype. Here we utilized a shortened version of our visual adaptation paradigm (15mins, 32-channel electrode array) to characterized a larger sample of neurotypical adults who were also characterized using the Schizotypal Personality Questionnaire (SPQ, (Raine, 1991)). Multiple regression analysis revealed a significant relationship between high SPQ and less sensitive VEP adaptation. Overall the data provides strong support for atypical visual adaptation in schizophrenia and suggests a potential role for altered visual adaptation as an electrophysiological schizophrenia endophenotype. Future studies employing pharmacological manipulations (e.g. administering nicotinic treatment or dopamine/glu/gaba agonists) and examining first degree relatives of patients may offer greater mechanistic insight into the processes underlying these observed phenomena.