Abstract

The dissertation is focused on the problem of visual perception and its disturbance in patients with schizophrenia. The relationship between dopaminergic transmission at the retinal level and its possible association with the development of schizophrenia (SCHZ) is presented (Adámek et al., 2022). Aberrant signal formation at the level of the sensory periphery most likely contributes to the disruption of the relationship between bottom-up perception and the associated top-down cognition (Silverstein et al., 2020). There is a disruption of visual saliency and an associated reduction in the ability to integrate visual perception into the stream of consciousness (Kapur, 2003). The focus of the first theoretical part of the dissertation is to present the current knowledge of visual perception changes in the SCHZ population at the different levels of the pre-cortical visual perception processing circuit (retina, optic nerve, LGN). Attention will be paid to their influence on higher visual cognition. This section will also introduce the relationship between pathophysiological changes in the visual precortical pathway and changes in cortical areas in SCHZ patients. The second part of the present work is devoted to two experimental researches. The first examines the functioning of visual perception and cognition, their relationship to top--down and bottom-up processing, respectively, and their context in shaping attention and visual scene evaluation. The second experiment presents an innovative methodological approach applying mathematical prediction models of visual saliency to map the relationship between bottom-up and top-down processing in the SCHZ population. Overall, the present work thus seeks to add to the current debate on novel methodological approaches to investigating visual information processing and its relationship to impaired cognition in the SCHZ population.