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FRONTAL BRAIN FUNCTION AND VISUAL EXPLORATION OF NATURAL SCENES IN SCHIZOPHRENIA

S. Beedie[1], D. St.Clair[2], D. Rujescu[3], P. Benson[1]

[1]School of Psychology, [2]Department of Mental Health, University of Aberdeen, Aberdeen, UK, [3]Department of Psychiatry, Ludwig-Maximilians University, Munich, Germany

Scanpaths are the patterns of ocular fixations and saccades produced during visual exploration of a scene. Schizophrenia is associated with a restricted style of visual scanning, characterised by fewer fixations and saccades and shorter scanpath lengths compared with well viewers. Such patterns are reflective of chronic dysfunction in real-world visual processing in schizophrenia. Scanpath measures are also emerging as strong discriminatory tools in schizophrenia trait marker research. However, little is understood about the neurocognitive mechanisms underlying atypical viewing patterns. We conducted an exploratory study of the relationships between patterns of visual exploration and neuropsychological test performance in individuals with schizophrenia to further understand the neural substrates of scanpath abnormalities in this group. Fifty-one individuals meeting DSM-IV criteria for schizophrenia completed a range of neuropsychological tests and viewed a battery of static natural scenes while eye movements were recorded using non-invasive infra-red oculography. Restricted scanpath behaviours were unrelated to measures of sustained attention, visual memory, cognitive interference or general cognitive decline. Restricted scanpath patterns were most strongly associated with short term verbal memory, manipulation of information in working memory and verbal fluency performance. Such functions are unlikely to directly impinge on visual exploration in schizophrenia but may be commensurate with dysfunction of the dorsolateral prefrontal cortex, a region known to play a number of key roles in oculomotor control. The results support a role of frontal brain dysfunction in the formation and execution of viewing behaviours in schizophrenia.

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