

FC02-05

GRASPING BEHAVIOR IN SCHIZOPHRENIA SUGGESTS SELECTIVE IMPAIRMENT IN THE DORSAL VISUAL PATHWAY

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Introduction: This study frames anomalous functional brain organization among persons with Schizophrenia (SCZ) within an evolutionary model of brain development, the Dual Trends Theory (DTT). The DTT argues that neural architecture develops along two separate pathways: the dorsal 'archicortical' trend and the ventral 'paleocortical' trend. The DTT dovetails with visual system organization, which is also comprised of two independent pathways: a visuomotor dedicated dorsal stream and a perceptual dedicated ventral stream.

Objectives: The present study examined the integrity of these pathways using a size-contrast visual illusion. Prior research has shown that, normally, perceptual estimations of object size are susceptible to visual illusions, whereas goal-directed actions are resistant. We hypothesized that, unlike control participants, SCZ patients' goal-directed actions would be susceptible to the illusion, reflecting selective dorsal stream dysfunction.

Methods/results: Here, 42 SCZ patients and 42 healthy control participants grasped and estimated the size of target blocks in both control and illusion conditions. Movement kinematics were measured using a magnetic motion tracking system (Flock of Birds). During estimation, both groups were equally perturbed by the illusion; however, grasping movements of patients alone were influenced by the illusion.

Conclusions: These results suggest disrupted dorsal brain circuitry in SCZ but relatively intact ventral brain circuitry.