

A Structural Investigation of the Brain's Motor Regions in Young Adults with Psychotic Experiences

Tanya Murphy¹, Erik O'Hanlon², Aisling O'Neill², Mary Cannon²

¹ Faculty of Social and Behavioural Sciences, Leiden University, Netherlands

² Royal College of Surgeons, Ireland

Abstract

Psychotic experiences (PE) are subclinical hallucinations and/or delusions that are highly prevalent during childhood and early adolescence. Detecting PE during this period has been found to be a useful predictor of future psychosis-related diagnoses. This study included 34 participants (13 females, 21 males) taken from the Adolescent Brain Development Study cohort at three time-points (tp1 mean age = 11.69years; tp2 mean age = 15.80years; tp3 mean age = 18.80years) (control group n=18, PE-group n=16). Motor dysfunction and processing speed impairment findings among this subclinical PE population prompted this investigation into finding a neuroanatomical correlate. We hypothesised reduced white matter (WM) tract volume and altered tract integrity. Advanced neuroimaging techniques were implemented to delineate the precentral gyrus termination points of the corticospinal tract. Linear effects modelling was the analytic method of choice. Significant Group x Time interaction effects were observed in tract volume ($p = .002$, $d = 0.68$) and integrity ($p = 0.02$, $d = -0.28$). Our findings advocate for trajectory-focused experimental approaches to fully capture the developmental nature of these WM abnormalities. Neuroanatomical, cognitive and motor dysfunction are interconnected; therefore data should be investigated in conjunction to better understand the underlying psychopathology of these symptoms and provide future research.

Keywords: motor dysfunction; precentral gyrus; processing speed; psychosis; white matter tract