

S. Avery¹, A. Huang¹, J. Sheffield¹, B. Rogers¹, S. Vandekar¹, A. Anticevic², N. Woodward¹

Development of thalamocortical structural connectivity in typically developing and psychosis spectrum youth

¹Department of Psychiatry and Behavioral Sciences, VUMC

²Department of Psychiatry, Yale University School of Medicine

Background: Structural connections between the thalamus and cortex are disrupted in schizophrenia. Attenuated psychotic symptoms often begin in adolescence, during a critical phase of neural and cognitive development. However, little is known about the development of thalamocortical structural connectivity and its impact on cognition. **Methods:** We examined diffusion data from 1144 participants (aged 8-21) collected as part of the Philadelphia Neurodevelopmental Cohort, which included 316 typically-developing youth, 330 psychosis-spectrum youth, and 498 youth with other psychopathology. Probabilistic tractography was calculated between the thalamus (seed) and six bilateral cortical regions (targets). White matter integrity (FA) measures were tested for effects of age, sex, and group, and associations with cognition were examined. **Results:** Thalamocortical white matter tract integrity broadly increased with age, was higher in males, and was lower in psychosis-spectrum youth. Better cognition, including measures of complex cognition, executive function, and social cognition, was selectively associated with higher FA in thalamic-PFC and thalamic-posterior parietal tracts. **Conclusions:** These findings suggest that white matter integrity continues to mature rapidly throughout middle-to-late development, is reduced in youth with psychosis symptoms, and is associated with cognitive ability.