Article: 0787
Topic: EPW21 - e-Poster Walk Session 21: Neuroimaging

Autism and Psychosis Traits Diametrically Modulate the Right Temporo-parietal Junction

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The right temporo-parietal junction (rTPJ) is a shared region of networks subtending socio-cognitive functions such as mentalizing and domain-general computations such as attention-reorienting. Atypical activations in the rTPJ have been independently observed in autism and schizophrenia spectrum disorders in tasks activating either network. While considered diagnostically independent, traits of both disorders can co-occur. To date, no studies have examined the effect of such co-occurrence on rTPJ activity.
In this ROI study, we investigated the neural activity of the rTPJ as a function of co-occurring autism and psychosis traits in 24 neurotypical adults while performing a competitive game. Whether the TPJ is a unified brain region has been controversial. Therefore, we also examined the effect of co-occurring autism and psychosis traits within subdivisions of the rTPJ.
Co-occurring autism and psychosis traits diametrically modulated both the ventral posterior rTPJ and the ventral anterior rTPJ, which respectively constitute core regions within the mentalizing and attention-reorienting networks. The diametric effect of autism and psychosis traits within the ventral anterior rTPJ was in the opposite direction to that within the posterior rTPJ.
The interactive effect of autism and psychosis traits implies that inter-individual differences in individuals with autism or psychosis spectrum disorders are likely to be better explained in terms of the relative expression of one disorder vis-à-vis the other. The opposite diametric effects in the anterior versus the posterior ventral rTPJ possibly reflect the nature of the complementary interaction between regions responsible for higher level social cognitive processing with regions subtending domain-general computational mechanism.