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Proceedings of the Annual Meeting of the Cognitive Science Society

Title

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Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 48(0)

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Publication Date

2026

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Peer reviewed

Multivariate structural connectivity signatures related to cross-disorder polygenic risk predict negative affectivity

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Abstract

Genetic ‘cross-disorder’ risk may influence emotion and behavior by conditioning the structural properties of the brain. Here, we investigated the association between genetic cross-disorder risk and network properties of the structural connectome, and how these relate to negative affectivity in a combined sample of healthy human adults from two large-scale research initiatives.

Sparse partial least squares (sPLS) regression was used to define latent components capturing the joint covariance between genetic and imaging features. Polygenic risk scores (PRS) for ten common psychological disorders served as genetic features, while structural connectivity derived from diffusion-weighted imaging served as imaging features. Regression analyses examined the relationship between sPLS-derived component scores and negative affectivity.

135 connectivity edges and PRS of depression, anxiety, and PTSD were most consistently selected to model the joint multimodal relationship. The imaging component scores explained 1% of the variance in negative affectivity.