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Paper Title:	Preliminary fusion of Structural Brain data and Developmental Scores in Epileptic Children through Canonical Polyadic Decomposition (CPD)
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Abstract

This study analyzes structural brain connectivity and developmental scores in children with epilepsy using a model based on Canonical Polyadic Decomposition (CPD). By leveraging Diffusion Tensor Imaging (DTI) to generate connectivity matrices, this study integrates these with MRI volumes and phenotypic scores to compare epileptic and healthy children. The model demonstrates accuracy and stability in identifying specific brain regions associated with cognitive and behavioral functions in both groups, revealing significant differences in brain structure between epileptic and healthy children. Connections in the Lingual-Gyrus, Temporal-Occipital-Fusiform-Cortex, Occipital-Fusiform-Gyrus, Right-Pallidum, and the volume of Left-Putamen are highlighted. These results enhance the understanding of brain connectivity patterns in epilepsy and their relationship to developmental outcomes, potentially improving diagnosis, symptom management, and treatment planning for young epileptic children.