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Structural Differences in Lexical Co-occurrence Networks in Typical Development and Down Syndrome

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Abstract

Lexical network analysis provides a useful framework for examining how words are organized during language development. This study compared the structural properties and semantic relations of lexical networks in typically developing children and children with Down syndrome matched for expressive vocabulary size. Participants were Mexican Spanish-speaking children, and networks were constructed from co-occurrence patterns derived from child-directed speech corpora in Mexican Spanish. Measures of connectivity, clustering, modularity, and hub structure were analyzed alongside thematic and taxonomic semantic relations. Results revealed qualitative differences between groups despite similar vocabulary sizes. Children with Down syndrome showed higher local clustering and stronger thematic, context-based relations, whereas typically developing children exhibited a more balanced integration of thematic and taxonomic organization. Both groups displayed hub-like structures, although with different semantic compositions. These findings suggest that lexical development follows distinct organizational pathways influenced by cognitive and experiential factors, with implications for theories of lexical development and educational interventions.