

**SLI, dyslexia, autism, and other neurodevelopmental disorders:
Insights from procedural and declarative memory.**

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Neurodevelopmental disorders such as Specific Language Impairment (SLI), dyslexia, autism, Tourette syndrome, and ADHD are often studied independently from each other. However, these disorders co-occur in various combinations, and may show both behavioral and neural commonalities.

We propose that two long-term memory systems in the brain, declarative and procedural memory, play important explanatory roles in these disorders. Declarative memory, which is what we often think of as “memory” (Where did I put my keys? What’s the capital of Mongolia?), is rooted in hippocampal and other medial temporal lobe structures. Procedural memory, which underlies implicit cognitive and motor skills such as grammar, video game playing, or riding a bicycle, is rooted in frontal, basal ganglia and possibly cerebellar circuits. We hypothesize that *abnormalities in brain structures underlying procedural memory* underlie at least part of the behavioral phenotypes of these disorders (e.g., impairments of grammar, reading, motor skills). In contrast, declarative memory, which seems to remain largely intact (and may even be enhanced in some cases), is posited to play an important *compensatory* role for many impairments. Comorbidities between the disorders may derive largely from shared brain abnormalities.

We present converging evidence supporting this perspective, from a range of behavioral, neuroimaging, electrophysiological and other methods. We discuss both translational (therapeutic, diagnostic) and basic research implications.