

Building the literate brain: How learning to read depends upon, and changes, brain organization for spoken language.

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The development of skilled reading involves a major re-organization of language systems in the brain. We will present ongoing research from our lab on the genetic and neurobiological foundations of learning to read across writing systems, with particular focus on bi-directional dependencies between brain pathways that are critical in linking spoken and written language. Our research suggests that print/speech convergence in language cortex accounts for individual differences in reading outcomes in high and low risk learners. New longitudinal findings from our lab using computational models to better understand critical gene-brain-behavior connections in early language and speech motor development and reading and are discussed in detail (including new findings with magnetic resonance spectroscopy and multimodal brain imaging that reveals how excitatory and inhibitory neurochemistry moderates language and reading development in high risk children). Finally, we discuss recent studies that extend this brain research into second language learning.