Language learning relies on brain circuits that predate humans

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It has often been claimed that humans learn language using specialized brain components that are dedicated to this uniquely human capacity. However, increasing evidence suggests that language learning depends importantly on general-purpose brain circuits that pre-existed humans. In particular, research indicates both that children learn native languages and adults learn additional languages in evolutionarily ancient circuits that are found in other vertebrates, and are used for a wide range of tasks. For example, birds rely on these circuits to remember where they stored their hidden acorns, while rats use them to follow rule-governed grooming sequences. Similarly, humans depend on these neural systems for tasks as diverse as remembering a shopping list and learning to drive. Converging evidence from multiple brain and behavioral studies suggests that humans also rely on these systems for both their lexical (word) and grammatical (rule-governed combination) abilities, in both first and second language. Newer evidence also suggests that aspects of reading and math are learned in these systems. Moreover, abnormalities in or compensation by these systems can help explain atypical language and other functions, for example in specific language impairment and dyslexia. The research has implications not only for understanding the biology and evolution of language and how it is learned, but also for how language learning can be improved, both for people learning a second language and for those with developmental and other disorders.

Ullman Bio:
Dr. Ullman is Professor in the Department of Neuroscience at Georgetown University, with secondary appointments in the Departments of Neurology, Linguistics and Psychology. He is Director of the Brain and Language Laboratory and the Georgetown EEG/ERP Lab. He teaches undergraduate, masters, PhD, and medical students. His research examines the neurocognition of first and second language, math, reading, and memory; how these domains are affected in various disorders (e.g., autism, dyslexia, specific language impairment, Alzheimer's, Parkinson's and Huntington's diseases); and how they may be modulated by factors such as sex, handedness, and aging.