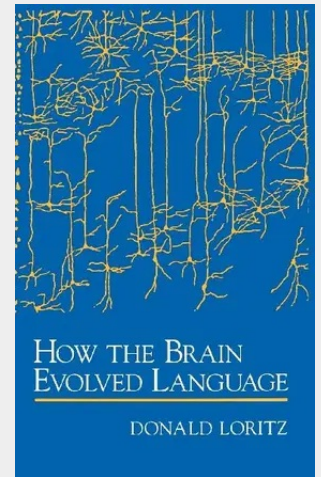


## How the Brain Evolved Language

Recent developments in our understanding of the way the brain works have altered dramatically our view of how it is possible for us to learn and use language - a feat that is still enormously beyond the capacity of any computer in existence or even on the drawing board. Donald Loritz describes the history of the discovery that language is controlled by the brain, and thus somehow located in it, and the subsequent efforts of scientists in many areas - linguistics, psychology, neurology, computer science, and the new field at their intersection, cognitive science - to understand what language is, how the brain "contains" it, and how both language and this complex brain could have evolved. While one can easily find computer-generated cross-sectioned pictures of the brain and its use of language, such pictures do not get down to the level of networks of individual brain cells (neurons), and how such networks are actually capable of learning and storing information like the sounds and meanings of words and the patterns of understandable sentences. Loritz explains the basic properties of the brain and neuron networks, using lay language or terms that he carefully teaches the reader, so that these mysterious processes of neural information storage and access can be understood. He does so using a mathematical model of brain function called Adaptive Resonance Theory, a theory developed by Stephen Grossberg, and applying this theory to what we know about human language - not language as grammarians conceive it, but language as it is really spoken and comprehended. He takes this information about language from recent well-documented research on child language, the signed language of the deaf, and the language of people with brain damage, as well as from normal speakers. Loritz's book is certain to provoke controversy, as it contradicts many of the ideas propounded by another very popular writer on brain and language, Steven Pinker. Unlike Pinker, Loritz argues that language has little if any innate component, and is something that our brains are well-equipped to learn.

How can an infinite number of sentences be generated from one human mind? How did language evolve in apes? In this book Donald Loritz addresses these and other fundamental and vexing questions about language, cognition, and the human brain. He starts by tracing how evolution and natural adaptation selected certain features of the brain to perform communication functions, then shows how those features developed into designs for human language. The result -- what Loritz calls an adaptive grammar -- gives a unified explanation of language in the brain and contradicts directly (and controversially) the theory of innateness proposed by, among others, Chomsky and Pinker.



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