The evolution of language: Sharing our mental lives

Michael C. Corballis

School of Psychology, University of Auckland, Private Bag 92011, Auckland 1142, New Zealand

ABSTRACT

There are two broad views on the evolution of language. One is that language involved a restructuring of thought, unique to humans, which occurred within the past 100,000 years. The other view, sketched in this article, is that human thought evolved gradually and largely independently of language, with properties of generativity and theory of mind. Generative thought includes mental time travel—the capacity to mentally relive past experiences, imagine future ones, and even create purely imaginary scenarios. Behavioral and neurophysiological evidence suggests that this may go far back in evolution. Theory of mind may be more recent, and allows us to imagine being someone else; it is also critical to communicative language itself, which depends heavily on shared trains of thought. Language emerged as a device for sharing our mental stories; it probably began in the Pleistocene as pantomime, but was gradually conventionalized, depending increasingly on culturally defined symbols and rules rather than on physical resemblance. The emergence of speech itself was a late stage in the process of conventionalization, and maximized communicative efficiency. Language allows us to share the knowledge and experiences of others, vastly increasing our mental resources.

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E-mail address: m.corballis@auckland.ac.nz.

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1. Introduction

Language is widely considered to be uniquely human, and the result of some emergent process rather than the product of evolution through natural selection. The Bible teaches that language was a gift from God, and this view was held by many of the major philosophers, such as René Descartes, Thomas Hobbes, and John Locke. Even Alfred Russel Wallace, jointly credited with Darwin as the founder of the theory of evolution through natural selection, could not believe that natural selection could account for the vast differences in mind between human and apes—differences that included the faculty of language. Friedrich Max Müller, Professor of Philology at the University of Oxford, greeted Darwin’s theory with the statement that “There is between the whole animal kingdom on one side, and man, even in his lowest state, on the other, a barrier which no animal has ever crossed, and that barrier is—Language” (Müller, 1873, p. 666).

To Descartes, nonhuman animals were automata, operating according to mechanical principles, but humans were capable of a freedom of thought that defied mechanics. This was most evident, he thought, in language itself; in a 1646 letter to the Marquess of Newcastle, he wrote that:

"... none of our external actions can show anyone who examines them that our body is not just a self-moving machine but contains a soul with thoughts, with the exception of words ..." (Descartes, 1646/1970, p. 206).

The freedom from mechanical constraint lent language its generativity, the capacity to create a potential infinity of possible meanings. The Prussian philosopher and linguist Wilhelm von Humboldt (1836/1999, p. 91) described this as the “infinite use of finite means.”

The idea has persisted into recent times. The psychologist David Premack (1985) writes that “Human language is an embarrassment for evolutionary theory because it is vastly more powerful than one can account for in terms of selective fitness” (p. 282). Noam Chomsky, echoing von Humboldt, regards generativity—or what he has also called “discrete infinity” (e.g., Chomsky, 2007)—as the critical feature that makes human language and thought distinctive, and like Premack suggests that it could not have evolved through natural selection. Instead, he proposed that it emerged within the past 100,000 years, at first in a single individual whom he whimsically names Prometheus. Unlike Premack (2007), Chomsky (2007) downplays the magnitude of change that produced generative language: “Perhaps it was an automatic consequence of absolute brain size ... or perhaps some minor chance mutation” (p. 18). In Chomsky’s view, the essence of generativity is what he terms “unbounded Merge,” the capacity to merge elements recursively, with merged elements themselves merged, create hierarchical structures of potentially unlimited complexity and variety (Chomsky, 2007).

Based on changes in the archeological record, archaeologists have similarly proposed a sudden cognitive change within the past 100,000 years, or even more recently, that transformed the human mind. Richard Klein (2008) writes that it is “at least plausible to tie the basic behavioral shift at 50 ka to a fortuitous mutation that created the fully modern brain” (p. 271). John Hoffecker (2007) writes similarly:

Language is a plausible source for the sudden and dramatic change in the archeological record [after 40 ka] because:

(a) it is difficult to conceive of how the system for generating sentences (i.e., syntax) could have evolved gradually, and
(b) it must have had far-reaching effects on all aspects of behavior by creating the collective brain (p. 379).

Ian Tattersall (2012) seems almost bemused that such a momentous event could have taken place so recently and so rapidly:

Our ancestors made an almost unimaginable transition from a non-symbolic, nonlinguistic way of processing information and communicating information about the world to the symbolic and linguistic condition we enjoy today. It is a qualitative leap in cognitive state unparalleled in history. Indeed ... the only reason we have for believing that such a leap could ever have been made, is that it was made. And it seems to have been made well after the acquisition by our species of its distinctive modern form (p. 199).

These various statements pose a problem for the theory of evolution itself. Darwin himself wrote:

If it could be demonstrated that any complex organ existed, which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down. But I can find no such case (Darwin, 1859, p. 158).

Could language be the case that Darwin feared?

But not all hold to the view that language emerged suddenly. In a classic article, Pinker and Bloom (1990) argue that “there is every reason to believe that language has been shaped by natural selection as it is understood within the orthodox ‘synthetic’ or ‘neo-Darwinian’ theory of evolution (p. 708).” Given the extraordinary success of evolutionary theory to account for the emergence of complex biological phenomena, we should, in my view, be reluctant to make an exception of the human mind, or more specifically of language. The problem is daunting, and has even been called “the hardest problem in science” (Christiansen & Kirby, 2003, p. 1).

In an attempt to meet the evolutionary challenge, in the remainder of this article I sketch out scenarios that are more consistent with an evolutionary account than with the idea that language was the result of a cataclysmic event restricted to our own species.
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