

# The Origin of Human Speech: an "all or nothing" jump!

Consider the following explanation from evolutionary philosopher Stephen Pinker regarding the origin of human speech (from Pinker, S., (1994). 'The Big Bang', Chapter 11 of *The Language Instinct*, pp. 332-369. New York, NY: William Morrow and Company):

"Elephants are the only living animals that possess this extraordinary organ. Their closest living terrestrial relative is the hyrax, a mammal that you would probably not be able to tell from a large guinea pig. Until now you have probably not given the uniqueness of the elephant's trunk a moment's thought. Certainly no biologist has made a fuss about it. But now imagine what might happen if some biologists were elephants. Obsessed with the unique place of the trunk in nature, they might ask how it could have evolved, given that no other organism has a trunk or anything like it. One school might try to think up ways to narrow the gap. They would first point out that the elephant and the hyrax share about 90% of their DNA and thus could not be all that different. They might say that the trunk must not be as complex as everyone thought; perhaps the number of muscles had been miscounted. They might further note that the hyrax really does have a trunk, but somehow it has been overlooked; after all, the hyrax does have nostrils. Though their attempts to train hyraxes to pick up objects with their nostrils have failed, some might trumpet their success at training the hyraxes to push toothpicks around with their tongues, noting that stacking tree trunks or drawing on blackboards differ from it only in degree. The opposite school, maintaining the uniqueness of the trunk, might insist that it appeared all at once in the offspring of a particular trunkless elephant ancestor, the product of a single dramatic mutation. Or they might say that the trunk somehow arose as an automatic by-product of the elephant's having evolved a large head. They might add another paradox for trunk evolution: the trunk is absurdly more intricate and well coordinated than any ancestral elephant would have needed.

These arguments might strike us as peculiar, but every one of them has been made by scientists of a different species about a complex organ that that species alone possesses, language. As we shall see in this chapter, Chomsky and some of his fiercest opponents agree and some of his fiercest opponents agree on one thing: that a uniquely human language instinct seems to be incompatible with the modern Darwinian theory of evolution, in which complex biological systems arise by the gradual accumulation over generations of random genetic mutations that enhance reproductive success. Either there is no language instinct, or it must have evolved by other means. Since I have been trying to convince you that there is a language instinct but would certainly forgive you if you would rather believe Darwin than believe me, I would also like to convince you that you need not make that choice. Though we know few details about how the language instinct evolved, there is no reason to doubt that the principal explanation is the same as for any other complex instinct or organ, Darwin's theory of natural selection.

Language is obviously as different from other animals' communication systems as the elephant's trunk is different from other animals' nostrils. Non-human communication systems are based on one of three designs: a finite repertory of calls (one for warnings of predators, one for claims to territory, and so on), a continuous analog signal that registers the magnitude of some state (the livelier the dance of the bee, the richer the food source that it is telling its hivemates about), or a series of random variations on a theme (a birdsong repeated with a new twist each time: Charlie Parker with feathers). As we have seen, human language has a very different design. The discrete combinatorial system called "grammar" makes human language infinite (there is no limit to the number of complex words or sentences in a language), digital (this infinity is achieved by rearranging discrete elements in particular orders and combinations, not by varying some signal along a continuum like the mercury in a thermometer), and compositional (each of the infinite combinations has a different meaning predictable from the meanings of its parts and the rules and principles arranging them)."