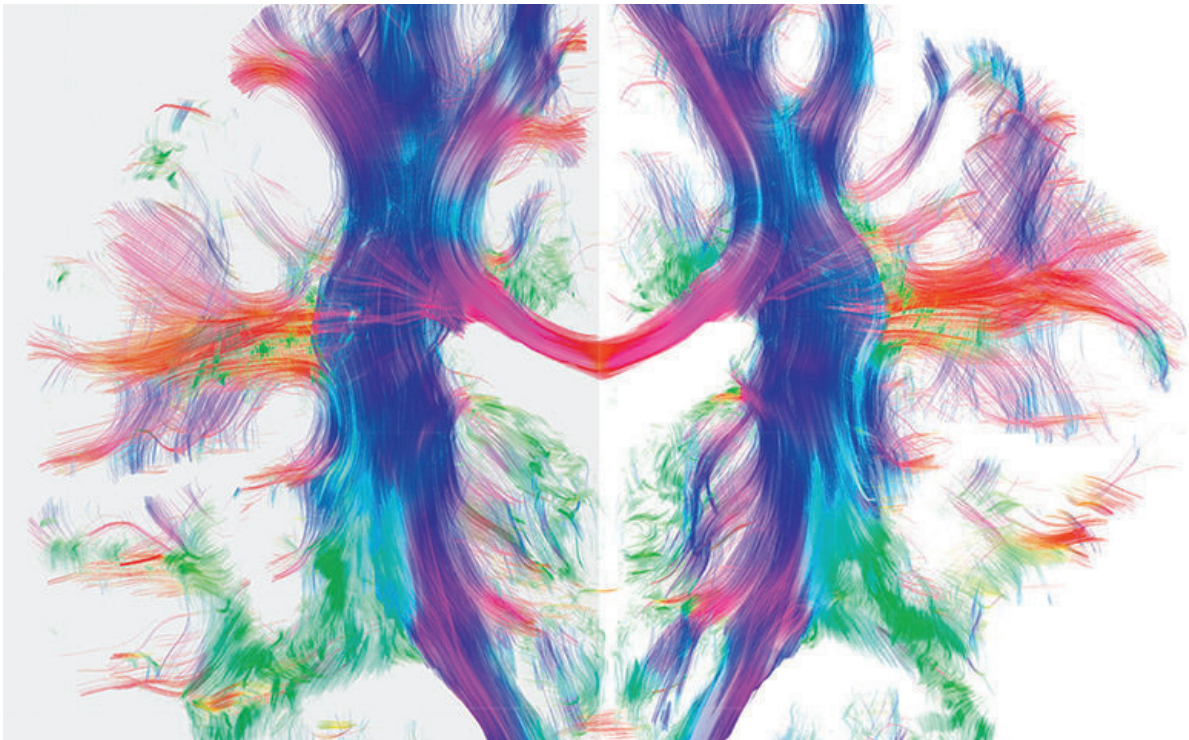


The slight difference: Why language is a uniquely human trait

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In her book Friederici explains how the biological structures in the brain interact—and thereby sounds become words, word groups, sentences and finally content within milliseconds. Credit: MIT Press

Language makes us human. For a long time, psychologists, linguists and neuroscientists have been racking their brains about how we process what we hear and read. One of them is the renowned linguist and

neuroscientist Angela D. Friederici, director of the Max Planck Institute for Human Cognitive and Brain Sciences in Leipzig. Thanks to her we know why humans, in contrast to animals, are able to learn and understand language. It's her achievement to prove linguist Noam Chomsky's famous theory of a universal grammar according to which all humans are born with a universal system for grammar by neuroscientific data. Her book, "Language in Our Brain" has just been published and represents, in essence, a lifetime's work.

"Humans are born to learn language", Angela D. Friederici begins her new book "Language in Our Brain" by discussing the structures in our brains which enable us to develop this fascinating medium which we use to speak and write, think and poetise, email and tweet. "We learn our mother tongue without any formal lessons and are nevertheless able to handle it in every situation without even thinking about it." A capability which remains reserved for us humans. Indeed, apes, dogs, and parrots are able to learn words by associating an abstract symbol or a sound with an object. But they are not able to combine them according to certain rules to make them into meaningful sentences.

But what is it that enables us to master this skill? What is the basis of this purely human achievement? These questions were at the starting point of linguist, psychologist and neuroscientist Angela D. Friederici's research career about 50 years ago. Now she gives us the answers. In her profound work, just released by the renowned publishing house MIT Press of Massachusetts Institute of Technology (MIT) in Cambridge, she explains how the biological structures in the brain interact—and thereby sounds become words, word groups, sentences and finally content within milliseconds.

And Professor Friederici has to know it. Thanks to her research results over the last five decades we have a rough picture of how the brain and mind work together when we process language. One of her crucial

findings is that we usually understand language within three steps: First, neurons check if a sentence's form is correct, its grammar. This happens automatically within about 200 milliseconds. After that, in the following 200 to 400 milliseconds the brain tries to encode the meaning of the words. If the structure of the sentence and the words do not fit to each other, a new analysis cycle follows.

In the spotlight of her research and her book is one fibre tract in the brain, explored by Friederici and her team, that has made massive waves in the world of language research: the so-called fasciculus arcuatus. This connection works similar to a data highway on which language relevant information is transported and it is therefore the crucial structure for processing grammar—the actual basis of language. It is highly developed in the brain of every adult on earth and varies marginally depending on a person's native language. Therefore, it's the neuroscientific evidence for linguist Noam Chomsky's theory, whereby all languages are based on common grammar rules and the ability to recognise them are innate in humans.

"Humans possess this ability from birth. However, certain rules of every language have to be learned", states Friederici. "Therefore, in the sensitive phase of development linguistic communication has to be encouraged to fully develop the fasciculus arcuatus and thereby the full language." So-called banned kids such as Kasper Hauser or "Genie" in the 1970s thus never managed to communicate in a real language.

The long searched for "missing link" could lay in this fibre tract, which explains the leap forward of the simple sound association of animals to the matured language of humans. A reason for this could be because this fibre tract only exists in adult humans but not in other primates and infants, and consequentially language capabilities are more advanced. Even linguist Chomsky is convinced by this idea. In the prologue to "Language in Our Brain" he also supposes that this [brain](#) structure

"appears to have evolved to subserve the human capacity to process syntax, which is at the core of the [human language](#) faculty."

More information: Angela D. Friederici, Language in our brain. (MIT Press, Cambridge, MA, 2017). [pubman.mpg.de/pubman/face ...emId=escidoc:2488166](http://pubman.mpg.de/pubman/face...emId=escidoc:2488166)

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