
Are we the only species to have evolved a language for communication?

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Talking of Language

Why do human societies have language? Is there a "language organ" in human beings? What led to the evolution of human languages?

REMINDING ourselves that we too are animals is exhilarating and at the same time humbling. When we look at human beings in comparison with other animals, we see that every biological feature of human beings has a counterpart in the animal kingdom. This comes out most strikingly when we compare ourselves with our closest cousin, the Chimpanzee.

But does this mean we are not different from other animals in any manner? No, of course we are different. There is one aspect of humans that no other species on Earth has: language.

But are we sure other species do not have a language?

Many attempts have been made to find out whether chimpanzees can understand or use language. Early experiments to see if they could learn or understand spoken language failed as vocalisation of words was tough for chimpanzees. But Washoe, a chimpanzee born in 1965, was trained to use the American Sign Language. At the end of the experiment Washoe had learned 350 signs out of which she could use 150, and understand 200.

Another such experiment presented in a science show on TV tried to find out whether Vervet monkeys have a language. Vervet monkeys appeared to use three separate calls for different kinds of predators. When a Vervet monkey saw a snake, he made a "snake alarm call". On hearing this all the other monkeys stood up on their hind legs, trying to look for the snake. When a monkey saw a leopard, he made a "leopard alarm call", hearing which all the monkeys on the ground ran up into a tree. Similarly, an "eagle call" resulted in all the monkeys looking up to the sky for an eagle. On hearing the "eagle call", the Vervet monkey did not run up into the trees, for the fear that they would then become vulnerable to eagles picking up the young ones off the trees.

There have been reports that whale songs are like languages. But in these reports, the very scientists who worked on the research agree that what was observed in whale songs, is only a hierarchical structure of sounds.

But do these three cases suggest that language is not unique to humans? This does not seem to be the case. Even though the above examples could have been the precursors to a language, they are definitely not languages in the sense that we human beings use it.

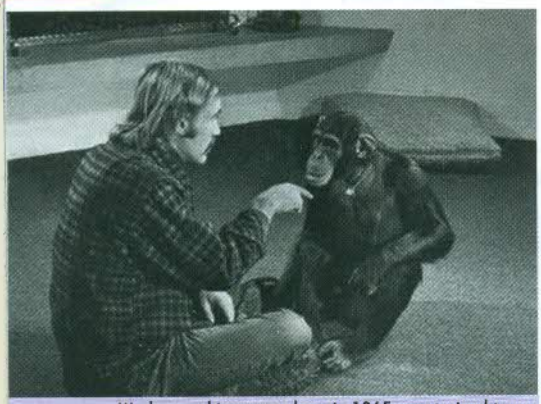
A language is not just a collection of words. Syntax is the life of a language; the beauty and intricacy of the language comes from the different ways in which words can be brought together. Language forms an important part of how individual human beings and societies establish complex meanings about phenomena. Animal communication does not match up to the semantic complexity of human language.

From thinking that language is the result of a general capacity of our brains to learn something new, we today know that language is innate and have progressed to offer theories about its evolution.

Is Language Learned or Innate?

There was a time when language was considered an invention like the wheel. Language is acquired only when taught by parents and society, and thus it was assumed that language was the result of the brain's general capacity for learning.

But language exists wherever human beings exist. There has been no civilisation without a language. In contrast, there have been civilisations without wheels. This could



Washoe, a chimpanzee born in 1965, was trained to use the American Sign Language

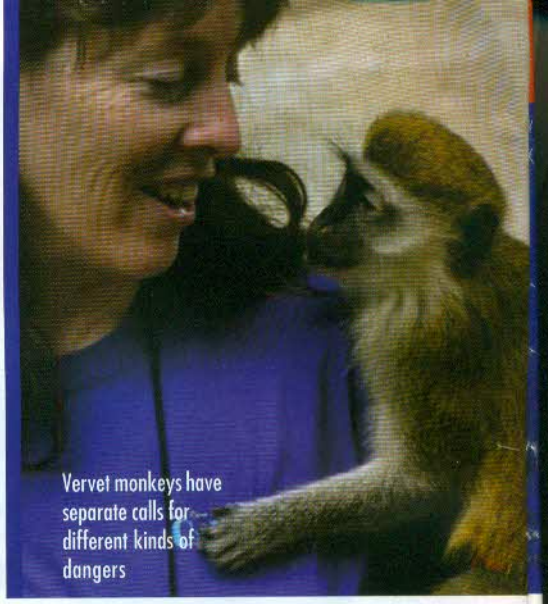
either mean that languages are so indispensable that any civilisation that does not invent a language cannot survive, or that language is something innate in human beings. Innateness has also been sometimes expressed by linguists by ascribing the epithet "language organ".

Today, it is widely recognised that language is definitely innate to an extent. This, of course, does not mean we are born with English, Hindi or Tamil vocabularies, but that the language that the child learns depends entirely on where she is brought up and what she is taught. A child of Tamil parents brought up in a Telugu family from birth will learn Telugu and not Tamil.

When it is said that some part of language is innate, it means that we are born with a capacity to grasp a language's structure, syntax, exceptions, the different types of words involved etc. When we grow, this capacity is activated as we learn vocabulary from our parents or from our society. Though a chimpanzee can do other things that humans do, like using tools and sorting objects, no amount of teaching can make a chimpanzee learn a language.

Looking at how new languages originate in special cases further buttresses the argument that language is innate. There have been some interesting natural experiments on how new languages are formed. These usually happen when peoples of two different languages are brought together and made to live in close contact forcibly for a long time, like when labourers move from one place to another *en masse* in search of work. In such cases, it has been observed that these groups form a new language, which is a mix of both the native languages of the speakers. Since one cannot understand the other's native language, they come to some form of a compromise on a language. Such languages are called pidgins. These are not as complicated as full-fledged languages. They contain only the simple elements needed to get enough communication going for co-operation, planning, transfer of information etc. For example they might avoid the recursive structures that enable us to make sentences like "I went to the movie, whose

Teaching a chimpanzee sign language

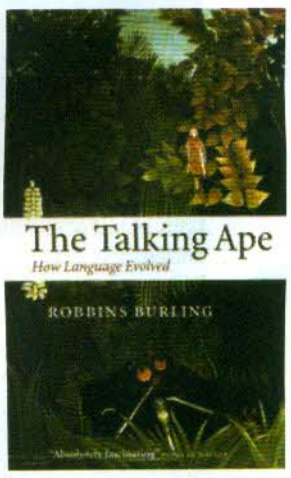


Vervet monkeys have separate calls for different kinds of dangers

leading star is Shah Rukh Khan, who also acted in Fauji, which was a popular serial on Doordarshan, which is the government owned channel of India and was the only one till a couple of decades ago" and so on.

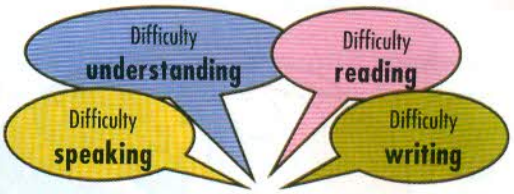
Once people speaking different languages come together, the next generation of children, who grow up in the pidgin environment imbibe the pidgin language as their primary language. As they grow up, they make the pidgin language complex and convert it into a full-fledged language with all the complexities that we expect to see. These languages are called creoles. As we know from experience, it is incredibly hard to learn a language as an adult. That is why adult populations with different native languages who live together form pidgins, and not full-fledged languages. But once children start using pidgins, they take it to its most complicated form.

Even speaking and hearing are not prerequisites for a language. The sign languages used by deaf-mute people also have advanced structures like any other spoken language. It is nothing like the game of dumb charades. The American Sign Language is an intricate language at par with other languages.



There have also been cases where deaf-mutes created their own language when they were secluded

There are reports that whale songs are like languages



APHASIA

Brain injury could cause aphasia

from other language users. This happened in Nicaragua, where the government had established a school for deaf children. These children had never before seen a sign language, and on meeting, they innovated on the signs that each one used individually and came up with a new sign language. According to an American linguist who studied this, it was on par with a regular language.

That language is innate is further supported by disorders that fall under the class of Aphasia, defined as "partial or total loss of the ability to articulate ideas or comprehend spoken or written language, resulting from damage to the brain caused by injury or disease." These problems usually arise from brain injury, stroke or tumour. These disorders affect a person's ability to use language; he may fail to understand spoken language or to speak grammatically.

In fact, a disorder called Anomia affects the ability of the person to remember nouns. People, who suffer from this, are unable to recognise the names of people or things. Though unfortunate, it is intriguing that there is a specific area in the brain for nouns.

Evolution of Language

All these cases suggest that there are innate factors that enable us to learn language, and it should have arisen gradually in a step-by-step manner like everything else in evolution.

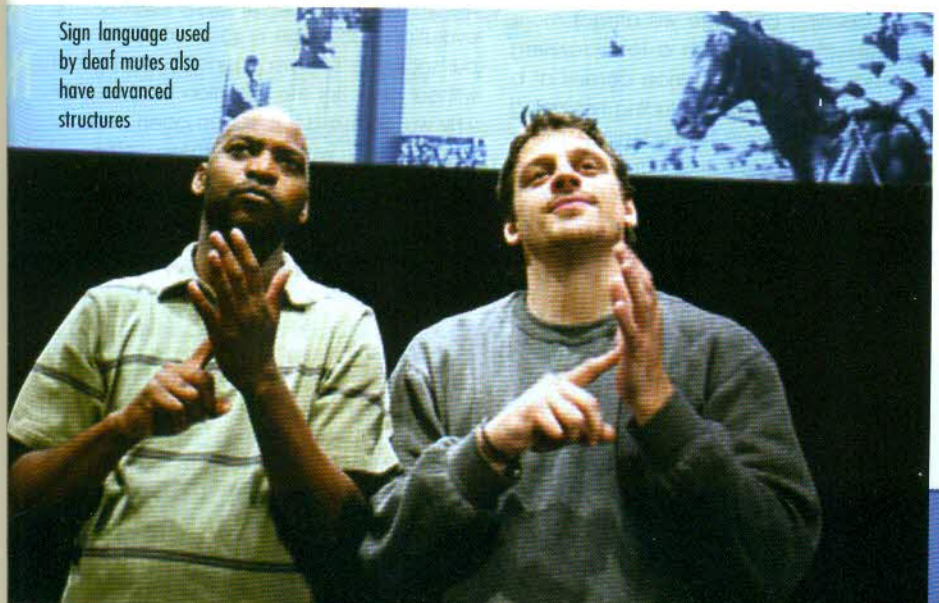
We do not have all the answers, since spoken language does not leave any imprints like fossils, and it is tough to know when it actually started off or how it progressed from just vocalisations to the wonderful complexity that we see today.

Evolution by Natural Selection, the theory proposed by Charles Darwin and Alfred Wallace, is the only known process through which complex traits can evolve. For example, our eyes evolved as an adaptation through natural selection, since those who have marginally better eyes do better than those who have slightly less efficient ones (e.g. find prey or mates much better, or spot a predator a little bit earlier than the rest). Such individuals will survive longer to breed more offspring, who also have a high probability of inheriting those slightly better genes leading to better eyes. This advantage ensures that over long periods of time, the population moves towards better and better eyes. So is the case with opposable thumbs in our hands or our immune system.

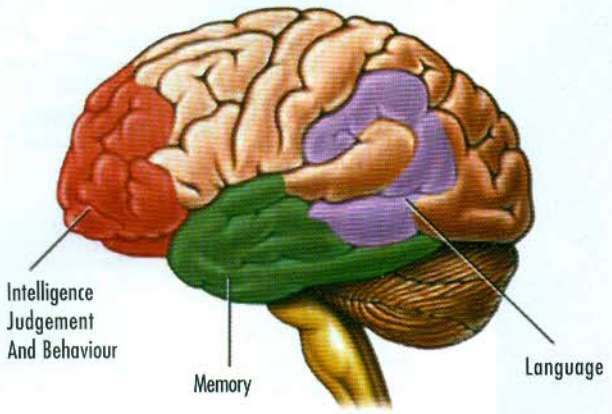
But that does not mean that everything in our body has a purpose, some features might just be side effects or by-products of other processes. For example, the small groove on our upper lip just below the centre of our nose, called philtrum, does not have any specific purpose. The philtrum is the result of the development of our face in an embryo, where the two parts that developed separately are joined at this point. If these two parts do not come together at the same time, it leads to cleft lip problems. Similarly, the red colour of blood itself does not have any specific purpose, but it is a side effect of the haemoglobin molecule being red. If haemoglobin was blue, our blood would have been blue and it would not have impacted us in any way. So, everything that we possess need not have an evolutionary purpose.

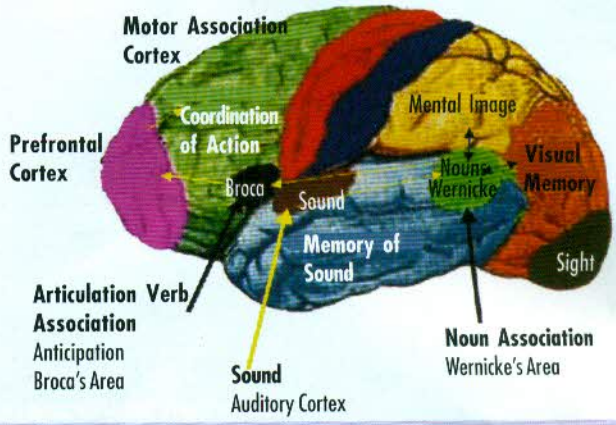
Noam Chomsky (an American linguist considered to be the father of modern linguistics) and Stephen Jay Gould (an American palaeontologist and hugely popular science writer), have suggested that language could be the side effect of a rapidly evolving brain of our ancestors. As our brains started to analyse more and more complex problems they also developed the capacity for language as a by-product. Although coming from heavyweights in their fields, this argument is not entirely convincing – that such a complex thing as language could have come about as a by-product.

In this vein, linguists Steven Pinker and Robbins Burling have argued that language is too specific and complex to have come about as a by-product. Rather, language itself is evolution too, and could be explained by Darwin's theory of natural



Sign language used by deaf mutes also have advanced structures





The brain is supposed to have a language center and also specific area for nouns

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selection, as long as we can ascribe a good purpose to it.

At first glance, the question seems to be a simple one. The purpose of language is communication and coordination, like planning how to catch an animal, how to distribute it and so on. So whoever communicated better had an advantage over others with lesser communication abilities. Moreover, people who have better communication skills will be seen as important people in their groups. Remember how impressed we are by people who can tell a joke in just the right way, or give a moving speech?

However, as Robbins Burling argues in his book *The Talking Ape: How Language Evolved*, the story does not end there. If the purpose was only communication, then animals do it well enough even without language. Packs and herds of animals hunt in a coordinated manner that would need a lot of communication, but they still manage without a language. Apes have complex social lives without a language. No doubt, none of these means of communication are as effective as a language, but if they can do without a language why do we need one? Even if language were necessary, would a pidgin language not have sufficed? Why do we need such an elaborate language?

As evolutionary psychologist Geoffrey Miller, says in his book, *The Mating Mind*, "Human language evolved to be much more elaborate than necessary for basic survival functions."

Sexual Selection Hypothesis for Evolution of Language

Robbins Burling suggests that, even though language started off as a tool for communication and coordination, its complexity owes itself to another process proposed by Charles Darwin called sexual selection. In this he refers to Geoffrey Miller's argument in his book that language and other aspects of human culture like music evolved as a result of sexual selection. Sexual selection is a special case of Natural Selection. In natural selection, nature acts, unconsciously, as the driver of selection, whereas in sexual selection members of the opposite sex of the same species act as selectors.

A classic example given for sexual selection is the beautiful plumage of peacocks, which exists only to impress other females. So a male peacock with a more dazzling plumage will attract more females than one with a less dazzling plumage. This extravagance comes at a cost to the peacocks, including not being able to fly freely and being more conspicuous to predators. But this risk itself could be a means for the peacock to advertise its health as if to say, "I am so healthy, that I can survive in spite of costs of the extravagant plumage". This could mean that females who choose males with bright and bigger plumage, are choosing the healthy ones. This leads to an evolutionary competition between males, wherein successive generations are selected for more extravagant plumage.

Thus, the features that evolve due to sexual selection are more like fashion fads. They don't really serve a purpose, as can be seen by the fact that peahens manage perfectly well without the plumage.

Thus, in addition to the obvious utility of a language, sexual selection too would have played an important role in making language what it is today. Geoffrey Miller also says that the very uniqueness of language in the animal kingdom suggests that Natural Selection could have played an important role. This is because Sexual Selection does not reinforce traits for their use in survival. Hence its pressure could be based on any whimsical trait. Not being utilitarian, the traits that evolve via sexual selection have lesser probability of being replicated by any other species. Thus the trait chosen for has a higher probability of being unique, than traits favoured by natural selection.

From thinking that language is the result of a general capacity of our brains to learn something new, we today know that language is innate and have progressed to offer theories about its evolution. Language is so intertwined with our social life that we cannot think of living without one. But the question of how and why we acquired it is still an open one.

But as with everything else in science, this uncertainty is provisional. Who knows what advances could come up tomorrow to inform us about the origins of our language? We can only wait and watch.

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