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Recent developments in language origin

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In the last ten years, researchers have accepted that language is the outcome of normal evolutionary processes. This has led to a flurry of new work, resulting in some important steps forward in our understanding of language origin. This paper outlines the highlights. The location of proto-humans has been confirmed as Africa, and African hominids are more widely scattered than was previously assumed. Some probably moved out of Africa earlier than was once thought likely. Evolutionary theory has also been explored in more depth. The probable date of language origin has moved earlier, and the precursors of language have been examined, resulting in a more sophisticated understanding of symbolic communication. 'Mirror neurons' have been proposed as relevant to the neurological underpinnings of mind-reading, which may underlie the 'naming insight'. A proto-language stage probably preceded full language, and this proto-language may have involved several layers, which are still visible in language today.

Introduction

Language origin became a respectable academic topic only in the last decade of the 20th century. Before then, the subject had been shunned by serious scholars, most of whom still quoted the 19th century indictment of the topic by William Dwight Whitney, that 'the greater part of what is said and written on it is mere windy talk'.[1] The big change came in 1990 when Steven Pinker and Paul Bloom published a landmark paper entitled 'Natural language and natural selection' in the prestigious journal *Behavioral and Brain Sciences*, alongside a commentary by over 30 peers.[2] This important paper emphasized that language evolved by normal evolutionary mechanisms, and 'demolished some intellectual roadblocks in progress in understanding the relation between evolution and language'.[3] For the remainder of the 20th century, and increasingly in the 21st century, language origin has become a trendy topic.[4–6] On the one hand, work on evolutionary theory

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has fed into our knowledge of the beginnings of language, and on the other hand, work on language has widened our knowledge of evolution. This paper will assess some of this two-way movement, with particular emphasis on findings that have helped us to move forward in our overall understanding of the field. It will outline recent views on: first, the location and date of early hominids; second, aspects of evolutionary theory which are particularly relevant to language; third, possible precursors of language evolution; fourth, the date and place of linguistic evolution; fifth, possible early 'layers' of language.

Location and date of early hominids

Considerable discussion has taken place over the last few years as to whether pre-human hominids and, later, humans should be related to one another as a 'tree', a relatively simple branching structure, leading clearly back to a common ancestor, or as a 'bush', with multiple branches found concurrently, and possibly coexisting (e.g. Pinker[7]). As new skulls are unearthed across Africa, the 'bush' interpretation is becoming widely accepted. The location and date of early hominids are continually being revised. Africa is still thought to be the place of origin of proto-humans, but they may not have been confined to the east side as was argued by Adriaan Kortlandt, a Dutch primatologist who proposed a theory that humans and chimpanzees formed a single ancient species that was split by the formation of the Great Rift Valley, a widely publicized idea that has been labelled the 'East Side Story'[8]. New discoveries indicate that early hominids were scattered more widely than this engaging theory suggested. Recently unearthed fossils indicate that early hominids were probably present across much of the continent[9]. Timewise, the hominid Australopithecus probably included a number of species that lived between 4 million and 1.25 million years ago. Just over 2 million years ago, a new genus Homo, which includes our own species, Homo sapiens, is hypothesized to have emerged from one of the Australopithecan species,[9] although the details are far from clear. The conventional claim is that one group of hominids began to migrate northward around a million years ago, armed with sophisticated stone tools. Yet this simple scenario is now in doubt: researchers at a site called Dmanisi in the Republic of Georgia have unearthed a trove of spectacularly well-preserved human fossils, stone tools and animal remains dated to around 1.75 million years ago.[10] This find is currently being assessed: it is unclear whether this hominid was one of our own genus, or not. But the upshot is that certainly hominids, and perhaps humans, may be earlier and more widespread than we previously realized

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Evolution theory and language

A major sticking point in the past has been how language emerged. The linguist Noam Chomsky, for example, has argued that language might be a case of true emergence, 'the appearance of a qualitatively different phenomenon at a specific stage of complexity of organization',[11] although Chomsky does not make any specific proposals about the mechanism that allowed this to happen, beyond vague references to changes in genes. But Chomsky's problem has stimulated a re-evaluation of old, and often overlooked ideas, in particular those of the American psychologist James Mark Baldwin. According to Baldwin,[12] behavioural flexibility and learning can amplify and bias natural selection, with the result that a subgroup of a species can move into a niche slightly different from that of its ancestors. This explained how new traits could emerge without the necessity of assuming, as did the discredited Frenchman Lamarck, that acquired responses to environmental challenges could be passed on to offspring directly. Taking a Baldwinian approach to language, one might argue that proto-humans who had better memory skills might stand a better chance of survival, for example. These survivors could perhaps pass on the ability to retain a large vocabulary to their offspring. But reassessment of Baldwin represents only the tip of the iceberg of recent attitudes to evolutionary theory, which has become considerably more sophisticated in recent years.[13–15]

Precursors of language evolution

Following on from the realization that language is the product of normal evolutionary processes, the precursors of linguistic evolution have received greater attention. Some of the basic mental and physical abilities underlying the faculty of speech and language are now thought to have been shared with our ape ancestors, as will be discussed below. Language involves the use of symbols. Animals are sometimes claimed to be capable only of affective (emotional) signalling, which has been labelled 'groans of pain' or GOP communication.[16] This is said to contrast with human symbolic communication, which for some researchers is the key to language (e.g. Deacon[17]). But our understanding of symbols has become more fine-tuned, and the dividing-line between pre-symbol and symbol has become blurred. It might be 'more appropriate to postulate varying degrees of referentiality, viewed as points on a continuum'.[18] Accordingly, Hauser[19] proposes that we should tease apart different aspects of symbolization. A bird or animal call may have, he notes: (a) semantic status: a call 'means' something, if it provides information about an object or an event in the environment, as with the much publicized calls of vervet monkeys which distinguish between predators: a 'chutter' is produced as the monkeys stand up

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and look around for a snake; a 'rraup' is uttered as the monkeys hide in the undergrowth to avoid an eagle; and a 'chirp' is sounded as the monkeys leap into a tree to escape a lion or leopard.[20] Over a dozen other examples have been found of bird and mammal calls of this type, to which Marler[21] has applied the term 'functional reference'. (b) Representation: a call represents something to signaller and perceiver, if both form a mental image of it. (c) Reliable reference: a call has reliable reference, if it is reliably associated with some occurrence. Marler's term 'functional reference' is only partially useful, because it does not adequately handle the problem of 'naming'. 'Pure naming' is when an animal or person uses a sign or sound sequence as a 'name' or label for something. Chimps can sometimes 'name' objects as when Washoe, the Gardner's chimp 'named' (in sign language) a toothbrush. She hated having her teeth cleaned, so was unlikely to be asking for it.[22] But chimps mostly ask for things they want, especially food. And so do young children. Human children acquire the 'naming insight' usually at some point in their second year, although deaf people come to it late. The famous Helen Keller, who was blind from the age of two, discovered the 'naming insight' at the age of six, when her teacher held her hand under a flow of water.[23] Yet Keller's account may be over-simple. Susan Schaller found a deaf Mexican, Ildefonso, who as an adult did not yet have the 'naming insight'.[24] Ildefonso shows that there may not be a single moment of insight, but a developing awareness. He acquired the ability to name in layers, first numbers, then nouns, then verbs. The naming insight has been attributed to having a theory of mind. Human beings, and also chimps, have an ability to 'mind-read', to put themselves into another person's shoes, as it were, and to envisage their mental state.[25] 'Mind-reading' is an awareness that develops with age: three year olds are typically unable to achieve it, though four year olds can. However, as research proceeds, mind-reading is turning out to be complex and, as with symbolization, may have various 'layers'. Attention has turned to the possible neurological underpinnings of mind-reading. This is still unclear, although 'mirror neurons', which are found in both humans and apes, may be implicated. An Italian neuroscientist, Giaccamo Rizzolatti is credited with the discovery[26]. He noticed that a section of the frontal lobe of a monkey-brain, (the ventral premotor area), fired when the monkey performed certain actions, such as reaching for an object or putting food in its mouth. Unexpectedly, the same neurons fired when the monkey watched another monkey performing the same task. Rizzolatti labelled these 'mirror neurons', and speculated that he may have identified the neurological basis of mind-reading (cf. Malle[27]). With regard to the physical side of language, we have long known about the difference in size in the frontal lobe of chimp and human brains.[28] Increasingly, our bigger and heavier brain is attributed to the quality of the human diet, and the efficiency with which our ancestors obtained food.[29] Meanwhile, the relationship between bipedalism and our L-shaped vocal tract, diet and our reduced muzzle,

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is slowly becoming clearer (e.g. Aiello[30]), although the development of bipedalism is being pushed ever earlier, to maybe even four million years ago[9]. Bipedalism increased the difficulty of childbirth, as did our enlarged brain.[31] The consequent premature birth of humans led to their extended childhood (neoteny), and arguably encouraged the vocal interaction of mothers and infants.[32] Overall, convergence of mental and physical abilities led to a total that was more than the sum of the parts.

Layers of language

The 'bushy' structures of early hominids considerably antedated the origin of language, which happened at a relatively late date in evolutionary terms. However, the date of language origin is being progressively pushed further back. At one time, language origin was assumed to have occurred at around 100,000 BP, and to have emerged in a virtually complete modern form. Yet this simple, sudden picture is being queried. Recently, a number of writers have advocated a layered approach, suggesting stages by which language might have increased its structural complexity.[33–37] As Jackendoff argues, 'our best hypothesis is that language has evolved incrementally in response to natural selection'.[36] The general view nowadays is that a proto-language preceded full language. Jackendoff elaborates further. He claims that 'one actually can reconstruct from modern human language a sequence of distinct innovations over primate calls'.[36] Furthermore, he argues that some of the 'fossils' of these earlier stages are still present in the grammar of modern language. Some one-word fossils are high effect items such as ouch! wow!, others are situation specific such as hello, goodbye. Jackendoff notes that a phoneme-based vocabulary, with a limited number of phonemes, was – in the long run – needed in order to make words discriminable and memorable. But an intermediate stage might have been that of syllables, he speculates, which allow for a repertoire of motor scripts that aid in rapid articulation. Once a large repertoire of words have been assembled, Jackendoff suggests that 'Agent First, Focus Last, and Grouping are "fossil-principles" from protolanguage, which modern languages often observe and frequently elaborate'.[36] Similarly, Aitchison[4] points out that 'actor first' and 'verb–object bonding' appear to be strong human preferences. Aitchison[38] also argues that by looking at situations today in which humans are pushed back into 'routines', one may find clues to an earlier state of affairs, an intermediate stage between random juxtapositions and real rules. Routines have been identified (for example) by Jean Gleason in the 'trick or treat' routine followed by children when they walk round neighbourhood houses at Hallowe'en, and also when they learn to behave politely.[39] Sports commentaries are another good source of routines, because the commentators are often asked to comment faster than they can easily think, so they tend to have ready made

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phrases, into which they slot occasional different words[40]: 'And it's all over. Honeybunch has won, the winner is Honeybunch'. In short, by looking at language today, we are able to identify layers within it, and make hypotheses about its earlier form. Overall, we are following what Roger Lass has called the 'general uniformity principle',[41] that language in the past followed similar principles to language today, something that was elegantly expressed by William Dwight Whitney in 1867: 'The nature and uses of speech… cannot but have been essentially the same during all periods of its history… there is no way in which the unknown past can be investigated, except by the careful study of its living present and recorded past, and the extension and application to remote conditions of laws and principles deduced by that study'.[1]

Conclusion

This paper has attempted to bring work on language evolution 'up-to-date' to some extent, by outlining some topics that have been explored in recent research. Inevitably, numerous gaps still exist which will hopefully be filled by future workers in the field.

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