On the Relation between Language and (Mimetic) Culture

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What came first: language or culture? On the one hand, language seems to be woven into the very fabric of every human culture; and to such an extent that it is hard to imagine what human culture would be like without language. Indeed, most myths about the origin of humanity – whether religious or otherwise – seem to suggest that humans had language from the very beginning. On the other hand, what use would humans have for language if they didn't have something to talk about? Living in groups governed by highly intricate social interactions would seem to provide an endless amount of possible discussion material. Yet, many other primate species also live in complex social groups – but notably without the benefit of human-like language. Some sort of shared culture would seem to be a plausible additional component as a necessary pre-requisite for language.

Donald (this volume) argues for the latter scenario, proposing a "culture-first" theory in which the prior emergence of a mimetic adaptation provides scaffolding for the subsequent evolution of language. A set of domain-general cognitive skills is suggested to have evolved in early hominids, allowing rudimental knowledge sharing across individuals in a nonverbal manner. The selective advantage of such information exchange would then provide a pressure toward improving communication, leading to the emergence of language as an efficient system for sharing cultural knowledge. Although

this perspective provides suggestions regarding a possible origin of language, it tells us little about the subsequent evolution of language to its current form. In this commentary, I will seek to put Donald's account in relief[1] by discussing possible cognitive constraints that may help explain why language has evolved into the form it has today.

Mimesis and Language Evolution

The cornerstone of Donald's theory of language evolution is *mimesis,* an evolved cognitive capacity unique to humans. The concept of mimesis is perhaps best understood when compared with the related notions of mimicry and imitation. Mimicry refers to a deliberate reduplication of a perceived action without attention to the possible purpose of the event, such as when a child parrots the speech of one of its parents. Imitation denotes a more abstract action reduplication in which more attention is given to its purpose, such as when children imitate adult behavior and responses when playing "house". Finally, mimesis involves the reduplication of action sequences for the purpose of social communication, such as when a child stamps her feet to communicate her disagreement with some decision made by the parents. On this account, mimicry, imitation and mimesis, rather than being categorical distinctions, instead correspond to points on a continuum of increasingly more abstract and socially informed reduplicative actions.

Whereas mimicry and, to a limited extend, imitation can be found in non-human species, Donald argues that the capacity for mimesis has evolved only in the Homo lineage, starting some two millions years ago. The emergence of mimesis is seen to have involved a series of adaptations primarily to the motor systems. This would have provided an expressive repertoire of motor actions upon which a nonverbal

communicative culture could slowly emerge. This mimetic culture then formed the basis for the origin of language, first entering the evolutionary stage as a protolanguage encompassing one- and two-word utterances and then gradually evolving into its current complexity through processes of cultural transmission.

Mimesis and Sequential Learning

An underlying assumption of Donald's view on language origin is that the first protolanguage must have relied on pre-existing primate capabilities. Elsewhere, he has thus suggested that "there might have been a dramatic discontinuity of *function* in the evolution of language, but there could not have been any discontinuities of *mechanism*" (Donald, 1998, p.44). This continuity perspective becomes particularly important when it comes to explaining how various evolutionary changes to primate brain circuits may have affected the emergence and evolution of language.

A key component of the mimesis theory is the ability to memorize social series of experienced events, or "episodes". As such, mimesis is crucially dependent on our ability for sequential learning – that is, the ability to encode and represent the order of discrete elements occurring in a temporal sequence. In line with the continuity perspective, hominid evolution does appear to have involved important refinements of sequential learning. A recent review by Conway & Christiansen (2001) of sequential learning in nonhuman primates, indicates that nonhuman primates share with humans good abilities for the learning of fixed sequences (such as a fixed string of sounds making up a word) and simple statistically governed structure (for example, one can segment the strings "*funny robot*" into "*funny*" and "*robot*" because these two syllable sequences occur

statistically more often together than does "*nyro*"). But when it comes to the learning of hierarchical structure, monkeys and apes fall short of young children. Hierarchical learning appears to be crucial for syntactic processing, where words are combined into phrases that can be combined with other words or phrases to form new phrases that, in turn, can be combined with yet other words or phrases, and so on. Not only would a preadaptation for hierarchical learning seem to be a precondition for Donald's nonverbal mimetic culture, but also – and perhaps more importantly – it would seem to be a prerequisite for the evolution of complex syntactic language.

Language Learning and Evolution

Donald suggests that the human brain has evolved to be maximally flexible and plastic so as to better be able to acquire the intricacies of human culture. As for language itself, he has suggested that "much of the replicative information needed to perpetuate language is stored in culture, not in the genes" (Donald, 1998: p. 50). However, if culture were the only constraint on language, this perspective would suggest that we should find few commonalities among languages (and cultures). Yet, the languages of the world – despite their many differences – also share many systematic similarities in their structure and usage, sometimes referred to as linguistic universals. Although the space of logically possible ways in which languages could be structured and used is vast, the world's languages only occupy a small fraction of this space. For example, of the world's languages more than 50% have a subject-object-verb word order whereas only 0.25% at most have a object-subject-verb word order (Dryer, 1989). Donald's perspective does not allow us to explain the existence of such universal linguistic patterns; it cannot tell us

why language is structured the way it is, nor why language is so readily learnt. To answer these questions we need to go beyond the mimesis perspective (or at least augment it). Instead of asking: 'Why is the human brain so well-suited for learning language?' we need to ask: 'Why is language so well-suited to being learned by the human brain?' By turning what is often a standard question in language evolution on its head, it becomes obvious that languages exist only because humans can learn, produce, and process them. Without humans there would be no language (in the narrow sense of *human* language). This suggests that cultural transmission has shaped language to be as learnable as possible by human learning mechanisms (Christiansen 1994; Christiansen, Dale, Ellefson & Conway, 2002).

In order for languages to be passed on from generation to generation they must adapt to the properties of the human learning and processing mechanisms. This is not to say that having a language does not confer selective advantage onto humans. It seems clear that humans with superior language abilities are likely to have a selective advantage over other humans (and other organisms) with lesser communicative powers. However, what is often overlooked is that the pressures working on language to adapt to humans are significantly stronger than the selection pressure on humans to be able to use language. In the case of the former, a language can *only* survive if it is learnable and processable by humans. On the other hand, adaptation towards language use is merely *one out of many* selective pressures working on humans (such as, for example, being able to avoid predators and find food). Whereas humans can survive without language, the opposite is not the case. Thus, language is more likely to have been shaped to fit the human brain than the other way round. Languages that are hard for humans to learn

simply die out or, more likely, do not come into existence at all.

This view of language as an adaptive system has a prominent historical pedigree. Indeed, nineteenth-century linguistics was dominated by an organistic view of language (for a review see e.g. McMahon, 1994). The evolution of language was generally seen in pre-Darwinian terms as the progressive growth towards attainment of perfection, followed by decay. More recently, the "biological" perspective on language evolution has been resurrected, within a modern Darwinian framework, by Stevick (1963), and later by Nerlich (1989). Christiansen (1994) proposed that language be viewed as a kind of beneficial parasite – a *nonobligate symbiant* – that confers some selective advantage onto its human hosts without whom it cannot survive. Building on this work, Deacon (1997) further developed the metaphor by construing language as a virus.

The basic asymmetry in the relationship between language and the human brain is underscored by the fact that the rate of linguistic change is far greater than the rate of biological change. Whereas Danish and Hindi needed less than 5,000 years to evolve from a common hypothesized proto-Indo-European ancestor into very different languages (McMahon, 1994), it took our remote ancestors approximately 100,000–200,000 years to evolve from the archaic form of *Homo sapiens* into the anatomically modern form, sometimes termed *Homo sapiens sapiens*. Consequently, it seems more plausible that the languages of the world have been closely tailored through cultural transmission to fit human learning, rather than the other way around. The fact that children are so successful at language learning is therefore best explained as a product of the adaptation of linguistic structures, and not as the adaptation of biological structures toward an innate endowment of linguistic knowledge (such as a Universal Grammar).

Constraints on Language Evolution

Although Donald acknowledges that "cultures, including their languages, must be assimilated by individuals during their cognitive development" [p. 8], it also seems clear that his account would suggest that the universal constraints on the acquisition and processing of language are essentially arbitrary. Given the emphasis on a cultural storage of the replicative aspects of language, linguistic universals appear arbitrary because it is possible to imagine a multitude of culturally useful, and equally adaptive, constraints on linguistic form. On the perspective on language evolution put forward here, linguistic universals are in most cases *not* arbitrary. Rather, they are determined predominately by the properties of the human learning and processing mechanisms that underlie our language capacity. The constraints on these learning mechanisms become embedded in the structure of language because linguistic forms that fit these constraints will be more readily learned, and hence propagated more effectively from speaker to speaker.

This account of language evolution also has important implications for current theories of language acquisition and processing. It suggests that many of the cognitive constraints that have shaped the evolution of language are still at play in our current language ability. If this is correct, it should be possible to uncover the source of some of the universal constraints in human performance on sequential learning tasks. For example, in a series of studies that combine artificial neural network modeling and artificial language learning, we have shown how universal constraints on the way words are put together to form sentences, as well as the formation of complex questions across the world's languages, can be explained in terms of non-linguistic constraints on the

learning of complex sequential structure (for an overview, see Christiansen et al., 2002).

Conclusion

Donald (this volume) proposes that the origin of language is rooted in a mimetic culture that evolved prior to the emergence of language. In this commentary, I have argued that although mimesis may provide one possible explanation of language origin, it tells us little about the subsequent evolution of language, including questions such as why language looks the way it does today. I suggested that we may get insights into these questions asking why languages are so well-suited for human learning, thus turning upside down the standard question of why human brains are so well-adapted for learning language. From this perspective, language has been shaped by cultural transmission over many generations to be as learnable as possible by the learning mechanisms of human children. The specific cognitive constraints imposed on the process of learning through cultural transmission have then over time become "fossilized" in the languages of the world as linguistic universals.

Returning to the question whether language or culture came first, it would seem that the linguistic adaptation account of language evolution is at least compatible with Donald's culture-first scenario. Nonetheless, the approach to language evolution presented here also suggests a possible third alternative, one in which language and culture evolved together in a spiral fashion, feeding on each other and constrained by the learning and processing mechanisms of early hominids. In this view, the issue of culture-first or language-first is of less importance. Instead, we can focus on the interplay between culture and language in hominid evolution, and how this interplay may have been constrained by the various cognitive mechanisms in the evolving hominid brain.

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Endnotes

1. It should be noted that the account of the *evolution* of language presented here is not dependent for its validity on the merits of Donald's account of the *origin* of language. Rather, it is an independent account of language evolution that is compatible with Donald's theory of language origin, but not theoretically intertwined with it.