

Beyond mysticism?

Review of Jackendoff, R. (2002)
Foundations of Language. Brain, Meaning, Grammar, Evolution.

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At the Fourth International Conference on the Evolution of Language in 2002 at Harvard University (Hurford and Fitch, 2002), Marc Hauser and Michael Studdert-Kennedy joined Noam Chomsky in a roundtable discussion of the evolution of language. Given Chomsky's famous disdain for evolutionary arguments, this was an event to be witnessed. Alas, it was not enlightening. Chomsky dismissed every suggestion about evolution and language as a 'fairy story', prompting one scholar in the field to observe that 'any discipline that cannot give any account of its long history is itself a fairy story'. This view about the evolutionary origins of language is as important as Jackendoff's emphasis (p. 18) on its complexity: 'One need not have an account of all of it, but one may not wilfully ignore it and still expect to be allowed in the game.'

In this book, Jackendoff recognises the problem of not dealing with language evolution, in the same way as he did at that conference and in an earlier paper (Jackendoff, 1999). He quotes Chomsky (1975) (as cited by Jackendoff, original not seen) on the issue: 'It would be a mistake to suppose that all properties [of neuronal organisation] can be 'explained' in terms of natural selection'. In doing so, Jackendoff recognises that Chomsky's position can be seen as a 'retreat to mysticism' and acknowledges that this is a bad thing. I suspect Chomsky's

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assertion reflects misunderstanding of the nature of evolution rather than of language (!), since evolution gives a theory of (explains) how new variations survive, not of how they first appear.

Jackendoff's approach to the evolution of language, perhaps inevitably for a linguist, is to claim that the 'main evidence comes from the structure of language as we see it today'. This is necessary because there is no record before writing, physical anthropology doesn't help, and the communications of other animals don't give clues (see my similar assessments in Davidson, 2003). There will be many people who disagree with some of these judgments, but I do not question them here. Instead, I want to emphasise an empty category in Jackendoff's argument: it would be as well to provide an anchor in the real world for arguments about evolution that derive from the study of modern languages. The only solid ground for such an anchor is the evidence from archaeology. In making this claim, I am offering a direct challenge to Pinker's (1994) disdainful exposition of his knowledge of being drunk under a lamppost, and his ignorance about archaeology.¹

I have recently (Davidson, 2003) distilled the problem of language emergence into four stages:

- Stage 1) Hominins and other apes communicating without language;
- Stage 2) The discovery or invention of communication using symbols;
- Stage 3) Working out the implications of communication using symbols;
- Stage 4) The appearance among humans of languages which are both symbolic and syntactic.

Noble and I (1996) explored the complex issues surrounding the establishment of communication using symbols – the second stage – concluding that language, by our definition as communication using symbols, emerged late in the story of hominin and human evolution. Recent careful documentation of some of the features of the archaeological record before the timing we preferred suggests that the story is more complex than we presented in 1996 (D'Errico and Nowell, 2000; Goren-Inbar, 1986; Henshilwood and Sealy, 1997; Henshilwood et al., 2001; Marshack, 1997). Just what the alternative story might be like is rather more difficult to describe. Linguists have complained to us that our story has little to do with the traditional concerns of linguistics, although few would argue that symbols are not the foundation on which language was built. The crucial question now is what happened 'afterwords' – in my stage 3. And the impediment here is finding a way to describe what the options were. This is where there are some intriguing possibilities in Jackendoff's treatment of the indicators of earlier stages of language. He finds these supposed fossils in

modern languages, in pidgins and what he calls the 'Basic Variety' of language, and in ape language.

He begins with 'the most important step in getting human language off the ground is the voluntary use of discrete symbolic vocalizations.' Dismissing all attempts to understand how this initial stage was reached – the subject of my book with Noble (Noble and Davidson, 1996) – Jackendoff emphasises how important it is to understand that the beginning of the process of emergence of language is the use of symbolic utterances outside the specific situations in which those utterances have meaning. Vervets only make the sound appropriate to the presence of a leopard in the presence of a leopard (Cheney and Seyfarth, 1990).

Jackendoff suggests a one-word utterance stage – distinct from the one word stage in language learning of infants – composed of exclamatory words of high emotion, that might have preceded the use of symbols, and which can be found in modern human languages as if it were a fossil of that stage. Burling (1993) pointed out how misleading it could be to emphasise these gesture-calls of primates as major evidence of the nature of communications leading to language. One discussion of the relevance of such primate models suggested that it is the vervets' quiet inter-individual grunts and *wrrs* that provide a better model for the precursors of language (Davidson, 1997) – from *wrrs* to words.

Jackendoff next makes the important point that, for language to emerge, the class of symbols needs to be open. This is particularly so if you are willing to follow some linguists such as Carstairs-McCarthy (1999) and accept as symbols the utterances of vervets faced with leopards. How this openness could be achieved is still a mystery, but it helps if you adopt the stricter line that symbols must be arbitrarily related to their referents. Given that infant vervets make the vocalisations without learning, but learn to use them appropriately (Seyfarth and Cheney, 1986), we should not say that such calls exhibit arbitrariness. Arbitrariness is the essential prerequisite for an open class of symbols. How arbitrariness was achieved is another mystery – one we attempted to deal with in our book (Noble and Davidson, 1996: Chapter 8). One feature of vervet calls that is not often commented on is the call in the presence of unfamiliar humans (Cheney and Seyfarth, 1990: 112). Cheney and Seyfarth report that this call was given to them when they began their research and is routinely given when Maasai herdsmen are present (making the attribution 'unfamiliar' problematic). At a later stage of Cheney and Seyfarth's investigation, the call changed to 'call to an observer'. This shows that the vervet call system is capable of some variation and that vervets appear to make judgements about their relationships with others. But it is probably not true openness, as much as an indication that here is a part of the communication system on which selection could operate

to generate openness. On this model, Sigourney Weaver would be recognised as 'not Dian Fossey'. In an open system, there would be a novel utterance which could be glossed as 'let's call this person "Sigourney"'.

The next element in Jackendoff's scheme is to have utterances made up of a small number of meaningless elements – what we know as phonemes. There is a literature which suggests that such 'digital' elements are the building blocks of all creative systems, such as chemistry, genetics and language (Abler, 1989; Studdert-Kennedy, 1998). It is not necessary for languages to have as many phonemes as English does, but it does seem to be necessary for words to be built up of these discrete modules. It may well be that changes in the form of the human vocal apparatus permitted the segmentation of utterances into these discrete forms, but it seems likely that there were many selective forces involved in the evolution the shape of the throat (Lieberman and McCarthy, 1999; Lieberman et al., 2000). Meaningless discrete elements are the key to alphabetic scripts too, and there seems to be a well-defined history of emergence of alphabets by the cooption of signs for sounds from another language. It may be worth exploring this process as a model for the emergence of a phonemic system of utterances, although it is difficult to see how any such argument could be grounded in the real record from the past.

Jackendoff next tackles the question of combinations of symbols. He illustrates well how even a two-word utterance can have many possible meanings, and this gets more complicated as the numbers of concatenated symbols increase – unless there are rules about how the combinations can happen. Jackendoff points out that the appearance of combinations in non-human communication does not seem to involve the sort of changes of meaning involved in human communication. (Note how his argument needs to distinguish between the meaningless elements in human vocal utterances and the meaningless elements of non-human utterances. Among humans, different combinations of meaningless elements produce different meanings; among non-humans, it is not clear that different combinations occur, even though analysts can identify distinct elements.) In this argument, the abilities of apes to combine signs may be crucial evidence of the extent of organisation of language skills (Greenfield and Savage-Rumbaugh, 1990; 1993).

As he builds up the complexity of language, Jackendoff points to the first of two principles guiding the clarity of meaning in combinations of symbols – word order. Others have suggested that there are, in general, some simple preferences about word order, but this is partly a product of a sort of iconicity of meaning (Armstrong et al., 1995). That is to say that the preferences are to start with the Agent – the person or thing that does something – and to put the Focus last, as would be the case if we were thinking of the Agent initiating

an action with respect to the Focus. The word order follows the action like a cartoon – frame by frame. Jackendoff prefers the version of this rule known as ‘the Basic Variety’ over Bickerton’s (1996) model of pidgins for a protolanguage². Another rule of this sort, which occurs in the simplest second language learning and other key examples, is the rule that modifying words modify a word next to them (we might know of them as adjectives). A similar process might be seen in the creation of compound nouns by combinations of two or more simple nouns.

Jackendoff next describes the rules about making and using phrases – phrase structure. Phrases are made up of combinations of words and there are also rules about how simple phrases can be combined into more complex phrases. In modern human languages these tend to have a hierarchical structure that is absent from pidgins and from ape language, so it may not be a feature early in the emergence of language – my stage 4.

The excitement of this approach is that it postulates elements of language that, while present in modern human languages, might be features that emerged successively in evolution. In principle, then, it might be possible to consider how to identify such features in the archaeological record. Only such evidence could ground Jackendoff’s speculations to make them more than an opinion about the features of modern languages.

One approach to the question of grounding would be to take a leaf out of Greenfield’s (1991) book and suggest that there may be cognitive similarities between the neural processing for language and for manipulation of material objects. Ignoring, for the present argument, the objections Noble and I previously pointed to (Noble and Davidson, 1991), we might find parallels between Jackendoff’s scheme and ‘classic’ stages in tool production as indicated in the table (but see Davidson and Noble, 1993 and Davidson, 2003, on the unlikelihood of this classic sequence). On the face of it, the suggestions in my table (Table 1) would imply that language, defined in terms of phrase structure now, rather than of symbols, was even later than Noble and I have been arguing (e.g. Davidson, 1998).

On the whole, then, I applaud Jackendoff for attempting to guide linguistics out of the blind alley of the Chomskian insistence that language cannot be explained by evolution. I shall certainly be trying to explore the implications of the sort of parallels I have cited here. But there is a catch.

Jackendoff language fossils	Archaeology	Evidence/Date
Exclamatory words of high emotion	Limited instinctive use of (?unmodified) materials	Pre-hominin tool use, cf chimpanzees (Whiten et al., 1999), modern evidence supposed to be equivalent to earliest human ancestors
Open class of symbols	Added variety in tools	Flaked stone tools by 2Myr (Wynn and McGrew, 1989)
Discrete meaningless modules	Combined actions before tool achieved	Acheulean Handaxe (Davidson, 2002) from 1–5Myr to 0.09Myr.
Rules about combinations of modules	Set patterns to combinations of actions	Levallois technique (Boëda, 1988; Foley and Lahr, 1997) 300 000 years ago
Word order Modifying words modify the word next to them Compound nouns	'A tool to make a tool' Tools with specific sequences of use Multiple component	Indirect percussion (Bar-Yosef and Kuhn, 1999; Newcomer, 1975) 740 thousand years ago, bone tools (Henshilwood and Sealy, 1997) 70 thousand years Hafting (Boëda et al., 1999)
Phrase structure	Tool kits	

Table 1: Comparisons between Jackendoff's fossil indicators of early language-like communication and some features of the record from the past that might show cognitive similarity.

Evolutionary arguments are about a process of change. Biological evolution does not seem to work by the addition of new features onto an existing substrate, as Jackendoff's scheme implies. Natural selection acts on genetic variations produced or reproduced, sometimes through errors in replication, from one generation to another within populations. Along the way there are distinctive clusters of variations in a population that is known as a species. The technique of comparative anatomy, from which Darwin derived his great insight that the origins of humans would be found in Africa, illuminated understanding of relatedness, but did not provide full understanding of the process of evolution until it could be combined with understanding about the particulate nature of genes.

Jackendoff's scheme allows the possibility that, for the cultural evolution of language, there is an analogy in what we might call the comparative anatomy of languages – he even makes a direct comparison to the analogy at the end of Chapter 8. He says: 'To some degree, then, the examination of the structure of language can come to resemble the examination of the physical structure of present-day organisms for the traces of "archaic" features' (p. 264). But this still does not go far to promote understanding of the processes by which evolutionary change might have happened. We should not be too critical. Hitherto,

linguistics has been dominated by the doctrine of ‘uniformitarianism’ that ‘all languages are in some important sense equal’ (Newmeyer, 2002). I doubt whether a uniformitarian doctrine allows for an understanding of variations in language-like communication that would be essential to an evolutionary argument. Now that Newmeyer (2002) has disposed of the uniformitarian assumption, and Jackendoff and others have provided further insight into the elements of language that survived the selective process, the way may be open for many more insightful arguments about language evolution. I hope that linguists will talk to archaeologists about the possibilities of grounding their arguments realistically in the evidence from the past.

Notes

- 1 Pinker (1994: 352) states: ‘In the tradition of the drunk looking for his keys under the lamppost because that is where the light is best, many archaeologists have tried to infer our extinct ancestors’ language abilities from their tangible remains such as stone tools and dwellings.’ We think Pinker is in error: provided it is in the vicinity of the pub and the carpark, the lamppost is indeed the best place to start. The keys may or may not be under the lamppost, but they must be somewhere thereabouts. Pinker, drunk, would take a taxi home to look for the keys there, ignoring the whole history of how he got to the pub in the first place. (Quoted from Noble and Davidson, 1997. Reply to Mithen. *Cambridge Archaeological Journal* 7: 279–86.)
- 2 For further discussion of Bickerton’s concept of protolanguage see Painter, this issue (ed.)

Book reviewed

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