BOOK REVIEWS


'...to paraphrase René Descartes, we are because we talk'

Philip Lieberman, speech and hearing scientist, 1991

This detailed monograph on one of the most interesting, though controversial, areas of human biology by one of our most distinguished computer scientists is unusual for a number of reasons. Firstly, it integrates two important aspects of human language studies—the ontogeny of language in infants and its evolutionary phylogeny within the higher apes, including man—rather effectively, an exercise rarely attempted or successfully achieved. Secondly, Narasimhan ably challenges Chomsky thinking in the realm of language acquisition, and anyone who has delved into the literature in this field will realize what a daunting task that can be. Finally, the volume incorporates a detailed account of the author's earlier work on infant language development and clearly outlines research strategies that can be profitably pursued in the future—in developmental linguistics, cognitive psychology and language behaviour modelling.

Narasimhan's principal thesis suggests that language acquisition does not involve the development of abstract knowledge of that language per se, as has been suggested by Chomsky, but manifests itself in the appearance of language behaviour in the individual as a performance skill. Chomsky's view has been that actual language performance data do not at all reflect the potential language competence of the speaker and that the latter '... is neither presented for direct observation nor extractable from data by inductive procedures of any known sort'. Narasimhan completely dismisses this view as being extremely anti-empirical and makes a strong plea for shifting the focus of first-language acquisition studies into the realm of directly observable language behaviour. More specifically, he is of the opinion that it is behavioural pragmatics—the ways in which language is used to generate descriptions or perform explorations and manipulations—that must be studied, not the underlying syntax or grammar as has been repeatedly stressed by more traditional linguists. Insight into grammar will, according to the author, then automatically emerge as an offshoot of our understanding of pragmatics.

Another insight that Narasimhan provides us with is that during very early stages of development, language behaviour may arise in close association with sensory-motor modalities, including visual, motor, and tactile behaviours. Drawing directly from these modalities, the newly-acquired repertoire of language expressions would then begin its efforts to understand and represent, albeit indirectly, both the internal and the external worlds of the speaker. We realize also that, in addition to the emergence of these behavioural structures and mechanisms, it is imperative that the child intimately interacts with the language community in which it grows so that appropriate behavioural contexts are learnt and the culturally-determined semantic structures of the language clearly established. Finally, Narasimhan outlines the importance of three basic processes—imitation, rehearsal and analogizing—in promoting the further development of language behaviour in appropriate contexts. And through these mechanisms he advocates a major paradigm shift from the more conventional and rigid rule-driven modelling approach to a more flexible example-driven approach for generating and understanding behaviour.

What I found most illuminating in this section of the book is the detailed description of an observational field study on first-language acquisition by a child that was earlier carried out by Narasimhan with his associates; the almost entire set of transcripts is provided in an appendix. In addition to exemplifying many of the principles laid out by the author, these data will prove invaluable to those interested in pursuing Narasimhan's well-thought-out ideas further. And given the myriad tongues that we speak in, who could provide us with a better natural laboratory?

Narasimhan discusses the production of a number of newly-acquired language expressions rather convincingly in terms of example-driven processes, in contrast to rule-based mechanisms. Some others, however, may require more elucidation. For example, when a child says wented or drunken, it has been argued that an example-based process of imitation of a previously-produced template (e.g. walked) could account for such aberrant forms. I am not sure, however, that such an explanation is necessarily simpler or more satisfying than an alternative one, supported by Chomskyan thought, which suggests that these verbs simply (but mistakenly) assume the standard form by a rule-based process. Another example is that of the interpretation provided for the appearance of the gesture language of congenitally deaf children, deprived of any linguistic input. The structure of such gestural communication, naturally generated by the children, is remarkably similar across cultures but different from that of their own parents. Surely, such patterns are more likely the manifestation of an innate universal rule-based grammar than the ability of these children to improvise on the rudimentary examples provided by the parents.

My other problem with the first part of the book lies in the extremely technical nature of its discourse, which might, of course, be indispensable for a monograph of this nature. A glossary of some of the more difficult technical terms in future editions of this volume would be most welcome.

No discussion in human evolutionary biology has raised as much heat and dust as the debate on the nature and origins of human language. Heat, because this debate has often led to bitter personality clashes between scientists. And dust, because the vehemence of the arguments has more often than not prevented light being successfully shone upon the subject. And all of this primarily due to a uniquely human obsession about our uniqueness. Us as apart from them.

Narasimhan's treatise is a refreshing change in this regard because it steers clear of the debate, choosing to discuss one particular viewpoint alone in some detail. He particularly speculates on why, amongst all communicating species, it is man alone that has acquired a rather uniquely sophisticated language. He then goes on to rightly suggest that
it is the two features of *instructability* and *reflection* that human beings have evolved which now set them apart from all other species. Another feature that makes human language strikingly different is the extremely close link between our language behaviour and our emotional and motivational states; we can reach each other's emotional core with our speech, chimpanzees and other closely-related species possibly cannot. Narasimhan also elaborately describes the various ape language studies which attempted to explore language behaviour in chimpanzees in different ways and specifically focusses on the Kanzi Project. This study differed from all the others in investigating the language comprehension ability of a pygmy chimpanzee, Kanzi, rather than its language production capability. Narasimhan provides a wonderfully thorough critique of the project and again highlights the fact that one must compare and contrast the pragmatics of language behaviour in chimpanzees and in humans rather than the more rigid underlying syntactic structures if any insight is to be gained into the nature of communication in these species. Another important point that Narasimhan makes concerns the importance of non-verbal communication to a species as the chimpanzee. He wonders about the nature of gestural communication in such species, and very perceptively calls for an exploration of the extent to which the evolution of gestural capabilities may have facilitated acquisition of language behaviour. Where I do not agree with Narasimhan, however, is in his contention that Vanitha, his earlier human subject, was clearly superior to Kanzi with regard to her ready object usage in response to how-and-where-questions, and her miming and onomatopoeic abilities. Clearly, in order to unravel his full potential, Kanzi would have to be tested in situations that closely resemble his natural life in the forest - sophisticated object use and miming capabilities may not necessarily be important features in the life of a bonobo.

Finally, Narasimhan raises an extremely interesting point - the necessity of attempting to define the levels of complexity of language behaviour modalities in different species before it is possible to outline an evolutionary phylogeny for them. This leads to the realization that all extant human languages are remarkably similar in their complexity, while the language behaviour of the great apes is profoundly different from human language in its rudimentary structure. While examining the possible reasons why chimpanzees, our closest relatives, have not evolved complex language behaviour, it is suggested that these apes lack many of the non-verbal cognitive capabilities that may be essential substrates for sophisticated language behaviour to evolve; these include symbolic play, true imitation, iconic gesturing, and onomatopoeic vocalizing.

While it is indeed true that many of these cognitive abilities may indeed be lacking in chimpanzees, there is now a growing body of literature that it may not be possible to completely dismiss other capabilities of the great apes with regard to behavioural processes such as observation learning, analogizing, tool-making and tool-use, role-taking, and pretend play.10 Recent analytical investigations into primate vocal communication have also unravelled the semantic structure of different classes of social vocalizations.9,11 In the light of Narasimhan's comprehensive framework outlining different levels of complexity in language behaviour pragmatics, it may be worthwhile to take a fresh look at language behaviour in the hominid group and reinvestigate the causal connections, if any, between language behaviour and other cognitive abilities that prevail within the group. The time has thus come to ask that familiar question once again - does language help us think? And linguists like Narasimhan are clearly showing us the way.


**Anindya Sinha**

National Institute of Advanced Studies,
Indian Institute of Science Campus,
Bangalore 560 012, India

**Annual Review of Entomology 1998**


The Annual Reviews being the most influential serial publication in Entomology, have consistently catered to the growing dimensions of a wide range of areas from morphology and biosystematics, through behaviour, genetics and evolution to Integrated Pest Management and biotechnology. In upholding this tradition, this volume under review is no exception, including in it thirty articles, sixteen of which relate to biology, ecology, evolution, genetics and behaviour and the rest to diverse aspects of control - pesticide, biocontrol, biotechnology and IPM.

The need for promoting research in insect toxicology, physiology, biochemistry and ecology to achieve selective pest control cannot be overemphasized. Though the current dominance of synthetic organic insecticides is essentially due to economic reasons, their failure, resistance, resurgence of primary pests, upsurging of secondary pests and overall environmental contamination have contributed to the growing popularity of IPM concept. From the IPM perspective, the concept of sustainable...