Language origins: Perspectives on evolution

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Introduction

Language Origins is published within the “Studies in the Evolution of Language” series by Oxford Linguistics. Since 2005 when Language Origins was published, the series has produced over ten additional publications. This rapid production and breadth of material indicates a field of linguistics that has grown (or recovered) considerably. Evolutionary linguistics has its origins in the mid-to-late nineteenth century, but fell out of favor due to a lack of empirical data and epistemological concerns.

The resurgence of interest in trying to explain the origins of human language is due to a confluence of factors. One of these factors is the contribution of other disciplines to the investigation of language origins. Evolutionary linguistics is by its very nature interdisciplinary, incorporating insights from biology, computer science, anthropology, psychology, cognitive science, etc. The vast majority of researchers within the field, including the authors in the present volume, presuppose that language evolved under Darwinian (or neo-Darwinian) processes. These neo-Darwinian processes include means other than natural selection: exaptation, genetic assimilation, and emergence (the self-organization of complex systems). Another factor contributing to the resurgence of evolutionary linguistics is the rapid development of computer models which are able to simulate various scenarios that may have occurred in the development of human language. Insights from a wide range of disciplines and the advances made in computer technology have provided new areas for empirical evidence.

I have included the contents of Language Origins below and in the next section provide a short summary for each chapter. The summary of chapters is followed by my general comments about the volume as a whole.
The contents of *Language Origins* include:

1. Introduction: Language origins and evolutionary processes – Maggie Tallerman

Part I: Evolution of speech and speech sounds: how did spoken language emerge?

2. The mirror system hypothesis – Michael Arbib
4. From holistic to discrete speech sounds – Pierre-Yves Oudeyer
5. Infant-directed speech and evolution of language – Bart de Boer

Part II: Evolution of grammar: how did syntax and morphology emerge?

6. Initial syntax and modern syntax – Maggie Tallerman
7. The potential role of production in the evolution of syntax – Dana McDaniel
8. The evolutionary origin of morphology – Andrew Carstairs-McCarthy
9. The evolution of grammatical structures and ‘functional need’ explanations – Bernard Comrie and Tania Kuteva
10. Deception and mate selection – Bradley Franks and Kate Rigby

Part III: Analogous and homologous traits: what can we learn from other species?

11. An avian perspective on language evolution – Irene Maxine Pepperberg
12. Linguistic prerequisites in the primate lineage – Klaus Zuberbühler

Part IV: Language and diversity: how did languages emerge and diverge?

14. Co-evolution of the language faculty and language(s) with decorrelated encodings – Ted Briscoe
15. Acquisition and evolution of quasi-regular languages – Matthew Roberts, Luca Onnis, and Nick Chater
17. Mutual exclusivity – Andrew D.M. Smith

**Summary of Chapters**

In the following section, I provide a short summary for each chapter, excluding each of the section introductions. In Chapter 1, Tallerman introduces the volume as a whole, detailing the current research taking place (circa 2002) in language evolution and the overall direction of this particular volume. Tallerman highlights the interdisciplinary nature of the research, what constitutes proper evidence in the field, controversy involving Chomsky’s non-adaptationist beliefs, and neo-Darwinian processes.
Part I includes four chapters under the heading “Evolution of speech and speech sounds: how did spoken language emerge?” In Chapter 2, Arbib introduces his “mirror system hypothesis,” that “brain mechanisms supporting language evolved from the mirror system for grasping in the common ancestor of monkey and human” (34). There is an area of the macaque (monkey) brain, F5, that is arguably homologous with Broca’s area in humans containing “mirror neurons.” In Chapter 3, Studdert-Kennedy argues for a bottom-up approach, identifying phonetic units as presented in articulatory phonology (termed “gestures”) as the basis for a discrete infinity. In terms of language evolution, Studdert-Kennedy contends that spoken language emerged as the result of “facial and vocal imitation” among early humans, as well as “repeated reuse of the same six vocal organs” (66).

One of the problems for an evolutionary account of the origins of language is how language (or speech) would have developed among a community which originally had no language (or speech). In Chapter 4, Oudeyer shows that emergence, or the self-organization of complex systems, is a mechanism that may be able to account for the development of speech from non-speech. In Chapter 5, de Boer focuses on infant-directed speech as it applies to language evolution. Primary language acquisition presents difficulty for accounts of language origins because of the complexity and difficulty of acquiring language (related to the “poverty of the stimulus” question). Infant-directed speech is an adaptation that may aid in reducing the initial complexity of primary language acquisition, making language more easily learnable.

Part II is entitled “Evolution of grammar: how did syntax and morphology emerge?” and contains five chapters. In Chapter 6, Tallerman refutes the hypothesis put forth by Carstairs-McCarthy that the structure of the syllable was a template for syntactic structure, namely the clause. An evolutionary account of language origins has to account for both the production and comprehension aspects in human language. In Chapter 7, McDaniel focuses on production and seeks to account for the presence of syntactic movement. McDaniel argues that “the evolutionary role of movement was to facilitate language production” (155).

In Chapter 8, Carstairs-McCarthy asks the insightful question as to why language structure has both morphology and syntax. In his evolutionary account, allomorphy is ironically the precursor to morphology. Essentially, morphology arises when the original contexts of morphophonological alternations are lost for some reason. In Chapter 9, Comrie and Kuteva seek to show that “functional need” is not necessary for explaining the rise of grammatical categories in language. They focus on the cross-linguistic use of relative clause and relativization strategies. An “elaborateness of expression” scale is used as the criteria for this relativization typology. In Chapter 10, Franks and Rigby argue that the development of more complex language use in the development of proto-language may have been due in part to a co-evolutionary process in which men offer possibly deceptive cues regarding intelligence and women have to differentiate between the truly intelligent and those being deceptive. Men offer these possibly deceptive cues through creative language use. Franks and Rigby use Relevance Theory to examine the differences between authentic and deceptive language use.

Part III includes two chapters under the title “Analogous and homologous traits: what can we learn from other species?” In Chapter 11, Pepperberg provides evidence for the “co-occurrence of vocal and physical-object combinatorial behavior not previously described in parrots” (260). Pepperberg
makes further connections with non-human primates and argues that “necessary neural substrates for behavioral precursors to language can evolve in any reasonably complex vertebrate brain…” (240). In Chapter 12, Zuberbühler argues that “many of the cognitive capacities that are prerequisite for language are phylogenetically much older” (263). Zuberbühler seeks to explore those cognitive capacities in depth by examining the language abilities of non-human primates. The Grey parrots’ ‘cognitive capacities’ are arguably analogous to humans’ (Chapter 11), while Zuberbühler identifies potential homologous traits between humans and non-human primates (see also Arbib, Chapter 2).

Part IV is entitled “Learnability and diversity: how did languages emerge and diverge?” and includes five chapters. In Chapter 13, Brighton, Kirby and Smith argue that “the relation between language universals and any cognitive basis for language is opaque” (292). The reductionist principle of looking at individuals apart from their environment and concluding the biological/cognitive aspects of these individuals to be the sole foundation for language universals is termed “the principle of detachment.” The follow-up to this argument is that languages adapt to be learnable (echoing de Boer’s conclusions in Chapter 5), and that the cultural influence on the structure of language is crucial. In Chapter 14, Briscoe defends genetic assimilation as a primary neo-Darwinist mechanism for the evolution of the language faculty.

In Chapter 15, Roberts, Onnis and Chater deal with Baker’s Paradox, or “the difficulty of learning…idiosyncratic absences from partial input and without negative evidence” (334). The explanation they develop to deal with this difficulty is “that a learning bias toward simplicity of representation makes language learnable from experience” (349). In Chapter 16, Solan et al. argue that evolutionary fitness and migration are necessary in explaining “the evolutionary dynamics of language” (367). At the same time, they explore linguistic diversity and the reasons behind why so many languages exist in such relatively narrow regions, while other languages around the world are more sporadically spaced out. Nettle (1999) deals with similar questions. They use the ILM computer model to deal with each of the following potential variables: fitness, social status, and drift. Other dynamics concern migration, ecological risk, social networks, etc. (368). In Chapter 17, Smith deals with the evolutionary implications of the “signal redundancy paradox” and the “mutual exclusivity assumption” proposed by Markman (1989).

**Comments**

*Language Origins* succeeds in its self-proclaimed goal to “not purport to give the answers to how, or why, or when language evolved, but…to shed light from a variety of different academic perspectives on all of these questions” (10). The light the authors shed on the subject of language origins are applicable to many subfields within linguistics, but especially applicable to historical and comparative linguistics. The developments in computer modelling (Chapters 4 and 16) and Iterated Learning Model (ILM) simulations (Kirby 2001; Chapters 5, 13, and 15) are particularly significant as they would have a wide application for testing various hypothesized historical scenarios (see Niyogi and Berwick 1997 and Hare and Elman 1995 for actual studies). For example, a historical linguist using an ILM simulation could examine the probability of particular scenarios, e.g., the loss or the development of certain features. By setting different starting points or constraints within the simulation, one could investigate a complex interaction of features over time. In Chapter 4, Oudeyer uses computer models involving artificial systems,
or “robots/agents endowed with working models of the vocal tract, the cochlea, and some parts of the brain” (79). Using an artificial system much like this one, de Boer (2001) examined the origins of vowel systems. More studies such as these could be done within historical linguistics to add extra support to hypotheses and a layer of falsifiability to conclusions that are made.

My only criticisms of the volume as a whole center around the speculative nature of many of the proposals within the book, a resounding self-deprecating theme throughout (see pp. 38, 42, 153, 165, etc. for examples). In addition, I have questions regarding the sufficiency of modern language to bear the burden of providing evidence for early language prehistory. Carstairs-McCarthy points this out (inadvertently it seems) when he says, “[they] may…be making a covert uniformitarian assumption about language, to the effect that it must always have been much as it is now—an assumption that is inappropriate in respect of early prehistoric stages of linguistic evolution…” (182–183). One of the main sources for evidence in evolutionary linguistics is language as it is currently—synchronic language (see p. 1). Despite the new evidences provided by computer models and interdisciplinary research, how evolutionary linguists propose to deal with this difficulty may determine the long-term future of the field.

References


