

The Evolving Science of Language Evolution

Fitch, W. Tecumseh. 2010. *The Evolution of Language*. Cambridge: Cambridge University Press.

by Bridget Samuels

Concomitant with the ascendance of biolinguistics on the research agenda, the evolution of language has garnered considerable interest in the past decade. *The Evolution of Language* by cognitive biologist W. Tecumseh Fitch rides this current wave of popularity, surveying and synthesizing a broad range of recent developments in the field, yet one of the major currents which runs throughout the work is that interest in this strand of human cognitive evolution was strong throughout the twentieth century (and before), contrary to those who cite the 1861 Paris Linguistics Society ban as enforcing silence only broken a good 130 years later by Bickerton (1990) and Pinker & Bloom (1990). Another welcome theme which Fitch stresses repeatedly (see especially p. 175–176) is that we must look past the false dichotomy between “continuist” and “discontinuist” theories of language evolution, seeking a middle ground which acknowledges parts of the language faculty which we share with our primate ancestors as well as those which we do not.

Fitch approaches what Christiansen & Kirby (2003) have called “the hardest problem in science”, that of determining how humans developed the unique capacity for language, from the perspective that modern linguistics and biology have made it possible to refine earlier proposals but have not generated many truly new ideas. All the modern theories can be roughly categorized in terms of which type of proto-language they posit — lexical, gestural, or musical — each of these views being rooted in older speculation. One of the major strengths of the book is the overview of these historical and contemporary proposals. In section 4 (the last of the volume’s four sections, each including at least three chapters), Fitch does an excellent job of presenting the views on proto-language held by Herder, Darwin, Müller, Monboddo, Jackendoff, Lieberman, Deacon, Arbib, Tallerman, Wray, and others. The strengths and shortcomings of each proposal are weighed in a “dispassionate survey of the available hypotheses” (p. 4), with an emphasis on the plausibility in each scenario of language emerging through mechanisms of natural selection, particularly kin selection. Fitch stresses that kin selection is the only way to circumvent the ‘free-rider problem’: Cooperation, in this case information sharing via communication, is not an evolutionarily stable strategy, so the emergence of cooperation in any species poses explanatory difficulty. In light of this, Fitch suggests in chapter 14 (following Dissanayake 1992



and Falk 2004) that a musical proto-language emerged as a way for mothers to remain in contact with infants who, largely due to bipedalism, could not easily be carried at all times. This music-as-motherese scenario is consistent with the intricate relationship between music and language in the brain, the extent of which is still being explored (see Patel 2008 for an excellent overview of the present state of the art). Such a view stands in sharp contrast to those like Pinker (1997) who consider music to be “auditory cheesecake” with no adaptive value.

Another distinct strength of *The Evolution of Language* is section 2, which traces human ancestry all the way back to single-celled organisms. Fitch’s insistence on drawing such a comprehensive family tree is largely rooted in the emphasis he places on convergent evolution across lineages: Similar solutions to a common problem arising in multiple clades serve to highlight the constraints on evolution within which the problem can be solved. Moreover, the articulatory, perceptual, and conceptual systems which serve human language have lengthy evolutionary histories, and Fitch admirably summarizes this heritage (largely shared with other vertebrates). The overview is broad in scope, including material on genetics, geological history, physiology, neuroanatomy, and various other topics which help to shed light on the origins of the human language faculty and genetic endowment more generally.

Unfortunately, the discussion of the *FOXP2* gene, delayed until section 3, which focuses on the evolution of speech, is somewhat lacking. Nowhere does Fitch discuss the fact that mouse models (which antedate the association of mutated *FOXP2* with disordered language in the KE family; Lai 2001) have shown that *Foxp2* is expressed in numerous organs other than the brain, including the lung, intestine, and cardiovascular system (Shu *et al.* 2001). The associations between single nucleotide polymorphisms in *FOXP2* and autism also deserve mention, though they remain controversial (see Shu *et al.* 2005, Stromswold 2008, and references therein). One cannot fault Fitch for omitting discussion of Vernes *et al.* (2008) and Stromswold’s (2008) accompanying commentary, which likely went to press too late to make their way into *The Evolution of Language*, but it is worth noting here that our understanding of *FOXP2* is now beginning to extend to the network of genes which it regulates; among these are *CNTNAP2*, which has been implicated in a number of neurodevelopmental disorders, and the *WNT* gene family, which has been associated with autism, Alzheimer’s Disease, and schizophrenia. Finally, discussing the findings of Shu *et al.* (2005) on mice subjected to knockout of *Foxp2*, Fitch reports that “although vocal production is reduced in these knockout mice, the vocalizations that are produced appear to be normal”, (p. 360). This glosses over crucial differences between homozygous and heterozygous genotypes. A more accurate reflection of the 2005 findings would report that mice with two disrupted copies of *Foxp2* produced virtually no ultrasonic whistles and a dramatically reduced number of clicks compared to both wildtype and heterozygous knockout mice, while those with one damaged copy produced a normal number of clicks but a significantly reduced number of whistles compared to wildtype mice.

From a linguist’s perspective, I found the weakest part of *The Evolution of Language* to be section 1, and in particular the introduction to linguistics in chapter 3. For example, a sub-heading in this chapter purports to discuss “the chal-

lence and complexity of syntax" (p. 102) but only mentions syntactic structure in passing; instead, Fitch asks us to contemplate the different meanings of *take* in 'taking a cookie from a jar', 'taking someone prisoner', and 'taking something for granted'. The descriptions of phrases, phrase structure, and self-embedding (p. 104) could also be better illustrated for a non-specialist audience. Furthermore, Fitch commits a couple of serious factual errors in describing the history of Chomskyan syntax: Government & Binding Theory was the first incarnation of a Principles-and-Parameters based syntactic theory, not its precursor (p. 105), and it is incorrect to state categorically that linguists who work within the Minimalist Program hold Universal Grammar to be syntax-specific (p. 88); see for example Samuels (2009) and Samuels *et al.* (to appear). The discussion of syntactic autonomy also mischaracterizes the aims of formalism: Calling the formalist approach a "gambit" that holds appeal "despite the obvious fact that any complete model of language will eventually have to grapple with meaning" (p. 106–107) belies the fact that semantics, too, can be formal. Just because the study of meaning falls outside the purview of syntax in formalist theories does not mean that the relevance of semantics has been completely discounted. A glaring omission in the discussion of syntax, considering the amount of controversy in this area over the past decade, is any substantial discussion of recursion. Nowhere does Fitch even acknowledge this debate, which is all the more striking considering that one of his own co-authored papers (Hauser *et al.* 2002) sparked the controversy.

The treatment of phonology is idiosyncratic, citing Browman & Goldstein (1986) to an unusual degree. One particularly striking quote comes on p. 96, where Fitch states that "[t]here is little doubt that, eventually, [phonetics and phonology] will be joined seamlessly by a set of bridging principles, much as physics and chemistry are today". Yet one of the defining characteristics of phonology is that it is highly dependent on language-specific history and, as such, can synchronically be quite phonetically arbitrary (see Blevins 2004 and Samuels 2009, *inter alia*). And while Fitch discusses both categorical perception of segments and the possible origins of articulatory gestures, discussion of phonological/phonetic features is virtually absent (see Samuels 2010 for one way animal models can inform our understanding of features).

In multiple places, the approach to phonology could be informed by recent work on Al-Sayyid Bedouin Sign Language (ABSL; Aronoff *et al.* 2008), which emerged over the past few generations in an isolated community in the Negev desert with a high rate of hereditary deafness. For example, Fitch states that a "productive, combinatorial process is a necessity for the generation of complex signals of speech or sign" (p. 100). Yet Israel & Sandler (2009) have argued that not only does ABSL — which is indisputably a full, natural human language — lack a discernible segment inventory and phonotactic restrictions, it also displays a much higher rate of lexical variation than in other sign languages. Where one would typically expect only a small amount of variation (think *tom[ej]to* versus *tom[a]to*), instead Sandler finds many more than a handful of signs, and quite common ones at that, with many more than a handful of variants. Furthermore, researchers report an absence of minimal pairs in the language (Aronoff *et al.* 2008), which supports the conclusion that, particularly among older speakers of ABSL, no true phonological system is in place. Discussing the possibility that hu-

man language has gestural origins, Fitch (p. 467) finds difficulty in transitioning from an iconic gestural system to a language which exhibits duality of patterning in Hockett's (1960) sense. But this transition from iconicity to conventionality is exactly what we see occurring in ABSL, and indeed in assimilatory and compounding processes across signed languages (Israel & Sandler 2009).

Overall, the shortcomings of *The Evolution of Language* do not detract greatly from its enjoyability or utility. It would serve well as an introduction to the study of language ontogeny for researchers in a variety of biolinguistic disciplines, and I can easily imagine it being useful in a classroom setting. Because of the reservations about section 1 discussed above, one should use caution in relying on the text as an introduction to generative linguistics. Additionally, one should keep in mind that the state of the art in such fields as genetics, neuroscience, and evolutionary biology changes rapidly, as I have also mentioned; already there are places where the volume does not represent the most current literature available. These concerns notwithstanding, *The Evolution of Language* provides one of the broadest and most up-to-date surveys of its subject matter, and should prove both informative and thought-provoking for all those interested in biolinguistics.

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