
Terrence W. Deacon, *The Symbolic Species: The Co-Evolution of Language and the Brain*
W. W. Norton & Co: New York & London, 1997,
527 pp., $29.95 (USA), ISBN 0-393-03838-6 (hbk & pbk)

Terrence Deacon has constructed a tome in which he unleashes his considerable learning in quest of several answers to the question, 'What are we?' He is uniquely qualified to take an approach which details the origin and development of, first, language, then the brain, and, lastly, their 'co-evolution.' Described on the jacket as 'a world-renowned researcher in neuroscience and evolutionary anthropology,' all of his background is called upon at various times to pull together the mass of data and supposition that Deacon brings to the table.

In spite of the vastness of the territory he covers, Deacon's writing is most often accessible with a quiet wit that carries the reader along. This reviewer must confess, however, that he found the middle section on the evolution of the brain to be pretty dense traffic. Perhaps someone with a stronger neuroscientific background could follow Deacon into the intricacies of 'using fly genes to make human brains.'

As the title indicates, Deacon attempts to show beyond much reasonable doubt that language does not 'innately' exist in the brain like some sort of Chomskyian L.A.D. Instead he wishes to reveal that language itself has adapted to the brain over the years (much as we continue to adapt software programs for ease and complexity to computer hardware). Over the millennia, language and brain have co-evolved, he reports, and thus there is no need to postulate a generative grammar or a single mother tongue from which all other languages emerged. He rests his case upon 'Baldwinian evolution,' the theory of American psychologist Mark Baldwin from a century ago which suggests 'that by temporarily adjusting behaviors or psychological responses during its lifespan in response to novel conditions, an animal could produce irreversible changes in the adaptive content of future generations' (pp. 322-323). Such changes over time lead to actual genetic changes.

We are, therefore, the symbolic species, the only one who crosses the 'symbolic threshold' as a matter of course—though Deacon does recognize that certain apes, chimps, and bonobo have been led across this threshold too. Borrowing from C. S. Peirce, Deacon understands that most species signal each other with *iconic* reference, a direct response to their environment. More advanced species learn to use *indexical* reference which indicates a class of potential references. With the development of actual language, we have crossed the symbolic threshold so our symbolic reference is most often to other symbols (each of which is indexically constructed). We take up residence in a 'virtual' world with senses of time, space, and personhood unknown to other animals.

These ideas will sound extreme to some but his patiently detailed exposition is generally quite convincing. He steps out into pure speculation when he suggests that the marriage contract was likely the origin of symbolic reference. (How else could mates mark their territory when one hunts and one gathers?)

He doesn't address consciousness, itself, until page 438, where he follows the Peircean referencing system—iconic, indexical, symbolic—to speak of levels of consciousness, 'yet few would be willing to say that the consciousness of a dog or cat is of the same sort that we ascribe to humans' (p. 439). When trying to determine whether or not simpler information processing animals can be said to be conscious, he throws up his hands and declares, 'What a complicated mess!' (p. 441). Yet he eventually argues that *only* symbolic consciousness allows for a sense of selfhood and intersubjectivity: 'Its virtual nature notwithstanding, it is the symbolic realm of consciousness that we most identify with and from which our sense of agency and self-control originate' (p. 452). This throws into doubt just what sort of consciousness he is attributing to instinct-bounded nervous systems of iconic reference. Without agency or selfhood, can a creature be fairly thought to be conscious when terms like non-conscious experiencing would do?

He seems to understand the degrees of complexity as being fundamentally computational. This being the case, no one should be surprised when he predicts toward the end of his long book that computers will someday be capable of symbolic reference—but first they must attain *sentience* so as to become capable of self-evolution. Not an easy request! If and when this does occur, '[t]he question before us is whether we will begin to treat people like unconscious computers, or come to treat conscious computers like people' (p. 464). A rather jarring note on which to close, I thought, especially for a book that focuses mainly on human mentality and the symbolic reference of language.

Greg Nixon Prescott College, Arizona