

Evolutionary Psychology and Primate Cognition

Richard W Byrne

Probably, researchers from a greater variety of disciplines study the non-human primates than any other group of animals: ecologists, zoologists, medical researchers, geneticists, anthropologists -- and psychologists, like myself. Belonging to the same order of mammals as ourselves, the cognitive processes of primates are more likely than those of any other species of animal to be relevant to understanding the remote origins of the human mind.

One might think that this truth has long been generally accepted: far from it. Even today, some would dispute that primate behavior had *any* relevance to the vexed issue of the human mind (Macphail 1998). And in the days when what we'd now call evolutionary psychology was called "comparative psychology", psychology did not do itself any favors by its choice of data objects. Typically, the comparative psychologist studied only a few species: the laboratory (white) strain of the rat; occasionally, the ring-tailed lemur; more often, the rhesus monkey and the chimpanzee. It was hard to escape the impression of a natural scale, with each living species a sort of "model" of an earlier stage in the evolution of the more advanced forms; indeed, for some practitioners, that really seems to have been their underlying model (for details of this history, see Burghardt 1973; Burghardt and Gittleman 1990). In reality, of course, evolution seldom produces a linear progression. Yet, because comparative psychologists only had access to a restricted range of species available handily in captivity, even those who did not think in linear terms had difficulty convincing anyone that their theories did not retain that long-discredited logic of progressive evolution. Comparative psychology became something of a Cinderella subject in psychology.

Its change in fortune, and the subtle transformation to a properly evolutionary psychology, came with the huge burgeoning of primate field studies in the 1970s and 1980s. Fieldwork was done for many different purposes but the growth in knowledge has at last allowed a genuinely comparative data base to be built up. Field primatology began with a few, isolated studies of "glamorous" or easy-to-watch species: chimpanzees, baboons, the species of macaque that live as commensals in Japan and India, those South American monkeys that happened to be marooned on Barro Colorado Island by the waters of the Panama Canal. It has grown to the present state, in which virtually every branch point on the tree of primate phylogeny has at least one detailed study in the wild, and in some cases every species in a group has been studied. Theoretical methods have also advanced over the same period, from the early days of two-species or two-population comparisons (see examples in Sussman 1979), to the modern use of quantitative comparisons, performed as phylogenetic contrasts (to remove concerns of pseudo-replication resulting from possible phylogenetic inertia), across the whole order (e.g. Barton and Dunbar 1997). It is at last possible to focus clearly on the central questions:

- When did a particular cognitive trait enter the human lineage?
- What was its original adaptive function? (And has it been retained for the same reason, or is it now valuable for some different purpose?)
- What is the cognitive basis for the trait, and how does its organization relate to other mental capacities?

In order to illustrate how these questions may be approached, I will use some recent studies of monkeys and great apes.

Establishing when a trait originated would be relatively straightforward, if its presence and absence could clearly be identified in living species. Unfortunately, sure evidence of the *absence* of a cognitive trait is often difficult to obtain, and we may have to be content with a surrogate measure -- and a residual level of uncertainty. Monkeys and apes have long been known to show social manipulations that appear complex and clever to human observers: third-party support to win resources, ruses that rely on deception, long-term nurturing of friendships and reciprocal collaboration, targeted choice of allies and repair of disrupted