Chimps and Humans

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Article Excerpt
Look at Megan. Not just at her distinctively chimpanzee features--her accentuated brow ridge, her prognathic face, her coarse black hair--but at the totality of her being: her darting eyes, her slow, studied movements, the gestures she makes as her companion, Jadine, passes nearby. Can there be any doubt that behind certain obvious differences in her appearance resides a mind nearly identical to our own? Indeed, is it even possible to spend an afternoon with her and not come to this conclusion? Upon reflection, you will probably acknowledge that her mind is not identical to ours. "But surely it's not qualitatively different, either," you will still insist. "I mean, it's obvious from watching her that we share the same kind of mind."

Faced with the overwhelming similarity in the spontaneous, everyday behavior of humans and chimpanzees, how can someone like me--someone who has dedicated his life to studying these remarkable animals--entertain the possibility that their minds are, in profound respects, radically different from our own? How can I challenge the received wisdom of Darwin--confirmed by my own initial impressions--that the mental life of a chimpanzee is best compared to that of a human child?

Actually, it's easy: I have learned to have more respect for them than that. I have come to see that we distort their true nature by conceiving of their minds as smaller, duller, less talkative versions of our own. Casting aside these insidious assumptions has been difficult, but it has allowed me to see more clearly that the human mind is not the gold standard against which other minds must be judged. For me it has also illuminated the possibility of creating a science that is less contaminated by our deeply anthropocentric intuitions about the nature of other minds.

The best available estimates suggest that humans and chimpanzees originated from a common ancestor about five or six million years ago. (1) This is reflected in estimates of our genetic similarity: we share, on average, about 98.6 percent of our total nucleotide sequence in common. This statistic seems impressive. After all, such biological affinity would appear to be the final nail in the coffin of the notion that there could be any radical mental differences between them and us: if chimpanzees and humans share 98.6 percent of their genetic material, then doesn't it follow that there ought to be an extraordinarily high degree of mental similarity as well? This idea has been paraded so frequently through the introductory paragraphs of both scholarly journal articles and the popular press alike that it has come to constitute a melody of sorts; an anthem that if not sung raises doubts as to one's allegiance to the cause of defending the chimpanzee's dignity.

But what does this 98.6 percent statistic really mean? It should be of immediate interest that it is almost invariably misreported. We do not share 98.6 percent of our genes in common with chimpanzees; we share 98.6 percent of our nucleotide sequence. A single nucleotide difference in a string of four hundred may code for a different allele. Furthermore, as the geneticist Jonathan Marks has pointed out in lucid detail, the 98.6 percent statistic has so little grounding in the average mind that confronts it, as to render it essentially meaningless. (2) We might, after all, share 50 percent of our nucleotide sequences in common with bananas and broccoli. But what on earth does it mean to say that we are 50 percent the same as a vegetable? I don't know about you, but I doubt my mind is 50 percent identical to that of the garden pea. And so what would it mean, exactly, if we discovered that our minds were 75 percent chimpanzee?

No, such coarse genetic comparisons will hardly suffice to help us understand the complex similarities and differences that exist between the mental lives of humans and chimpanzees. However, in a climate where certain highly visible experts have radically anthropomorphized chimpanzees, (3) such statistics are heralded as establishing once and for all that chimpanzees are, at the very least, mentally equivalent to two- or three-year-old human children, and should therefore be granted human rights. (4)

A few obvious biological facts may be worth noting here. To begin, it was the human lineage, not the chimpanzee one, that underwent radical changes after our respective geneologies began to diverge from their common ancestor. Since this split, humans have resculpted their bodies from head to toe--quite literally, in fact; as our lineage became bipedal, the pelvis, the knee, and the foot were all drastically reshaped, with modifications in the hand (including new muscles) soon following. To top it all off, we ultimately tripled the size of our brain, with disproportionate increases probably occurring in the seat of higher cognitive function, the prefrontal cortex. Oh yes, and at some point during all of this (no one knows exactly when), natural language--perhaps the most noticeable of human adaptations--emerged as well.

In contrast, chimpanzees have probably changed relatively little from the common ancestor they shared with us about five million years ago. Indeed, of all of the members of the great ape/ human group who shared a common ancestor about fifteen million years ago, none, indeed, has diverged as much as humans. A simple thought experiment may help to put this point into perspective: line up all of the species in question--gorillas, orangutans, chimpanzees, bonobos, humans--and one of them immediately stands out. Guess which one?

In fact, the more we compare humans and chimpanzees, the more the differences are becoming apparent. Even geneticists are starting to catch up with the reality of these differences. New research has shown that rough similarity in our nucleotide sequences obscures the fact that the same genes may have dramatically different activity levels in the two species. So even where humans and chimpanzees share genes in common, it turns out that there are what can only be described as major differences in gene expression--that is, whether, when, and for how long genes are actually working to produce the proteins for which they code. (5) This is the real stuff of genetic comparison, and it casts

our crude genetic similarity to the garden pea in a wholly different light.

What makes these differences in gene expression significant is that they ultimately manifest themselves as differences in the bodies--including the brains--of humans and chimpanzees. So, exactly how similar are the brains of humans and chimpanzees? After all, if we knew that, couldn't we directly address the question of their mental similarity? Well, it would be a start, anyhow. Unfortunately, comparisons of the brains of humans and apes...