

# Building a smarter ape?

August 23 2011, By Faye Flam

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Silly as the movie gets, "Rise of the Planet of the Apes" explores big questions about human evolution.

In the film, scientists use chimp subjects in a gene therapy experiment that triggers the growth of new [brain cells](#). That makes some of the [chimps](#) act a lot like humans - adopting language, writing and drawing. Which raises the question: If [chimpanzees](#) got brainier, would they start acting like humans? And if we tweaked a few chimp genes, could we endow them with the ability to speak, organize in groups and seize the Golden Gate Bridge?

Some experts say it's not so far-fetched while others say more neurons are not enough to get our nearest animal relatives to discuss philosophy.

Apes can be trained to use sign language, said New York University psychologist Gary Marcus, but they don't have much ability or inclination to put together complex combinations of words, convey ideas or tell stories.

They tend to live in the present and focus on their needs, he said. They say they want more bananas, or they want to be tickled, not, "I wonder what would happen if France defaulted."

Those differences are reversed in the classic 1968 movie, for which the new "Rise" is a prequel. There, the humans were mute while the talking apes practiced religion and science and struggled with the implications of evolution and the use of humans in research.

That movie and its sequels inspired Chet Sherwood to become an anthropologist so he could learn "how evolution has operated to make humans so different from apes."

The most striking difference is [brain size](#), said Sherwood, now of George Washington University. The human brain is 3{ times larger than a chimp's. Sherwood said there are people with a developmental defect that leaves them with a chimp-sized brain, and while they have some deficits, they far outperform chimps at language.

"There seems to be something about human brain development and wiring and function" that gives us distinctive capacities for language and symbolic thought, he said.

Others point to the fact that Neanderthal people had brains slightly larger than ours yet left no evidence that they were capable of art or symbolic thought.

Our ancestors, too, looked "anatomically modern" for the last 200,000 years, but they acted pretty much like other primates until about 100,000 years ago, said Ian Tattersall, an anthropologist at the American Museum of Natural History in New York City. Only then is there evidence of symbolic thought in the form of pierced shell beads and ochre paints.

What's weird, experts say, is that there's no apparent trigger for this profound change. Our ancestors were living in Africa, looking more or less like us, and then started making things for no obvious reason.

And yet, at that juncture, we humans began remaking the world in our own minds, Tattersall said, while other branches on the human family tree did not - showing that just getting a big brain didn't automatically mean language or symbolism or art would follow. "We are not super chimpanzees," he said.

Another open question is why our brains got so big compared with those of other apes. There's a downside to having a big brain, said Sherwood, because it takes more energy to run than any other organ. There must be some advantage to it.

Some have argued that varied climates required early hominids to be craftier, while others say the cleverer among our ancestors would have attracted more mates and outreproduced their rivals.

One possible explanation is that the human inclination to form families and involve dads in child care allowed brain expansion to happen for us and not other apes, said Pennsylvania State University [anthropologist](#) Philip Reno.

If you look at other primates, he said, the brainiest have the longest periods of childhood dependence.

Chimps, with their relatively high intelligence, take five or six years to become independent. Since the mothers get little help, they can handle only one offspring at a time, making them very slow at reproduction.

Humans changed the equation by enlisting the help of fathers. That way, Reno said, children can stay dependent even longer than young chimps, and yet a human female can keep making babies every couple of years or so.

In other words, the no-strings-attached mating strategy of male chimps might be limiting their brainpower.

Another way scientists are chipping away at the problem is through genetics. NYU's Marcus has done research on a gene, called FOXP2, that differs between humans and other mammals and appears to be involved in language capacity. People with a defect in this gene have

difficulty with aspects of language.

Further studies, he said, show that FOXP2 influences the action of dozens of other genes. "It's near the top of a cascade," he said. It's not a genetic change that just popped up and gave us language.

Penn State's Reno, too, is scouring through the genome. He said the recipe for making a chimp is nearly identical to the one for making a human, except that the quantities of the ingredients are different.

He's recently compared the genetic codes of humans, chimps, monkeys and mice. What he's found are dozens of differences in areas that "regulate" development.

He identified one part that influences the way the brain kills off excess cells during development. In humans, that process is ramped down, suggesting our brains are sculpted with a finer chisel.

Tweaking these genes in a chimp might help illuminate our own evolution, but our own cultural evolution has made such an experiment feel unethical.

Back in the 1950s, scientists removed parts of chimps' brains to see how they worked, said Sherwood. Now they argue whether it's ethical to put them through brain scanning experiments, since, unlike people, apes won't sit still without being anesthetized.

"We know these are sophisticated and emotionally sensitive animals," he said.

Some scientist have even taken a position that they wouldn't do any experiment on a chimp they wouldn't consider doing on a human. That follows the message of the original movie and the prequel: Treat them as

you'd like them to treat you in case they ever take over the world.

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