

CHIMPANZEE BEHAVIOR AND CULTURE

By Donald C. Johanson

Fossils can tell us about anatomy and diet, but when it comes to emotion and behavior, we must turn to our closest relative, the chimpanzee, whose DNA differs from ours by only 1.2 percent. In fact we are so closely related to these creatures that we have been variously called the “third chimpanzee,” the “bipedal chimpanzee,” and the “naked chimpanzee.”

Described as tailless, long-armed, large-eared, humanlike beasts by Portuguese sailors in the 1600s, chimps had to wait almost a century before earning a more dignified identity when the English physician Edward Tyson came into possession of a carcass. “Wholly a Brute,” he determined, “tho’ in the formation of the Body, it may be more resembling a Man, than any other Animal; an intermediate Link between Ape and Man.” More than 150 years later, British anatomist Thomas Henry Huxley concluded in his *Evidence as to Man’s Place in Nature* that we and the African apes, especially the chimp, shared an ancestor that may have possessed certain behaviors common to chimps and hominids. In 1925 Robert Yerkes, a pioneer in the study of primatology, wrote, “Chimpanzees manifest intelligent behavior which counts as specifically human.” As early as the 1960s, chimps were seen using saliva-moistened sticks to coax delicious termites out of termite mounds; the first evidence of tool use in any primate besides man. And in 2007 Paco Bertolani, a graduate student at Cambridge university, and Jill Pruett, an anthropologist at Iowa State University, reported having observed chimpanzees making and using wooden spears to hunt small primates called bush babies that are nocturnal and sleep during the day in holes in trees. Most often during the rainy season female chimps systematically search those hollows in trees for the presence of sleeping bush babies and employ twigs they have sharpened with their teeth as spears to stab and kill these small primates. Because the creation and manipulation of tools has long been considered the benchmark of hominid activity, these discoveries have blurred the line between humans and apes.

So how exactly does our closest living relative compare to our distant ancestors? Consider that, while *A. afarensis* flourished for close to a million years—a successful stint in anyone’s book, and one that gave rise to even more effective, larger-brained bipeds—chimps in their 8 million years or so of evolution since their separation from our common ancestor have experienced far less dramatic changes.

Everyone knows the story about how an earnest twenty-three-year-old woman named Jane Goodall approached Louis Leakey after a lecture in 1957 and told him that she, too, believed that chimpanzees held many important clues about primitive hominid behavior. Impressed with her passion, Leakey took her on as an assistant, and eventually encouraged her to undertake fieldwork at Gombe National Park on the eastern shore of Lake Tanganyika to observe chimpanzees in the wild.

Jane’s early field observations revealed the gentle side of chimpanzee society, where emphasis was placed on the kindness showed by chimps to one another. Consistent with the “Make Love, Not War” movement in the 1960s, chimp society was often held up as an example of a utopialike community populated by peace-loving vegetarians. Affable chimps were described as engaging in a wide array of peaceful behavior, such as hugging and kissing. Social bonds were reinforced with periods of grooming. Mothers were tender to their offspring, willingly adopting orphans. When aging or injured members of a tribe were dying, sympathetic cohorts would bring food or just linger nearby in a show of support or comfort. At Gombe National Park, Jane

Goodall watched a chimp die of grief following the death of its mother. It was widely suggested that the idyllic, peaceful world of our closest living relatives was a testament to the level to which human society had sunk. We “civilized” animals were killing people in Vietnam. Why couldn’t we be more like chimps?

That peaceful portrait of chimp society was fractured in the 1970s when researchers observed savage killing, infanticide, and even cannibalism in free-ranging chimps. Male chimps regularly form close alliances and patrol the periphery of their territory, resembling none so much as vicious gang members who hunt down and kill unfamiliar males and infants. When a female with offspring joins a new troop, the resident males systematically kill her young. This prevents the male infants from maturing and introducing novel genes into the group, and because a lactating female does not get pregnant, the elimination of her offspring brings her back into estrus, whereupon the resident males can impregnate her. Could such destructive and repulsive behavior so typical of human and chimp societies have been part of *A. afarensis* society?

Richard Wrangham of Harvard University, a leader in chimp research, examined the frequency of violent behavior resulting in death in humans and chimps and concluded that the rates were comparable, but that the level of nonlethal aggression—such as inflicting bite wounds—was significantly higher among chimps. It may very well have been the case that *A. afarensis* males fervently protected their territories with border patrol.

Scientists have established that female chimps leave their natal group to join other troops of chimps. This pattern is typical of modern human societies as well, and may have likewise characterized that of *A. afarensis*. Such behavior may impart a reproductive benefit because it avoids the downsides of inbreeding, which reduces fertility of offspring. Males, in contrast, remain in their natal group and are therefore more closely related to one another than females are. This, along with their lifelong association, promotes very strong social bonds between male chimps that hang together and form strong alliances. Bonded males are thus encouraged to cooperatively defend their territory, a behavior that is fairly rare among mammals.

In 1999 prominent primatologists observing chimps at six different sites were asked to record behaviors that qualified as cultural traditions. They reported thirty-nine distinct behaviors, including no fewer than nineteen types of tool use. Teaching is one of the most important elements in establishing a culture, and chimps learn early that they can use twigs for capturing termites or ants and wad up leaves to use as sponges for soaking up water. They learn from their elders how to retrieve protein-rich bone marrow from carcasses and break open hard-shelled nuts and fruit by using one rock as a hammer and another as an anvil. These are clearly not instinctive behaviors, but resourceful traditions passed down from generation to generation.

Furthermore, different groups of chimps have distinct cultures. Members of the Taï culture in Côte d’Ivoire, for instance, knuckle-knock on trees to attract females; they employ short sticks to eat ants and extract marrow from bone; and they crack open nuts with a stone-and-anvil technique. Chimps of the Kibale Forest in Uganda, meanwhile, give each other “high-fives” upon greeting, but do not collect bone marrow or crack open available nuts. Yet some behaviors are far more widespread, such as tearing up leaf blades to attract playmates or fertile females and wildly dancing during a heavy downpour (rain dancing).

Although such patterned behavior falls short of human inventiveness and creativity, chimps do exhibit rudimentary culture. I was immeasurably impressed by a [video clip posted on the internet](#) that showed a chimp investigating a termite mound. Usually termites escape from their home through an opening on the outer surface that leads through a small tunnel into the mound. But this particular termitarium lacked any openings. The chimp held a slender twig in its mouth and used a thicker stick as a probe to force into the termite hill so he could access the buried insects.



When the stick met with resistance, the chimp used his foot to force the stick in deeper, the same way a human would manipulate a shovel. He did this several times, each time sniffing the end of the probe for evidence of termite odor. Eventually he located the

bounty, at which point he put down the “digging stick” and used the more flexible twig he had been carrying in his mouth to withdraw his prey. The chimp showed considerable forethought to search for a meal, and he even brought the necessary “tool kit” along to complete the job. Whenever I show this video in class, I can’t help envisioning early hominids employing similar tactics.

Meat eating has played a central role in human origin studies, and our predatory behavior has often been invoked to explain early human cooperation, division of labor, brain expansion, and increased intelligence. Jane Goodall was among the first to document predation and meat eating by Gombe chimps—behaviors that came as a minor revelation to many anthropologists, who were surprised that a vegetarian ape would actively pursue red colobus monkeys, bush pigs, and small antelopes. The initial response was that this was aberrant behavior provoked by Jane’s providing bananas for wild chimps. But as more and more observations of chimps hunting were reported, it was inescapable that systematic hunting of small and medium mammals is typical of chimps. Even more astonishing is the fact that the amount of meat consumed in some chimp communities is not that much lower than is typical in some living hunter-gatherer societies. The pattern of hunting behavior differs among chimp communities. Gombe chimps hunt independently, but Tai chimps, which have been extensively studied by the Swiss primatologist Christophe Boesch of the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, hunt in groups, with some males strategically driving the prey toward other males while others block potential escape routes. Another surprising feature of the process is that male chimps share meat, something that is almost unheard of outside human societies. It’s possible that meat is shared between males who have partaken in a cooperative hunt in order to reinforce male-male bonds, ensuring alliances that might be useful during future hunts. Hunting occurs even when fruit is available so it is not driven by hunger.

Chimps seldom scavenge, and driving off a predator such as a saber-toothed cat would have been highly dangerous for *A. afarensis*. Lacking agility and speed, as well as large, slashing canines, *A. afarensis* would also have been ill equipped to chase and

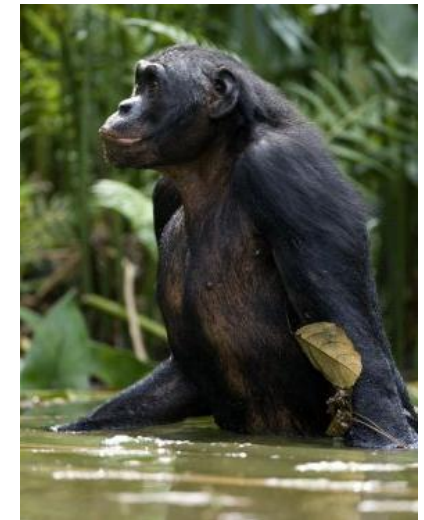
capture prey. Some hunter-gatherers can exhaust an animal by continually pursuing it, but the high caloric cost to *afarensis* and the increased possibility of injury or even death would exceed the rewards.

While chimp hunting is based on pursuit and capture of smaller prey with their powerful hands, human hunting tends to focus on a larger prize, which necessitates the use of some sort of weapon. But this distinction between hunting techniques faded when Bertolani and Pruett filmed Senegalese chimps using mini spears made of sharpened sticks to kill bush babies in their daytime sleeping nests.

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Much of my musing about the behavior of *A. afarensis* is based on the large body of behavioral data that has been gathered for chimpanzees in Africa. Perhaps many of the behaviors characteristic of those apes are ones that were inherited from the common ancestor. To address that possibility, Richard Wrangham decided to tabulate which behaviors are seen in humans, chimps, bonobos, and gorillas. He surmised that if a behavior is common to all four species, it was probably present in the common ancestor and presumably also in early hominids such as *A. afarensis*. His results indicated to him that early hominids probably lived in closed societies dominated by aggressive males that guarded their territory from outsiders, with females emigrating from the community in which they were born. This does not mean, however, that *afarensis* did not deviate from this suite of ancestral behaviors. *Afarensis* must have possessed their own unique set of behaviors because the species was a provocative blend of humanlike features, such as bipedalism, and apelike characteristics, such as a small brain, short legs, and so on, that must have had an unknowable impact on how they procured and processed food, how far they may have wandered each day, and how they interacted with one another socially.

Social behavior simply does not fossilize. If we found fossil remains of the other chimpanzee in Africa, the bonobo, we would have no way of knowing about the unique behavior of this species from the bones alone. More lightly built than the other chimps, the bonobo, confined to the Democratic Republic of the Congo, has been known since the late 1920s. The American anatomist Harold Coolidge designated it a distinct species, *Pan paniscus*, in 1933, and observed that it “may approach more closely to the common ancestor of chimpanzees and man than does any living chimpanzee.”



Excerpt taken from Donald C. Johanson’s *Lucy’s Legacy* (2009)
Chapter 7: “Lucy’s World”