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THE ANTHROPOLOGY OF AFRICAN APES

by *Barbara J. King*



It is a winter morning at the Smithsonian's National Zoological Park. Inside the Great Ape House, an infant gorilla swings from a hanging rope. He plays quietly and alone. Suddenly, the day's peace is shattered by screams. The baby gorilla, wearing a wide grin of fear, runs to his mother's embrace. The group's large and powerful silverback Kuja has taken off after the subadult male Baraka. The younger male's response to this aggression is immediate. Baraka shrieks in fear and bares his teeth in submission even as he tries to defend himself from Kuja.

What started this conflict, I did not see. I was at the zoo to record the gestures used by the five gorillas in Kuja's group—the arm extensions, head nods, and light touches on the body that apes use to communicate with one another. My focal subject of the morning was the baby; my videocamera was trained on his every move. Undergraduates at the College of William and Mary and I wanted to understand how infant apes come to use their bodies, limbs, and hands to communicate with their social partners. Gestures, we were finding, provide a fascinating window on the communication and cognition of our closest living relatives.

The African apes—gorillas, chimpanzees,

and bonobos—are profoundly social creatures, and their communication processes reveal abilities for emotional connection, empathy, the ability to understand another's perspective, and meaning-making. Not every interaction between two apes involves these creative aspects of communication. Sometimes, as when a dominant silverback gorilla beats his chest and charges at a young female, the outcome is predictable: the female almost certainly will submit to or avoid the male. (In bonobo groups, and in at least one chimpanzee population in the wild, the result might be quite different, because females bond together to resist male domination in ways that gorilla females do not.)

Let us return to Kuja and Baraka to see what happens as their conflict unfolds. Most striking is the decision of other family members to put themselves in harm's way in order to support Baraka. Mandara, Baraka's adoptive mother, rushes in to stand with or near him as he tries to deflect Kuja's bites and hits. Clinging to Mandara's belly is Kwame, the young infant who ran to her at the start of the morning's conflict. Mandara clearly supports her adoptive son Baraka over her mating partner (and Kwame's Dad) Kuja.



Ktembe (left) and Kwame. Photo courtesy Jessie Cohen, Smithsonian's National Zoo.



Kwame reaches out to his mother, Mandara. Photo courtesy Ann Batdorf, Smithsonian's National Zoo.

More surprising are the actions of Ktembe, the nearly-four-year-old juvenile male. Ktembe again and again darts into the middle of the melee. In a valiant attempt to lend aid to Baraka, he hits out at Kuja. Comparatively enormous, Kuja swats Ktembe away with a hand—and with ease. Still, Ktembe does not give up.

Meanwhile, for all his evident fear, Baraka refuses to submit completely to Kuja. Baraka remains in a sitting position; repeatedly and tensely, Kuja pulls on Baraka's limbs as if to urge him to go lower, to prostrate himself. If, as I

suspect, this is a suggestion on Kuja's part, Baraka chooses to ignore it. He is not big or strong enough to beat Kuja in a fight, but he is not about to give up either.

All at once, there is a shift in the proceedings. A keen observer can see Kuja's muscles relax, and the tension drain out of his body. He sits down. Immediately, the other gorillas, including Baraka, "read" this change in mood. They disperse into other parts of the enclosure; the fight is over.

What I like about this event stems from its routine nature. Neither spectacular in intensity nor severe in its outcome, this sort of conflict is a natural occurrence for this species when a younger male is maturing in the presence of an older dominating silverback.¹ And it reveals a depth of communication that goes beyond a simple exchange of messages between a sender and receiver, the framework in which scientists used to think of animal communication until relatively recently.

The Emotional Ape

Made visible in the ongoing actions of the apes is their emotional connection. At center stage are not the movements themselves, the screams and hits and assumed body positions, but rather the relationships among the apes. Mandara and Ktembe chose to become involved in a potentially risky encounter, and their choice underscores their bond with Baraka. The meaning of the encounter is cre-



Kuja, the silverback male. Photo courtesy Ann Batdorf, Smithsonian's National Zoo.

ated by the participants as they come together and respond contingently moment by moment. Nothing was preordained about the outcome. Rather, the apes tuned in to subtle and not-so-subtle cues and “read” each other’s muscle tone, gesture, and facial expressions, and attended to vocalizations as well. The communication is at once embodied, emotional, and yet also cognitive. The more Baraka resisted complete submission, the more Kuja tried to get across with gestures what he wanted from the younger male.

Can this anecdote tell us even more? Did Mandara and Ktembe empathize with Baraka’s predicament at the hands of a more powerful male? That is, did these gorillas risk retaliation from Kuja because they were able to take into account Baraka’s perspective as a weaker animal under attack, and “walk a mile in his shoes” to take into account how that might have felt? To these questions I cannot offer a definitive answer, but taking a broader perspective suggests strongly that African apes practice empathy and perspective-taking on a fairly regular basis.

Empathetic Behavior

One of my favorite ape stories involves another event that unfolded in the midst of a routine day, this time at Arnhem Zoo in the Netherlands. It is recounted by primatologist Frans de Waal, the scientist who more than any other has advanced our understanding of ape empathy and perspec-



Krom, a female chimpanzee. Photo courtesy Frans de Waal.

tive-taking. On this day, adult female chimpanzee Krom’s attention was caught by a series of tires that zoo staff had sprayed with water and hung on a horizontal log extending out from the apes’ climbing structure. Krom zeroed in on one tire particularly, the last in the sequence: “Krom pulled and pulled at the one she wanted ... [she] worked in vain on this problem for over ten minutes, ignored by everyone except Jakie, a seven-year-old Krom had taken care of as a juvenile.” As soon as Krom gave up her attempt, Jakie walked over to the same spot: “Without hesitation he pushed the tires one by one off the log....When he reached the last tire, he carefully removed it so that no water was lost, carrying it straight to his aunt, and placing it upright in front of her.” In other words, Jakie, in addition to carrying out some skilled tire-wrangling, empathized with what his aunt wanted—and then made it happen.

Sometimes, the empathy comes through more subtle actions. At the San Diego Zoo, anthropologist Ellen Ingmanson observed what happened when two bonobo brothers contested over a prized food item. Kevin and Kalind had been for some time vying for the group’s highest-ranking position. Kevin was older than Kalind by two years, but on this day, Kalind prevailed and monopolized the food. Giving off the high-pitched happy chirps that bonobo watchers know signal pleasure, Kalind ate; older brother Kevin sat in what Ingmanson described as a dejected posture. At this point, baby brother Kak, age 7, put himself in the picture. Kak laid his hand on Kevin’s shoulder and looked him right in the eyes. Then, he walked over to the victorious Kalind and groomed him. What a savvy seven-year-old! Kak paid tribute, by grooming, to the victor but first stopped to empathize—this is Ingmanson’s interpretation—with the loser. To do this, he must have been able to project into his own mind something of the emotion of defeat felt by his older brother.

Might examples like this come about only because the apes live in captivity? Could their heightened responses stem from their close relationship with humans? Evidence to the contrary comes from the work of long-time chimpanzee observers Christophe Boesch and Hedwige Boesch-Achermann, who work at Tai in the Ivory Coast of West Africa. The Tai community’s dominant male, Brutus, showed empathy akin to young bonobo Kak’s when a female chimpanzee was killed by a leopard. Brutus sat with Tina’s body for hours, and controlled which community members could and could not approach. The only infant



Lana, a young adult female bonobo from San Diego Zoo with her first infant. She is using both hand and facial gestures towards the observer, Ellen Ingmanson, in a greeting and to show her the infant who is clinging to her waist. Photo courtesy Ellen Ingmanson, 1980s.

allowed to come near was Tarzan, Tina's baby brother. He sat and gently tugged on Tina's hand. By his choice to allow this, Brutus seems to have acknowledged the special bond between Tarzan and Tina, and felt empathy for Tarzan's emotional state.

Two chimpanzee mothers at Tai taught their youngsters how to crack nuts with tools. One mother slowly demonstrated the nut-cracking technique to her son and the second intervened as her son positioned the nut for cracking. Although direct teaching like this is rare in chimpanzees, a lower-level type of "scaffolding" behavior is more common. Mothers place hammer tools and nuts to crack in appropriate positions, for example, to facilitate their offsprings' first attempts. Both techniques, though especially outright teaching, imply that the teacher understands something specific about what the pupil knows—or does not know. All educators function in this way; we do not walk into the classroom and teach our college students the ABC's, nor do we convey the fine points of physics to our kindergartners.

These behaviors of the Tai chimpanzee are best understood through the lens of empathy and perspective-taking. Skeptics can always come up with creative alternative explanations for empathy and perspective-taking. In

the case of Kak or Brutus for example, maybe the apes were selfish and only trying to "get in good" with another social partner by acting in a way that seemed kindly. Or maybe their seemingly empathetic behavior was carried out without any conscious intent but was somehow programmed by genetics.

Ape Communication and Cognition

In any single case, it might be possible to explain away ape empathy and perspective-taking. But in aggregate, the evidence is strongly convincing. I often wonder how much more "out there" is left to discover about communication and cognition among wild apes. Anthropologist Richard Wrangham observed an 8-year old chimpanzee in Uganda carrying around a small log. The youngster retrieved the log if it fell from a tree, and even fashioned a nest for the log at night. Wrangham thought the ape might have constructed an imaginary friend for himself to reduce the sting of his mother's inattentiveness during a pregnancy.

Researchers who want to understand ape communication and cognition benefit from recent experimental studies. Emma Cartmill and Richard Byrne, working with orangutans in captivity, show that these great apes of Asia modify their communication strategies depending on

whether their human partner apparently understands, or does not understand, their message. The orangutans were offered highly prized and not-so-highly prized foods in an experimental situation. They had clear opinions about what food they wished most to eat and gestured to zoo staff to make those preferences clear. When the humans responded as if they somewhat understood, by giving half the food desired to the orangutans, the apes repeated the gestures that they had been using all along. However, when the humans conveyed no inkling that they grasped what the orangutans wanted, and offered only undesirable food, the apes switched tactics and began to use different gestures altogether.

Primatologist David Leavens notes that “the orangutans made tactical decisions about their signals as a consequence of different degrees of understanding by their human caregivers.” This finding bears directly on ape perspective-taking, and similar experiments will no doubt soon be carried out using African apes as subjects. Looking at the field of ape communication generally, Leavens is already able to conclude that the great apes “have demonstrated that they display a rapid and sophisticated negotiation of signal meanings.” Active negotiation between partners is a key aspect of both perspective-taking and meaning-making, as we have already seen.

A message jumps out from the research on apes that I have described thus far. No research method is naturally superior to all others. Rigorous experimentation and keen observation, quantitative report and qualitative description—all are worthy methods and must work in concert to fill in the picture about what our closest living relatives think, know, and feel. Even the anecdotal evidence has its place in illuminating rare behaviors among the apes.

Washoe

What broader take-home messages can be extracted from this body of work? First, emotion plays a critical role in both communication and cognition of African apes. Ape communication is not necessarily *either* emotional *or* cognitive; it may be both. In fact, a robust back-and-forth exchange of emotion-based gestures and vocal expressions may well bootstrap cognition. This suggestion gains support from the skills of the famous “language apes.” Washoe, the chimpanzee who made global headlines when she died last October, learned aspects of American Sign Language by virtue of her emotion-based relationship with human

caretakers. Washoe signed to herself; signed with her ape companions in high-arousal situations; and taught some signs to her adoptive son by molding his hands. When Washoe wanted to refer to an item for which she had no ready vocabulary, she sometimes created her own label, as in signing “open food drink” for “refrigerator.” These facts are well-known. What has sometimes been forgotten is the depth of the emotion that underlay her language learning. Washoe’s feeling for others became visible when she expressed empathy for her companions. When Roger Fouts, her closest human friend, broke his arm, Washoe noted that he was “hurt” and requested him to come closer. She then offered Roger comfort by kissing his arm.

Kanzi

In my opinion, one ape stands at the forefront of ongoing ape-language work. Kanzi is a bonobo who produces and comprehends utterances made with human symbols. These symbols are called lexigrams—abstractions on a computer, such as a series of lines that looks something like a Japanese letter, which stands for “potato”; see examples at <http://www.iowagreatapes.org/bonobo/language/>. Kanzi comprehends a surprising amount of spoken English, as I found out when the psychologist Sue Savage-Rumbaugh invited me to meet him at Georgia State University (he now lives at the Great Ape Trust in Iowa). I brought Kanzi a ball, which I had hidden in the pocket of my blue jeans. I told him that I had a surprise for him. He went to his symbol



Kanzi working with lexigrams with Liz Robert-Pugh. Photo courtesy Great Ape Trust of Iowa.

board and guessed “Egg?” Unfortunately, I had not brought him something to eat!

Unlike Washoe, Kanzi was never explicitly tutored in language. He was present in the same room—though scampering around as infants will tend to do—when his mother took “language lessons” from researchers. It soon became apparent to Savage-Rumbaugh that Kanzi could use symbols appropriately, far more so than his mother. From that point on, Kanzi was treated by human caretakers not only as a thinking and feeling ape but also as an ape capable of participating in emotion-based cultural routines. He hiked in the woods, played games, and engaged in emotional interactions, as Par Segerdahl, William Fields, and Sue Savage-Rumbaugh explain:

“[Kanzi] acquired language in the context of climbing trees, tracking forest paths, searching, finding, preparing and eating food, chasing others and being chased, tickling and being tickled, frightening others and being frightened, pretending to bite others and pretending to be bitten, comforting others and being comforted, giving food to others and receiving it, being aggressive towards others and making friends again.”

It is arguable whether Kanzi has “acquired language” in its fullest sense. He does not, to cite an obvious instance, compose poetry or otherwise employ sophisticated concepts to weave stories about the past and the future. Nonetheless, Kanzi has shown the world of science that an ape nurtured in certain ways can blossom into a life of language-using, and that basic language skills are neither innate in nor specific to the human brain. Every year, Kanzi seems to make new strides. Segerdahl et al. now believe that Kanzi is trying to express words through speech, although his voice is hard for humans to understand.

Giving Apes Their Due

Is it any wonder that treating the apes as full social partners unlocks latent language learning, given that their natural grounding is in an emotional process within their own social groups?

What we learn about great apes impacts directly on our understanding of the process of becoming human. To the extent that certain characteristics of communication and cognition occur in African apes across species and also across living contexts—different populations both in the wild and in captivity—it appears increasingly likely that these characteristics already were in place in the common ancestor of great apes and humans.

This probability establishes an “evolutionary platform” from which our ancestors’ behaviors evolved. If the ape-like ancestors that gave rise to modern-day chimpanzees, bonobos, and gorillas were capable of empathy, perspective-taking, and meaning-making, as well as of aggression and violence, we might want to think seriously about how to research the emotional lives of early *Homo sapiens* and ancient humans.

The archaeologist Steven Mithen describes Neanderthals—those fascinating early people who hunted mammoth, buried their dead, and apparently went extinct from competition with *Homo sapiens*—in unconventional terms. Neanderthals, he writes, were “intensely emotional beings: happy Neanderthals, sad Neanderthals, angry Neanderthals, disgusted Neanderthals, envious Neanderthals, guilty Neanderthals, grief-stricken Neanderthals, and Neanderthals in love.” To project “love” into the past takes a cautious approach, to be sure, but to consider critically the subject, and how researchers might look for evidence of emotions, is warranted for a full evolutionary perspective on human behavior. In my most recent book, I have even suggested that ape and early-human emotion, communication, and cognition point us towards recognizing the deepest roots of what later became human religiosity.



Kanzi. Photo courtesy Liz Rubert-Pugh.

Recent research offers this critical message: that we desperately need a revolution in how we think about and treat the African great apes. It is tragically clear that we are in a race against time to learn more about apes in the wild—and to protect them. The triple whammy of habitat destruction, exposure to diseases such as ebola fever, and the bushmeat trade means that our closest living relatives are under unprecedented threat of extinction.

This threat brings with it intellectual worries. For almost half a century, thanks first to Jane Goodall, and then primatologists such as Christophe Boesch, William McGrew, Tetsuro Matsuzawa, and Andrew Whiten, we've known that chimpanzees in the wild make and use tools. For at least a decade we have been certain that chimpanzees are cultural beings: their tool-using, communication and other behaviors differ from wild population to wild population owing to learned preferences rather than aspects of innate biology, ecology or environment. But we are still learning so much more. Only last year did we discover, thanks to the research of anthropologist Jill Preutz at the site of Fongoli in Senegal, that chimpanzees fashion spears to hunt small prosimians in tree holes!

The highest and most painful costs of ape extinction do not relate to our loss of knowledge. It would be the loss of these thinking, feeling kin themselves. The African apes have shared so much of our evolutionary journey with us and have shown us fascinating glimpses of their own trajectory in the world of complex emotions, cognition, and communication. It is our responsibility to use the fruits of our own evolution to help our closest living relatives in their moment of peril.

Footnote

¹ Baraka was sent to a zoo in Omaha in 2004 to become the silverback of his own group. He returned to the National Zoo in late 2006 to take the place of Kuja and Mopie, the two silverbacks who died within two days of each other in the summer of 2006.

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Website: Bushmeat Crisis Task Force, www.bushmeat.org
Some of the links provide graphic photographs that may not be appropriate for younger students.

The material in this article is adapted from Barbara King's most recent books, *Evolving God: A Provocative View on the Origins of Religion* and *The Dynamic Dance: Nonvocal Communication in African Apes*.

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