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Friends With Benefits

By Carl Zimmer

Since 1995, John Mitani, a primatologist at the University of Michigan, has been going to Uganda to study 160 chimpanzees that live in the forests of Kibale National Park. Seventeen years is a long time to spend watching wild animals, and after a while it's rare to see truly new behavior. That's why Mitani loves to tell the tale of a pair of older males in the Kibale group whom the researchers named Hare and Ellington.

Hare and Ellington weren't related, yet when they went on hunting trips with other males, they'd share prey with each other rather than compete for it. If Ellington reached out a hand, Hare would give him a piece of meat. If one of them got into a fight, the other would back him up. Hare and Ellington would spend entire days traveling through the forest together. Sometimes they'd be side by side. Other times they'd be 100 yards apart, staying in touch through the foliage with loud, hooting calls. "They'd always be yakking at each other," says Mitani. (PHOTOS: Behind the Cover: Animal Friendships)

Their friendship--for that's what Mitani calls it--lasted until Ellington's death in 2002. What happened next was striking and sad. For all the years Mitani had followed him, Hare had been a sociable, high-ranking ape. But when Ellington died, Hare went through a sudden change. "He dropped out," says Mitani. "He just didn't want to be with anybody for several weeks. He seemed to go into mourning."

For evolutionary biologists and anthropologists, friendship has been considered one of the core traits of only one species of ape: us. The conventional thinking held that, along with our capacity to feel love, loyalty and compassion, our ability to forge long-term, meaningful bonds with friends set us apart. To the degree that nonhuman animals have exhibited such traits, they're really just making a genetic calculation. They'll protect family members, but only because they share so many genes. They'll help an unrelated member of their species too, but that's an even colder transaction known as reciprocal altruism: I'll do you a favor today, but I expect one in return tomorrow.

Humans do this kind of interpersonal ledger balancing too. It's not for nothing that if a friend lends you $10, you feel a faint sense of unease until you pay it back. If we didn't all feel that, Homo sapiens would not have become as cooperative a species as it is. But reciprocal altruism is to friendship as reproduction is to romance. In both cases, we start with a primal impulse and then embroider deep feeling into it. Animals, we've always told ourselves, do nothing of the kind.

Mitani and his colleagues now know better. Unrelated chimpanzees, for example, can develop strong bonds that last for years, and long-term studies by other researchers have revealed durable friendships beyond the chimp species. Dolphins make friends with unrelated dolphins, hyenas make friends with hyenas, and the same is true for elephants, baboons and horses. No one can say how many more species--mammals and others--will be added to the list.

True animal friendship is not about the neighborhood dogs' playing and wrestling when their owners take them to the park any more than true human friendship is about the pickup soccer game a group of kids play in an adjacent field. There's an improvised, on-the-fly quality to those interactions, and while they're sociable enough, they're limited to the moment. Animal friendship is about enduring bonds defined by sharing, sacrificing and, when circumstances warrant it, grieving. Not all animal friends exhibit all those behaviors, but they exhibit enough of them--with enough consistency--that something deep is clearly going on.

However widespread animal friendship is, it is changing our assumptions about how nonhuman societies work. It could also change the way we think about our friendships--and even about our health. It's well established that having close friends can contribute to a longer life and a lower incidence of disease, but it's never been easy to establish why. Studies of animals might provide some answers. Even before that work is done, though, one thing is clear: humans have always known that it's hard to get through life without friends, and it appears that animals are wise to that secret too.

Stalking the Wild Friend

In the field of animal-friendship research, charismatic critters like dolphins and chimpanzees get a lot of the attention, but it's baboons--far more distantly related to us than the great apes--that have provided some of the most powerful insights. In the late 1990s, UCLA anthropologist Joan Silk was working with Princeton primatologist Jean Altman on a long-term study of savanna baboons in Kenya's Amboseli National Park. At first, Silk and her colleagues focused on individual baboons, noting such things as their hierarchy in the troop and how often they were groomed by other monkeys. But then Silk wondered about the relationships among the individuals. Were they all the same, or did each baboon have different

relationships with different individuals?

Silk came up with a painstaking method for measuring the strength of the relationships between primates. She and her colleagues went back through their records and randomly selected hundreds of observations of each female baboon from years of fieldwork. Then they determined how often that baboon was sociable--sitting near another individual or grooming it, say--and noted which baboon was pairing off with which. When the scientists crunched the data, they discovered a complex social world they hadn't noticed before. "They have very strong relationships with some females and weak relationships with others," says Silk. In many cases, the strongest bonds were between unrelated females, and those lasted years. To describe these relationships, Silk, who arrived at the work as a skeptic of the whole idea of animal friendship, at last began to use what she calls the F word.

Other scientists conducting long-term studies of species noticed something similar going on. In 1970, Randall Wells, a biologist with the Chicago Zoological Society, began following bottlenose dolphins in Sarasota Bay in Florida, getting to know them so well that eventually he could distinguish one from another simply by the appearance of its dorsal fin. Over time, he discovered that some unrelated male dolphins spend considerable amounts of time together in pairs. "Usually they're swimming side by side," says Wells. "The rest of the time we'll see [them] alone, but they'll be back together again within a few hours."

Across a span of 40 years, Wells has been able to piece together the long-term history of these friendships. Male dolphins form their first friendships when they're young, and a pair will stay on good terms for years. If a male's friend dies, he will swim alone for a few months, but eventually he'll befriend another male.

Unrelated females do things differently. They spend time together during their fertile years, but these bonds are fluid, with individuals moving from one group to another in the bay. Only when they're in their 50s and no longer reproducing do female dolphins develop enduring bonds, and those are with just one or two other female friends.

One day in 2008, for example, Wells and his colleagues noticed that a 58-year-old female he named Nicklo had swum into the sea-grass meadows next to the lab. Dolphins sometimes go there to hunt the schools of mullet that frequent the shallow waters. As the mullet try to escape, the dolphin whacks them with its powerful tail, delivering a blow so hard it can launch fish into the air. A good fish whacking can leave a mullet stunned so the dolphin can make an easy meal of it.

But that day Nicklo was not whacking fish on her own. She was on the hunt with an unrelated old female named Black Tip Double Dip. The pair of dolphins drove the mullet schools from different sides, each whacking fish into the air.

Wells had rarely seen two female dolphins fish whacking together, but he began to see Nicklo and Black Tip Double Dip doing it more and more often. Sometimes they'd be joined by another old female named Squiggy. So much teamwork, of course, could simply be the utilitarian business of cooperative hunting: if three dolphins work together, all three eat better. But Wells and his colleagues would find the trio not just fish whacking but also simply swimming in tight formation, apparently keeping one another company. It's not quite The Golden Girls, but it's not all that different either.

As evidence for the F word piled up, the question shifted from "Do animals make friends?" to "Why do they bother?" The most obvious answer is that friendships boost reproductive odds. If having friends somehow leads to having more babies, the friendliness trait gets passed on, becoming more common across the species. For male dolphins, the reproductive benefit may come from a friend's playing wingman. A single male may have a hard time driving off other males while mating, but two males working together may be able to do the job. Females lean on one another more after their babies are born. A group of dolphin moms will often form circles around their calves, perhaps protecting them from predators. "We call them playpens," Wells says.

Silk looked for a similar reproductive benefit among the Amboseli baboons. She ran a new analysis, comparing the number of offspring a female had with her number of friendships. Here too there was a statistical baby bump. While female baboons with strong friendships were not necessarily likely to produce more young, the offspring they had were likelier to stay alive than the babies of females with shallower friendships.

The mechanism behind this wasn't clear, so Silk decided to team up with Robert Seyfarth, a primatologist at the University of Pennsylvania, and his wife Dorothy Cheney, who have studied friendships among chacma baboons in Botswana. For this study, the scientists looked at the longevity of the friendly adults. On average, they found, the survival rate to age 15 for female baboons with strong friendships is four times as high as that of those with weak ones. Long-lived mothers should increase the odds, at least in theory, for long-lived babies.

Silk's research has spurred other scientists to see what effects friendships have in other species. In New Zealand, Elissa Cameron of the University of Tasmania studies a population of 400 feral horses in the Kaimanawa Mountains. The horses live in bands that are typically not made up of close relatives. Sometimes the horses are aggressive. One might bite another or chase it away. But they can be sociable too. They run around together playfully. They use their teeth not to bite but to groom each other's manes. "Sometimes they stand with their heads resting on each other," says Cameron.

After collecting four years of data, she went through her records. She found that pairs of mares would establish strong bonds, and those bonds endured throughout her study. Cameron then did what Silk had done: she compared the strength of a mare's friendships to her reproductive success. And similar to Silk, she discovered that the more close friends a mare had, the more foals she could rear.

Never Mind the Genes

The principal explanation biologists always had for social behavior between unrelated animals is the favor-for-favor arrangement of reciprocal altruism. This would be particularly true among males, which don't have such a heavy investment in raising long-lived babies and thus would expect more immediate payback. There's little question that this plays a powerful role. But Seyfarth doesn't think animal friendship can be reduced to just a marketplace of immediate favors.

"In chimps, if you study them over a short period, you'd see a bit of meat sharing, a bit of cooperation on forming alliances," he says. But if you look at chimpanzee pairs that have established friendships, these favors are separated by long periods of time. "There are often many days or weeks that pass in between successive acts, so they can't be done for immediate benefit. Over six months, it's much more balanced, and over two years, it's more balanced still. Animals are happy to tolerate a temporary imbalance because what matters is the long-term relationship."

One of the most provocative implications of these studies is that friendships that evolved within species may sometimes reach across the species barrier. In her best-selling book Unlikely Friendships, journalist Jennifer Holland describes many such surprising pairs--a gorilla and a kitten, a cheetah and a dog, a hamster and a snake. YouTube, a decidedly more ad hoc source, is filled with clips of cross-species buddies.

But what you see onscreen may be less authentic than it seems. Barbara King, an anthropologist at the College of William and Mary and the author of Being with Animals, thinks a lot of these cases reflect wishful thinking more than actual friendships. "Right now the label is being applied far too broadly and uncritically," she says.

For King, it's not enough that two animals spend time near each other or greet each other enthusiastically. She'd use the term friendship only if the animals put some effort into their relationship--by grooming, for example. Few of the relationships that you can find online meet King's standard, even those in which a predator gets cozy with an animal that might ordinarily be prey. Predators aren't on the prowl all the time, King points out, and they use a lot of cues such as the size and fitness of potential prey to determine if it's worth trying to go for a kill.(This might help explain the popular on-line clip of a cat that seems to befriend a crow--a very large and very smart bird that would not succumb easily.)

Still, even King admits to being taken by the story of Mzee the tortoise and Owen the hippo. Owen was found as a 1-year-old alone and dehydrated near the coast in Kenya in 2004. He was put in an enclosure at a wildlife sanctuary with the 130-year-old Mzee. To the surprise of the park managers, the two animals became inseparable. They slept and ate together, and Mzee would sometimes lick Owen's face. King is especially impressed by how the two animals communicate. "Mzee nips Owen's tail to nudge Owen along on a walk. Owen nudges Mzee's feet when he wants to do the same," she says. "Owen's nudging is quite specific: he nudges Mzee's back right foot when he wants Mzee to steer right and the opposite for going left." Unfortunately, scientists can't draw any deep lessons from a single pair of animals. King speculates that the young Owen simply sought protection and comfort from Mzee. "The need for close contact can be very powerful," she says. "If that need isn't being met by one's own kind, more normal responses may be swamped."

Another question that studies of animal friendship inevitably raise is how all this applies to our favorite nonhuman species: dogs. Despite what we might suspect, the science so far does not rank canines very high on the friendship scale.

"Pet dogs do form friendship-type relationships with other dogs in the same household," says James Serpell, director of the Center for the Interaction of Animals and Society at the University of Pennsylvania. "Dogs that socialize regularly in dog parks also seem to prefer to hang out with particular preferred canine companions."

Appealing as such scenes of amiable play are, however, most scientists think they fall well short of true friendship. Echoing King, they note the lack of evidence in dogs of the constancy, reciprocity and mutual defense observed in species such as chimpanzees and dolphins. They also point out that dogs evolved from wolves or wolflike mammals, and scientists don't see friendships in wolf packs. Thanks to domestication, dogs have become capable of being sweet and loyal to humans, but it's likely that they treat us more as guardians than friends. Dogs are neither our best friends nor one another's--which is not to say they're not warm and wonderful company all the same.

Healthy Friendships

Studies of animal friendships may deepen our understanding of how complex the nonhuman world is, but there are more tangible benefits as well. The better we understand how friendships change an animal's physiology--improving its health in the process--the more we can learn about the power of those processes in ourselves.

Lauren Brent, a postdoctoral researcher at Duke University, is one of the leaders in this field. Brent conducts her work on a small island off the coast of Puerto Rico called Cayo Santiago that is home to about 1,000 rhesus monkeys. Brent spent four years on Cayo Santiago, carefully observing one 90-monkey group. Once she identified probable friend pairs, she wanted to determine if their relationships influenced their hormone levels--specifically glucocorticoids, which are produced in response to stress. Drawing the monkeys' blood would have been a stressful experience in itself, skewing the results. Fortunately, it's now possible to measure levels of hormones and other molecules from urine and feces.

"You just follow your monkeys around and wait for a sample to be deposited," Brent says. The only trouble came when the monkeys figured out what Brent was up to. They'd sometimes fight her for their feces. "Some of them just get possessive," says Brent. "I have no idea why."

It was worth the battle. Brent found that the amount of glucocorticoids in the rhesus monkeys varied with the strength of their social networks. When monkeys had strong friendships with a few other monkeys, their glucocorticoid levels were low. Less sociable types had higher readings. Seyfarth and his colleagues found similar results in baboons. When members of that species lose close family members, their glucocorticoids soar. They respond by making new friendships with other baboons, offering to groom them and perform other favors. Soon their hormone levels fall to normal. Research on nonprimates also lines up with these findings. In studies of domesticated horses outfitted with sensors, researchers found that when friends groom each other, their heart rate slows. Wells plans to study hormones in dolphins by taking tiny skin samples from them.

All these findings, of course, closely track what we know about friendship benefits in humans. Studies have shown that people with close social networks have lower blood pressure, lower levels of stress hormones and more robust immune systems than those without. In 2010, scientists at Brigham Young University analyzed data gathered from more than 300,000 people. They found that having poor social connections can raise the risk of premature death as high as that from a smoking habit and even higher than that from obesity.

If humans came late to the idea that other animals have the same capacity to form friendships that we do and derive the same benefits, it may be that we weren't paying attention. Chimpanzees and baboons, which both form long-lasting friendships, share an ancestor with humans, one that lived 30 million years ago. Maybe that monkey-like progenitor formed friendships with its troopmates, and maybe it inherited the ability from a still more distant mammalian grandparent. Even as we all diverged into multiple species, pursuing our very different evolutionary arcs, all of us--Nicklo the dolphin and Hare the chimpanzee and Bob, the guy who's been your best friend since high school--may have retained the simple but powerful ability to find one another and care about one another.

Zimmer, a lecturer at Yale University, is the author of A Planet of Viruses

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