

The Evolution of Empathy

We tend to think of empathy as a uniquely human trait. But it's something apes and other animals demonstrate as well, says primatologist **Frans B. M. de Waal**. He shows how our evolutionary history suggests a deep-rooted propensity for feeling the emotions of others.

ONCE UPON A TIME, THE UNITED STATES had a president known for a peculiar facial display. In an act of controlled emotion, he would bite his lower lip and tell his audience, "I feel your pain." Whether the display was sincere is not the issue here; how we are affected by another's predicament is. Empathy is second nature to us, so much so that anyone devoid of it strikes us as dangerous or mentally ill.

At the movies, we can't help but get inside the skin of the characters on the screen. We despair when their gigantic ship sinks; we exult when they finally stare into the eyes of a long-lost lover.

We are so used to empathy that we take it for granted, yet it is essential to human society as we know it. Our morality depends on it: How could anyone be expected to follow the golden rule without the capacity to mentally trade places with a fellow human being? It is logical to assume that this capacity came first, giving rise to the golden rule itself. The act of perspective-taking is summed up by one of the most enduring definitions of empathy that we have, formulated by Adam Smith as "changing places in fancy with the sufferer."

Even Smith, the father of economics, best known for emphasizing self-interest as the lifeblood of human economy, understood that the concepts of self-interest and empathy don't conflict. Empathy makes us reach out to others, first just emotionally, but later in life also by understanding their situation.

This capacity likely evolved because it served our ancestors' survival in two ways. First, like every mammal, we need to be sensitive to the needs of our offspring. Second, our species depends on cooperation, which means that we do better if we are surrounded by healthy, capable group mates. Taking care of them is just a matter of enlightened self-interest.

Animal empathy

It is hard to imagine that empathy—a characteristic so basic to the human species that it emerges early in life, and is accompanied by strong physiological reactions—came



Frans de Waal

An example of consolation among chimpanzees: A juvenile puts an arm around a screaming adult male, who has just been defeated in a fight with his rival. Consolation probably reflects empathy, as the objective of the consoler seems to be to alleviate the distress of the other.

into existence only when our lineage split off from that of the apes. It must be far older than that. Examples of empathy in other animals would suggest a long evolutionary history to this capacity in humans.

Evolution rarely throws anything out. Instead, structures are transformed, modified, co-opted for other functions, or tweaked in another direction. The frontal fins of fish became the front limbs of land animals, which over time turned into hoofs, paws, wings, and hands. Occasionally, a structure loses all function and becomes superfluous, but this is a gradual process, and traits rarely disappear altogether. Thus, we find tiny vestiges of leg bones under the skin of whales and remnants of a pelvis in snakes.

Over the last several decades, we've seen increasing evidence of empathy in other species. One piece of evidence came unintentionally out of a study on human development. Carolyn Zahn-Waxler, a research psychologist at the National Institute of Mental Health, visited people's homes to find out how young children respond to family members' emotions. She instructed people to pretend to sob, cry, or choke, and found that some household pets seemed as worried as the children were by the feigned distress of the family members. The pets hovered nearby and put their heads in their owners' laps.

But perhaps the most compelling evidence for the strength of animal empathy came from a group of psychiatrists led by

Jules Masserman at Northwestern University. The researchers reported in 1964 in the *American Journal of Psychiatry* that rhesus monkeys refused to pull a chain that delivered food to themselves if doing so gave a shock to a companion. One monkey stopped pulling the chain for 12 days after witnessing another monkey receive a shock. Those primates were literally starving themselves to avoid shocking another animal.

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The anthropoid apes, our closest relatives, are even more remarkable. In 1925, Robert Yerkes reported how his bonobo, Prince Chim, was so extraordinarily concerned and protective toward his sickly chimpanzee companion, Panzee, that the scientific establishment might not accept his claims: "If I were to tell of his altruistic and obviously sympathetic behavior towards Panzee, I should be suspected of idealizing an ape."

Nadia Ladygina-Kohts, a primatological pioneer, noticed similar empathic tendencies in her young chimpanzee, Joni, whom she raised at the beginning of the last century, in Moscow. Kohts, who analyzed Joni's behavior in the minutest detail, discovered that the only way to get him off the roof of her house after an escape—much more effective than any reward or threat of punishment—was by arousing sympathy:

If I pretend to be crying, close my eyes and weep, Joni immediately stops his plays or any other activities, quickly runs over to me, all excited and shagged, from the most remote places in the house, such as the roof or the ceiling of his cage, from where I could not drive him down despite my persistent calls and entreaties. He hastily runs around me, as if looking for the offender; looking at my face, he tenderly takes my chin in his palm, lightly touches my face with his finger, as though trying to understand

what is happening, and turns around, clenching his toes into firm fists.

These observations suggest that apart from emotional connectedness, apes have an appreciation of the other's situation and show a degree of perspective-taking. One striking report in this regard concerns a bonobo female named Kuni, who found a wounded bird in her enclosure at Twycross Zoo, in England. Kuni picked up the bird, and when her keeper urged her to let it go, she climbed to the highest point of the highest tree, carefully unfolded the bird's wings and spread them wide open, one wing in each hand, before throwing it as hard as she could toward the barrier of the enclosure. When the bird fell short, Kuni climbed down and guarded it until the end of the day, when it flew to safety. Obviously, what Kuni did would have been inappropriate toward a member of her own species. Having seen birds in flight many times, she seemed to have a notion of what would be good for a bird, thus giving us an anthropoid illustration of Smith's "changing places in fancy."

This is not to say that all we have are anecdotes. Systematic studies have been conducted on so-called "consolation" behavior. Consolation is defined as friendly or reassuring behavior by a bystander toward a victim of aggression. For example, chimpanzee A attacks chimpanzee B, after which bystander C comes over and embraces or grooms B. Based on hundreds of such observations, we know that consolation occurs regularly and exceeds baseline levels of contact. In other words, it is a demonstrable tendency that probably reflects empathy, since the objective of the consoler seems to be to alleviate the distress of the other. In fact, the usual effect of this kind of behavior is that it stops screaming, yelping, and other signs of distress.

A bottom-up view of empathy

The above examples help explain why to the biologist, a Russian doll is such a satisfying plaything, especially if it has a historical dimension. I own a doll of Russian President Vladimir Putin, within whom we discover Yeltsin, Gorbachev, Brezhnev, Krushchev, Stalin, and Lenin, in that order. Finding a little Lenin and Stalin within Putin will hardly surprise most political analysts. The same is true for biological traits: The old always remains present in the new.

This is relevant to the debate about the origins of empathy, especially because of



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Cognitive empathy, where one understands the other's situation, enables helping behavior that is tailored to the other's specific needs. In this case, a mother chimpanzee reaches to help her son out of a tree after he screamed and begged for her attention.

the tendency in some disciplines, such as psychology, to put human capacities on a pedestal. They essentially adopt a top-down approach that emphasizes the uniqueness of human language, consciousness, and cognition. But instead of trying to place empathy in the upper regions of human cognition, it is probably best to start out examining the simplest possible processes, some perhaps even at the cellular level. In fact, recent neuroscience research suggests that very basic processes do underlie empathy. Researchers at the University of Parma, in Italy, were the first to report that monkeys have special brain cells that become active not only if the monkey grasps an object with its hand but also if it merely watches another do the same. Since these cells are activated as much by doing as by seeing someone else do, they are known as mirror neurons, or "monkey see, monkey do" neurons.

It seems that developmentally and evolutionarily, advanced forms of empathy are preceded by and grow out of more elementary ones. Biologists prefer such bottom-up accounts. They always assume continuity between past and present, child and adult, human and animal, even between humans and the most primitive mammals.

So, how and why would this trait have evolved in humans and other species? Empathy probably evolved in the context of the parental care that characterizes all mammals. Signaling their state through smiling and crying, human infants urge their caregiver to take action. This also applies to other primates. The survival value of these interactions is evident from the case of a deaf female chimpanzee I have known named Krom, who gave birth to a succession of infants and had intense

The Terms of Empathy

What does “empathy” mean exactly, and how is it different from sympathy or other emotional experiences? Some scientists differ in how they use the term. Below is a list of definitions of empathy and related terms that Frans de Waal compiled with colleague Stephanie Preston for their 2002 review article, “Empathy: Its Ultimate and Proximate Bases,” which appeared in the journal *Behavioral and Brain Sciences*.

Emotional contagion: The creation of a matching emotional state in one individual, the subject, as a result of perceiving the state in another individual, the object. Sometimes, as in very young children, the distinction is lost between the subject and object—both are affected to a degree precluding appropriate helping responses.

Empathy: The subject has a similar emotional state to the object as a result of perceiving the object’s situation. Empathy preserves the distinction between self and other. The subject’s emotional state is partially focused on the other, often resulting in kind or helping behavior.

Sympathy: The subject feels “sorry for” the object as a result of perceiving its distress. This can be arrived at without a matching emotional response. Authors from before the 1950s often use the word “sympathy” for what is currently referred to as “empathy.”

Cognitive empathy: Apart from being emotionally affected, the subject cognitively understands the object’s predicament and situation. This implies perspective-taking and attribution. Cognitive empathy may be limited to the brainiest animals, such as humans, apes, dolphins, and elephants.

positive interest in them. But because she was deaf, she wouldn’t even notice her babies’ calls of distress if she sat down on them. Krom’s case illustrates that without the proper mechanism for understanding and responding to a child’s needs, a species will not survive.

During the 180 million years of mammalian evolution, females who responded to their offspring’s needs out-reproduced those who were cold and distant. Having descended from a long line of mothers who nursed, fed, cleaned, carried, comforted, and defended their young, we should not be surprised by gender differences in human empathy, such as those proposed to explain the disproportionate rate of boys affected by autism, which is marked by a lack of social communication skills.

Empathy also plays a role in cooperation. One needs to pay close attention to the activities and goals of others to cooperate effectively. A lioness needs to notice quickly when other lionesses go into hunting mode, so that she can join them and contribute to the pride’s success. A male chimpanzee needs to pay attention to his buddy’s rivalries and skirmishes with others so that he can help out whenever needed, thus ensuring the political success of their partnership. Effective cooperation requires being exquisitely in tune with the emotional states and goals of others.

Within a bottom-up framework, the focus is not so much on the highest levels of empathy, but rather on its simplest forms, and how these combine with increased cognition to produce more complex forms of empathy. How did this transformation take place? The evolution of empathy runs from shared emotions and intentions between individuals to a greater self/other distinction—that is, an “unblurring” of the lines between individuals. As a result, one’s own experience is distinguished from that of another person, even though at the same time we are vicariously affected by the other’s. This process culminates in a cognitive appraisal of the other’s behavior and situation: We adopt the other’s perspective.

As in a Russian doll, however, the outer layers always contain an inner core. Instead of evolution having replaced simpler forms of empathy with more advanced ones, the latter are merely elaborations on the former and remain dependent on them. This also means that empathy comes naturally to us. It is not something we only learn later in life, or that is culturally constructed. At heart, it is a hard-wired response that we fine-tune and elaborate upon in the course



Dugald Stermer

The building blocks of morality clearly predate humanity.

of our lives, until it reaches a level at which it becomes such a complex response that it is hard to recognize its origin in simpler responses, such as body mimicry and emotional contagion. (See sidebar.)

On a leash

Biology holds us “on a leash,” in the felicitous words of biologist Edward Wilson, and will let us stray only so far from who we are. We can design our life any way we want, but whether we will thrive depends on how well that life fits human predispositions.

I hesitate to predict what we humans can and can’t do, but we must consider our biological leash when deciding what kind of society we want to build, especially when it comes to goals like achieving universal human rights.

If we could manage to see people on other continents as part of us, drawing them into our circle of reciprocity and empathy, we would be building upon, rather than going against, our nature.

For instance, in 2004, the Israeli Minister of Justice caused political uproar for sympathizing with the enemy. Yosef Lapid

questioned the Israeli army's plans to demolish thousands of Palestinian homes in a zone along the Egyptian border. He had been touched by images on the evening news. "When I saw a picture on the TV of an old woman on all fours in the ruins of her home looking under some floor tiles for her medicines, I did think, 'What would I say if it were my grandmother?'" he said. Lapid's grandmother was a Holocaust victim.

This incident shows how a simple emotion can widen the definition of one's group. Lapid had suddenly realized that Palestinians were part of his circle of concern, too. Empathy is the one weapon in the human repertoire that can rid us of the curse of xenophobia.

Empathy is fragile, though. Among our close animal relatives, it is switched on by events within their community, such as a youngster in distress, but it is just as easily switched off with regards to outsiders or members of other species, such as prey. The way a chimpanzee bashes in the skull of a live monkey by hitting it against a tree trunk is no advertisement for ape empathy. Bonobos are less brutal, but in their case, too, empathy needs to pass through several filters before it will be expressed. Often, the filters prevent expressions of empathy because no ape can afford feeling pity for all living things all the time. This applies equally to humans. Our evolutionary background makes it hard to identify with outsiders. We've evolved to hate our enemies, to ignore people we barely know, and to distrust anybody who doesn't look like us. Even if we are largely cooperative within our communities, we become almost a different animal in our treatment of strangers. (See sidebar.)

This is the challenge of our time: globalization by a tribal species. In trying to structure the world such that it suits human nature, the point to keep in mind is that political ideologies by definition hold narrow views. They are blind to what they don't wish to see. The possibility that empathy is part of our primate heritage ought to make us happy, but we are not in the habit of embracing our nature. When people kill each other, we call them "animals." But when they give to the poor, we praise them for being "humane."

We like to claim the latter tendency for ourselves. Yet, it will be hard to come up with anything we like about ourselves that is not part of our evolutionary background. What we need, therefore, is a vision of human nature that encompasses all of our tendencies: the good, the bad, and the ugly.

Our best hope for transcending tribal differences is based on the moral emotions, because emotions defy ideology. In principle, empathy can override every rule about how to treat others. When Oskar Schindler kept Jews out of concentration camps during World War II, for example, he was under clear orders by his society on how to treat people, yet his feelings interfered.

Caring emotions may lead to subversive acts, such as the case of a prison guard who during wartime was directed to feed his charges only water and bread, but who occasionally sneaked in a hard-boiled egg. However small his gesture, it etched itself into the prisoners' memories as a sign that not all of their enemies were monsters. And then there are the many acts of omission, such as when soldiers could have killed captives without negative repercussions but decided not to. In war, restraint can be a form of compassion.

Emotions trump rules. This is why, when speaking of moral role models, we talk of their hearts, not their brains (even if, as any neuroscientist will point out, the heart as the seat of emotions is an outdated notion). We rely more on what we feel than what we think when solving moral dilemmas.

It's not that religion and culture don't have a role to play, but the building blocks of morality clearly predate humanity. We recognize them in our primate relatives, with empathy being most conspicuous in the bonobo ape and reciprocity in the chimpanzee. Moral rules tell us when and how to apply our empathic tendencies, but the tendencies themselves have been in existence since time immemorial.

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The Limits of Empathy

BY JASON MARSH

As Frans de Waal notes, it makes evolutionary sense that we more readily identify with—and feel more protective toward—people who seem like more immediate members of our family and community. What's more, unbounded, unconditional empathy could jeopardize a person's mental or physical health. If we truly felt the pain of everyone we encountered, we'd likely be incapacitated by emotional grief.

This seems especially true for members of "helping" professions, like teachers, police officers, and physicians. "It is tremendously satisfying to just connect and feel for and with a patient," said Eric Larson, the director of the Center for Health Studies at the Group Health Cooperative in Seattle. "But on the downside, it's work. And like all kinds of work, it can be done well and constructively, or it can be done to extremes."

In a recent article in the *Journal of the American Medical Association*, Larson argues that empathy is so important to high-quality caregiving that medical students and residents should receive long-term training in how to perform this "emotional labor." If they're not trained properly in how to manage their emotional workload, he says, they risk burning out.

"For physicians, this could lead to cynicism and real job dissatisfaction," he said. "People leave the field because they feel it's just too much work."

Under certain conditions, forms of empathy could jeopardize nonprofessional relationships as well. In a study of married couples, Texas A&M University psychologist Jeffry Simpson and his colleagues found that some spouses would feel threatened by negative thoughts and feelings their partners had about their relationship. If they were "empathically accurate" in reading those threatening thoughts, they felt less close toward their partner.

Simpson said that not being attuned to those threatening thoughts and feelings could benefit a relationship, especially when they stem from a spouse's temporary bad mood. There may be nothing a partner can do to change those feelings, and responding to them might only make things worse. But that's not always the case, he added.

"If it's something you can change, something that's going to reoccur, something that can be fixed—under those conditions, it's probably best to face the harsh negativity of your partner's thoughts," he said. "Take the short-term blow in order to solve the problem so it doesn't continue to occur."