

Do Humans Alone 'Feel Your Pain'?

By FRANS B.M. de WAAL

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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; being 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 we see them drown as 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 being able to mentally trade places with a fellow human being? It is logical to assume that the capacity to trade places came first, well before the rule was developed. It is even likely that the capacity predates our species. I have always been intrigued by the degree to which other large-brained mammals, like great apes and dolphins, share our empathic abilities. Stories of those animals' aiding others — even sacrificing themselves for others — abound, yet even if they provide the most striking examples by far, they are by no means alone. Charles Darwin noted in *The Descent of Man* that many animals, even those with smaller brains, sympathize with each other's distress or danger.

One piece of evidence in support of that claim 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. She found that some household pets seemed as worried as the children by the feigned distress of the family members. The pets hovered nearby and put their heads in their owners' laps.

Many people have no trouble ascribing empathy to dogs, but then we think of the dog as man's best friend. Rightly or wrongly, we give dogs credit for lots of human sentiments. In addition to television series like *Lassie*, we see a stream of books with titles like *Our Best Friends: Wagging Tales to Warm the Heart*.

But you wouldn't expect hard-nosed scientists to make similar claims about, say, rats, would you? We hardly think of those animals as sensitive and caring, and we use "rat" as a term for people we don't like. In 1959, however, a paper by Russell Church of Brown University appeared in the respectable *Journal of Comparative and Physiological Psychology* under the provocative title "Emotional Reactions of Rats to the Pain of Others."

Church's work inspired a brief flurry in the 1960s of experimental studies that investigated concepts like "empathy," "sympathy," and "altruism" in animals. To stay out of trouble, the investigators never forgot to place the topics of their research in quotation marks. Thanks in part to a taboo on the mere mention of animals' emotions, and in part to the traditional emphasis on the selfish, nasty side of nature, those studies have been ignored by subsequent generations of students. We would not repeat some of the experiments today for ethical reasons, but they demonstrated some astonishing effects.

Church trained rats to obtain food by pressing a lever. He found that if, while pressing the lever, a rat saw a rat in a neighboring cage being shocked, the first animal would interrupt its activity for a while. That result is remarkable. Why should the rat not simply continue to get food and ignore the other animal dancing in pain on an electric grid? The question is whether the rats that stopped pressing the lever were worried about their companions or fearful for themselves.

The explanation that Church proposed was typical of a time when conditioning was thought to underlie all behavior: Through past associations, a companion's distress makes a rat fear for its own well-being. Thus, in a later series of tests, Church first gave each rat and its neighbor shocks when the animal pressed the lever. After that experience, the rat was tested the same way as before, with each press of the lever dispensing food to the first rat while the second received shocks. Seeing the second animal's painful reaction to the shock now caused the first animal to stop pressing the lever for a much longer time. The investigator concluded that the distress of a companion calls up negative associations.

Now, that seems to me a fine explanation for what happened after the training, but does it tell us anything about the spontaneous reactions that Church documented in the beginning? Do untrained rats have any reason to associate the squeals of another with pain to themselves? The animals in the experiment had grown up in laboratories with controlled temperature and light, ample food, and no predators. It seems more likely that the sight of pain in another rat arouses an innate emotional response. As a species, rats probably evolved to pay attention to the emotions of their fellows, and to be disturbed by negative ones.

In 1962, also in the *Journal of Comparative and Physiological Psychology*, George Rice and Priscilla Gainer of Agnes Scott College reported that rats actually help each other. The researchers confronted rats with a companion in a highly uncomfortable situation: Strapped in a harness, hoisted off the floor, the companion wriggled convulsively and squealed. Without any special training, the rats were prepared to press a lever that lowered the companion to the floor. That "altruistic" response was not due to the animals' enjoyment of being able to move an object up and down; they did not press the lever if doing so merely lowered a Styrofoam block.

The researchers proposed a plausible explanation for the rats' helpful reaction: that the other animals' distress signals were unpleasant to watch and listen to, and that the rats lowered their bound companion to stop the signals. Indeed, the scientists reported that if the rat in the harness had been quiet and then squeaked, the other rat often pressed the lever immediately. Those experiments demonstrate that rats will deprive themselves of food, however temporarily, when they notice the suffering of another animal, and will work to reduce the other's distress. The animals are reacting spontaneously to emotional signals that are typical of their species. Of course, that doesn't mean that rats understand in any way what happens to the other animal, or that they help intentionally. It may just be that signs of pain in others disturb them. That would be a form of empathy known as emotional contagion: One rat's distress distresses another.

Emotional contagion may well be at the heart of all empathic responses. Scholars have argued that it is the cause of the fancy kinds of empathy that only we humans show. In our development, too, things start simple — for example, with the cry of a newborn when it hears others cry. I am familiar with a similar spreading of distress in very young rhesus monkeys. Once, when an infant had been bitten because it had accidentally landed on a dominant female, it screamed so incessantly that it was soon surrounded by other infants. I counted eight of them climbing on top of the poor victim, pushing, pulling, and shoving each other as well as the first infant. That obviously did little to alleviate its fright. The response seemed automatic, as if the other infants were as distraught as the victim and sought to comfort themselves as much as their companion. Increasingly, scientists assume that monkeys differ from apes and humans in that they are unable to look at the world from another's perspective. But that doesn't prevent them from being empathic, if empathy means being vicariously aroused by another's emotions. In the same period as the rat studies mentioned above, Robert Miller and his co-workers at the University of Pittsburgh tested monkeys in similar situations and noticed even stronger effects. In one study, reported in a 1963 article in *The Journal of Abnormal and Social Psychology*, a monkey could prevent shocks to itself and its companion by watching a video screen showing the other's face. The second animal could hear a click that announced the coming shocks. The first monkey, which could not hear the click, needed to interpret the facial expressions of the second and to press a lever when the expression warned of an impending shock. The monkeys were successful, showing excellent skills at face reading.

Perhaps the most compelling evidence for the strength of empathy in monkeys 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 refuse to pull a chain that delivers food to themselves if doing so gives 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, clearly a stronger reaction than that of the rats in Church's experiments.

In all of those studies, the most likely explanation of the rats' and monkeys' behavior seems to be what, in humans, is called personal distress. That means that the acts of apparent kindness are not based on a concern about the other's welfare but rather are a way of dealing with the distress of seeing the distress of another individual. For example, young children often get teary-eyed and upset — and run back to their mothers for reassurance — when they see another child fall and cry. They cry not because they are concerned about the other child, but because that child's emotions vicariously overwhelm them. It is only later, when children develop a distinction between self and other, that they learn to fully separate another's emotions from their own.

Is that perhaps the level at which monkeys operate? To answer that question, we need to know to what degree monkeys react to a situation in ways that are relevant to what is happening to another animal rather than to them. Let me describe a scene involving infant rhesus monkeys that I have witnessed many times at the Wisconsin Primate Center, in Madison. Rhesus monkeys have a particular staccato grunt called the baby grunt, which is usually given by females to a mother with a newborn. The grunting females are fascinated by the infant, trying to look closely at its face, touch it, or inspect its genitals. They also grunt in the same way to an infant that is walking around on its own, but then they often turn to look at its mother as well, thus indicating that they connect the two animals.

The scene I have in mind begins when an infant is distressed — for example, because its mother is starting the weaning process, or because it has been picked up by a juvenile who left it stranded somewhere, so that it is having trouble rejoining its family. A calling infant gets the attention of the entire group: Everyone stares in its direction and carefully watches any other monkeys that come close to it. The monkeys see a small crisis that needs to be resolved one way or another. If the

mother goes to retrieve the infant, or if the infant gets back to its mother on its own, the watching females utter a chorus of baby grunts, as if everyone is relieved that the drama has come to such a good end. I take the grunts as an indication that monkeys have a goal in mind for the mother and infant: They belong together.

A similar vocal indication of relief occurs in wild baboons, according to Robert M. Sapolsky. In *A Primate's Memoir: A Neuroscientist's Unconventional Life Among the Baboons* (Scribner, 2001), he tells the story of an infant born to a particularly clumsy mother, who was so bad at carrying her infants that they had to hold onto her tail:

"One day, as she leapt from one branch to another in a tree with the kid in that precarious position, he lost his grip and dropped ten feet to the ground. We various primates observing proved our close kinship, proved how we probably utilized the exact same number of synapses in our brains in watching and responding to this event, by doing exactly the same thing in unison. Five female baboons in the tree and this one human all gasped as one. And then fell silent, eyes trained on the kid. A moment passed, he righted himself, looked up in the tree at his mother, and then scampered off after some nearby friends. And as a chorus, we all started clucking to each other in relief."

Such observations indicate that monkeys are not just reacting to external signs of distress, like high-pitched calls and facial expressions, but rather take the entire situation into account. It seems to matter to them that a fallen infant scrambles up again or that a mother and infant are reunited, so much so that they vocally broadcast their reaction to the rest of the group. We should be careful not to overinterpret, of course. It may not mean that monkeys have a precise understanding of the needs and wants of others, nor that they are capable of figuratively standing in the other's shoes as we do with fellow human beings and movie characters. Nevertheless, we may see here the beginning of those processes.

The possibility that empathy resides in parts of the brain so ancient that we share them with rats should give pause to anyone comparing politicians with those poor, underestimated creatures.

Frans B.M. de Waal is a professor of psychology and the director of the Living Links Center at Emory University. His latest book is The Ape and the Sushi Master: Cultural Reflections by a Primatologist (Basic Books, 2001). This article sums up part of a forthcoming review of empathy by Stephanie Preston, a postdoctoral researcher in neurology at the University of Iowa, and Mr. de Waal in The Behavioral and Brain Sciences.

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