

ESSAY

Adventures In Good And Evil

What makes some of us saints and some of us sinners? The evolutionary roots of morality.

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It isn't surprising that the best-known experiments in psychology (apart from Pavlov's salivating dogs) are those [Stanley Milgram](#) ran beginning in the 1960s. Over and over, with men and women, with the old and the young, he found that when ordinary people are told to administer increasingly stronger electric shocks to an unseen person as part of a "learning experiment," the vast majority—sometimes 93 percent—complied, even when the learner (actually one of the scientists) screamed in anguish and pleaded, "Get me out of here!" Nor is it surprising that Milgram's results have been invoked to explain atrocities from the Holocaust to Abu Ghraib and others in which ordinary people followed orders to commit heinous acts. What is surprising is how little attention science has paid to the dissenters in Milgram's experiments. Some participants did balk at following the command to torture their partner. As one of them, World War II veteran [Joseph Dimow](#), recalled decades later, "I refused to go any further."

On second thought, ignoring the few people who did not fit the pattern—in this case, of throwing morality to the wind in order to obey authority—is not that surprising: in probing the neurological basis and the evolutionary roots of good and evil, scientists have mostly focused on the majority and made sweeping generalizations. In general, most people's moral sense capitulates in the face of authority, as Milgram showed. In general, the roots of our moral sense—of honesty, altruism, compassion, generosity and sense of justice and fairness—are sunk deep in evolutionary history, as can be seen in our primate cousins, who are capable of remarkable acts of altruism. In one classic experiment, a chain in the cage of a rhesus monkey did double duty: it brought food to the monkey who pulled it, but delivered an electric shock to a second monkey. After observing the effect of pulling the chain on their companions, one monkey stopped pulling the chain for five days and one stopped for 12 days, primatologist Frans de Waal recounts in his 2006 book, "Primates and Philosophers: How Morality Evolved." The monkeys "were literally starving themselves to avoid inflicting pain on another," he writes. The closer a monkey was related to the victim, the longer it would go hungry, which supports the idea that morality evolved because it aided the survival of those with whom we share the most genes. Darwin himself viewed morality as the product of evolution. But monkeys and apes, like people, have taken a trait that evolved to help kin and extended it to completely unrelated creatures. De Waal once saw a chimpanzee pick up an injured starling, climb the highest tree in her enclosure, carefully unfold the bird's wings and loft it toward the fence to get it airborne.

And the final "in general" is that people's ethical decision making is strongly driven by gut emotions rather than by rational, analytic thought. If people are asked whether they would be willing to throw a switch to redirect deadly fumes from a room with five children to a room with

one, most say yes, and neuroimaging shows that their brain's rational, analytical regions had swung into action to make the requisite calculation. But few people say they would kill a healthy man in order to distribute his organs to five patients who will otherwise die, even though the logic—kill one, save five—is identical: a region in our emotional brain rebels at the act of directly and actively taking a man's life, something that feels immeasurably worse than the impersonal act of throwing a switch in an air duct. We have gut feelings of what is right and what is wrong.

These generalizations are all well and good, but they get you only so far. They do not explain, for instance, why Joseph Dimow balked at Milgram's experiments. They do not explain why a Tibetan monk who had been incarcerated for years by the Chinese said (in a story the Dalai Lama is fond of telling) that his greatest fear during captivity was that he would lose his compassion for the prison guards who tortured him. They do not explain why—given the human capacity for forgiveness and revenge, for compassion as well as cruelty, for both altruism and selfishness—some people fall at one end of the moral spectrum and some at the other. Nor do they explain a related mystery—namely, whether it is possible to cultivate virtue through the way we construct a society, raise children or even train our own brains.

Saying that the brain is wired for both virtues and vices "tells us nothing more than what everyone already knew," says Alan Wallace, a Buddhist scholar and president of the Santa Barbara Institute for Consciousness Studies. "The important questions are what accounts for human variation in moral behavior? And are there ways to cultivate virtues?" Unfortunately, says Ernst Fehr of the University of Zurich, who has done pioneering work on the evolution of altruism and cooperation, there is precious little research on individual differences. "We know that women tend to be more altruistic than men on average, older people tend to be more altruistic than younger ones, students are less altruistic than nonstudents," he says. "People with higher IQs tend to be more altruistic/cooperative." However, there is little or no correlation between altruism and standard personality traits such as shyness, agreeableness and openness to new experiences.

That may be because altruism and its cousin, generosity, seem to reflect less who you are than what you see. The greatest barrier to greater generosity, at least in the wealthy West, is that "people think they're in a world of scarcity and living on the edge," says Christian Smith of Notre Dame University, who has studied what motivates people to give. "Consumer capitalism makes people feel they don't have enough, so they feel they don't have enough to give away." But obviously some people do give very generously. That may reflect something very basic. "Being taught that it's important to give and, even more, having that behavior modeled for you makes a big difference," says Smith. So does empathy, which may explain why panhandlers on my subway so often seem to do better with people who are scruffily dressed and struggling than with the pearls-and-pumps set.

Observing compassion and forgiveness can spur those virtues, too. But in these cases, whether you are likely to be forgiving or vengeful, compassionate or cold, may depend less on having a role model and more on emotion. A specific cluster of emotional traits seem to go along with compassion. People who are emotionally secure, who view life's problems as manageable and who feel safe and protected tend to show the greatest empathy for strangers and to act

altruistically and compassionately. In contrast, people who are anxious about their own worth and competence, who avoid close relationships or are clingy in those they have tend to be less altruistic and less generous, psychologists [Philip Shaver](#) of the University of California, Davis, and Mario Mikulincer of Bar-Ilan University in Israel have found in a series of experiments. Such people are less likely to care for the elderly, for instance, or to donate blood.

Intrigued by the growing evidence that the brain can be altered by experience in fundamental ways—a property called neuroplasticity—Shaver wondered if it would be possible to induce feelings of security and self-worth, thereby strengthening the neural circuitry that underlies compassion and altruism. "If only people could feel safer and less threatened, they would have more psychological resources to devote to noticing other people's suffering and doing something to alleviate it," says Shaver, who as a young man considered entering the priesthood.

To find out, he and Mikulincer had volunteers watch a young woman perform a series of unpleasant tasks. "Liat" looked at gory photographs of people who had been severely injured. She pet a rat. She immersed a hand in ice water. And then she faced the prospect of petting a tarantula. After making a valiant attempt, she whimpered that she couldn't, begging that "maybe the other person can do it." Explaining that the experiment had to continue, the scientists asked a volunteer if he would trade places with Liat (who was actually part of the study). The responses confirmed Shaver's hunch. Volunteers who were trusting and secure in their own skin were four times more likely to swap places as those who were anxious and insecure. Even inducing this sense of trust and security made people more likely to help Liat. "Making a person feel more secure had this beneficial effect," says Shaver. "It worked on everyone." It was an intriguing hint that virtue could be boosted by altering people's emotions.

The Tibetan monk who worried that he would grow to hate his Chinese captors has not had his brain scanned for clues to what accounted for his compassion, but others have. Encouraged by the Dalai Lama to lend their brains to science, Buddhist monks have made regular treks to the University of Wisconsin. There, psychologist Richard Davidson uses fMRI to compare activity in the brains of monks who practice Buddhist compassion meditation (a deep, sustained focus on the wish that all sentient beings be free from suffering) to that in the brains of volunteers who do not. One difference leaped out: heightened activity in regions involved in perspective-taking and empathy—not just during meditation, when you'd expect it, but when the monks viewed pictures of suffering, such as an injured child. "It seems that mental training that cultivates compassion produces lasting changes in these circuits, changes specific to the response to suffering," says Davidson. "The message I've taken from this is that there are virtues that can be thought of as the product of trainable mental skills."

Rewiring the brain to strengthen the circuits that underlie virtues obviously can't explain all the differences between people in their levels of altruism, compassion and willingness to forgive. Meditation, after all, remains a niche activity. But ordinary, everyday experiences leave footprints on the brain no less than effortful mental training does. Dimow attributed his refusal to torture his unseen partner in the Milgram experiment to being brought up in a family that was "steeped in a class-struggle view of society, [which] taught me that authorities would often have a different view of right and wrong than mine," and to his Army training, when "we were told that soldiers had a right to refuse illegal orders."

Psychologist Michael McCullough of the University of Miami calls such experiences "learning histories," and he suspects they explain much of the difference between people in their willingness to forgive and their desire for revenge. In his 2008 book "Beyond Revenge: The Evolution of the Forgiveness Instinct," he argues that both forgiveness and revenge "solved critical evolutionary problems for our ancestors." Forgiveness helps to preserve valuable relationships. Exacting revenge acts as a deterrent against attacks, cheating or freeloading. It also establishes the revenge taker as someone not to be crossed, preempting future attacks. "We have blueprints in the brain for both revenge and forgiveness, and depending on our circumstances as well as our life histories, we are more likely to use one or the other," says [McCullough](#). "By the time I'm an adult, my history of being betrayed, violated, having my trust broken—or their opposites—pushes me toward a strategy tuned to the circumstances of my development."

When people can count on the rule of law to punish infractions, they are less prone to seek personal revenge. Conversely, when society lacks a mechanism to defend people's rights, "parents teach their children to cultivate a tough reputation and not let anyone get away with messing with them," McCullough says. But there is also what he calls an "effortful path to forgiveness. More recently evolved parts of the brain might exert top-down control over the emotional regions" that otherwise compel vengeance—probably something similar to the mental training that the Buddhists undergo. After a gunman took Amish schoolchildren hostage in 2006, killing five girls, the community said they not only forgave the killer, they also donated money to his widow. "Evolution favors organisms that can be vengeful when it's necessary, that can forgive when it's necessary and that have the wisdom to know the difference," says McCullough. If scientists can fathom the roots of the differences between sinner and saint, maybe more of us can move into the latter group.

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