



NEUROSCIENCE

A Quest for Compassion

Guided by a passionate leader, a new research institute hopes to draw lessons from Buddhism to study altruism and make the world a better place

Back in 2000, James Doty was living the high life. He drove a Ferrari to work and was in the process of buying a private island in New Zealand, a villa in Tuscany, and a penthouse apartment in San Francisco. A neurosurgeon turned biotech investor, Doty had amassed more than \$70 million, at least on paper. At 45, he was planning to retire, donate a large chunk of his fortune to charity, and divide his time between his three idyllic homes while doing medical volunteer work in developing countries.

Last month, Doty was standing behind a lectern at Stanford University in Palo Alto, California, explaining how he'd lost it all in the dot-com bust. "Within 6 weeks, I was \$3 million in the hole," he said. He kissed the island, villa, and penthouse goodbye. But he decided, against the advice of friends and family, to follow through with stock donations that he'd promised before the crash to a handful of universities and health charities. (By holding on to the stock until the market recovered, the recipients ultimately received nearly \$30 million.) Doty says that losing his material wealth made him more reflective. "Becoming completely detached from something you think you need is an interesting exercise," he said, his voice catching with emotion. "What you realize is ... it doesn't define you as a person." His face flushed, he seemed unable to continue. Uncertainly at first, people began to clap.

It was an unusually personal speech for an academic conference, but it was also an

unusual conference. The audience included psychologists, philosophers, economists, neuroscientists, and theologians who'd gathered for 2 days to inaugurate a new center at Stanford for the scientific study of compassion. Doty is the co-founder and director, and he provided \$150,000 to get it started. The program has also received \$1 million each from two Silicon Valley investors and \$150,000 from the Dalai Lama, the most he has ever contributed to a research project.

The new Center for Compassion and Altruism Research and Education (CCARE) will study the biological roots of benevolent behavior and investigate whether mental exercises derived from the centuries-old tradition of Buddhist compassion meditation—but stripped of religious trappings—can foster compassion in nonbelievers. Doty says he is not a Buddhist and does not meditate, but he thinks such exercises could find many uses. Earlier this year, for example, he flew to Washington, D.C., to talk with military leaders about treating frontline medics and chaplains suffering from "compassion fatigue"—a form of traumatic stress brought on by caring for traumatized soldiers.

Doing good science in this area is tricky business, cautions CCARE co-founder William Mobley, a neurologist and soon-to-be head of the neurosciences department at the University of California, San Diego. On one hand, Mobley says, there's the risk of researchers' personal beliefs interfering with

their objectivity. "Scientists are supposed to be professional skeptics, but there are people in the field ... whose only interest is seeing God's face." And then there are experimental limitations, such as having to rely on first-person accounts of what's going through someone's mind during meditation. Even so, Mobley says, scientists who dismiss such work out of hand—and he has heard from plenty of them—are misguided. "Nothing is off-limits to science and critical thinking," he says. "We don't have great tools, but they're good enough to get started."

Defining compassion

One starting point for scientific inquiry is a clear definition of the object of study. Yet the recent CCARE meeting made clear that compassion is hard to pin down. If the participants had chosen, they might have drawn up a Venn diagram of overlapping terms—sympathy, empathy, and altruism, to name a few—preferred by scholars from different disciplines. Although most participants seemed receptive, the juxtaposition of science and faith wasn't to everyone's liking. "All of this quoting His Holiness left and right makes me a little queasy," grumbled one scientist.

Indeed, the meeting got off to a spiritual start with a haunting cello solo, *The Invocation for World Peace*, played by its composer, Michael Fitzpatrick, who has performed for the Dalai Lama. Thupten Jinpa, a former Buddhist monk who has been the principal English translator for the Dalai Lama since 1985, then described the long history of examining compassion in philosophy and religion and urged scientists to "approach the field with openness and perhaps humility." Central to the Buddhist concept of compassion, Jinpa explained, is the belief that the

Source material. A new center for the study of compassion and altruism aims to draw lessons from Buddhist teachings.

capacity to feel—and wish to relieve—the suffering of others is inborn. The ability to feel compassion for family and loved ones comes naturally, but people must deliberately cultivate compassion for wider “circles of concern,” Jinpa said. “The highest form of compassion transcends all boundaries and embraces all sentient beings.”

Psychologist Paul Ekman, a professor emeritus at the University of California, San Francisco, whose pioneering work on facial expressions and body language was the inspiration for the new TV series *Lie to Me*, spoke of the “amazing coincidence” between Charles Darwin’s views on compassion and morality and those of Buddhism. Ekman noted that in *The Descent of Man*, Darwin wrote that one of humankind’s noblest virtues “seems to arise incidentally from our sympathies becoming more tender and more widely diffused, until they are extended to all sentient beings.” Ekman recounted reading the passage to the Dalai Lama (with whom he co-authored a book last year on emotion and compassion). When he was sure he had understood correctly, His Holiness declared: “I am a Darwinian,” Ekman recalled.

Ekman also noted that Darwin’s observation that the sight of suffering causes pain in those who observe it meshes well with the Buddhist notion that compassion involves feeling the suffering of others as unbearable. The idea also has a parallel in the research of cognitive neuroscientist Tania Singer of the University of Zurich in Switzerland, who reviewed her studies showing that brain areas involved in pain perception also respond when people observe another person wince from an electric shock (*Science*, 20 February 2004, p. 1121). Singer described newer evidence that one particular area, the anterior insula, has a key role in empathy. But, she added, such work points to a neural mechanism for just one facet of compassion, which, by most definitions, requires not just recognizing suffering in others but feeling compelled to do something about it.

The latter motivation appears to be innate, said Felix Warneken of the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany. He showed videos of experiments in which children as young as 18 months spontaneously came to his aid as he pretended to struggle with various tasks—reaching for a marker he’d dropped on the floor, for instance. Even chimpanzees sometimes give unsolicited help, Warneken and

colleagues have found (*Science*, 3 March 2006, p. 1301), suggesting that spontaneous altruism is not uniquely human.

Philosopher Owen Flanagan of Duke University in Durham, North Carolina, prompted a lively discussion by asking whether compassion might be overrated. Contemporary moral philosophers and psychologists have suggested that morality comprises different modules (*Science*, 18 May 2007, p. 998), and Flanagan argued that putting too much emphasis on any single module, such as compassion, at the expense of others, such as a sense of fairness and justice, may not be in a society’s best interest.

Translational meditation

Doty, whose life has cast him in the roles of both benefactor and beneficiary, is certain that more compassion would be a good thing. “I grew up in poverty and had a mother who was an invalid and a father who was an alcoholic,” Doty said in a recent interview at his



Promoting humanity.
James Doty’s research goals spring from his life experience.

office at El Camino Hospital in Palo Alto, where he is again a practicing neurosurgeon. When he was 13, a local woman befriended him and taught him to meditate, which he says gave him the confidence and sense of control he needed to achieve his considerable professional and financial success. Having attained that mental fortitude, Doty says he stopped meditating in college.

After hearing the Dalai Lama speak at Stanford in 2005 on a panel with several scientists organized by Mobley, Doty decided he wanted to foster more research in this area. After many discussions with other researchers, he and Mobley launched CCARE in January.

Several pilot studies funded by the project are getting under way, including a brain-imaging study with novice and expert meditators and a collaborative study between neuroscientists and economists that will be among

the first to investigate the effects of charitable giving on its recipients—in this case undergraduate students who receive financial aid.

Stanford psychologist Jeanne Tsai recently completed a CCARE-funded study on a compassion-training protocol developed by Jinpa, who is currently a visiting scholar at the school. Undergraduate students without extensive experience with meditation or Buddhism took a weekly, 2-hour course in which they first learned meditation basics such as posture and breathing techniques. Next, over the course of 6 to 8 weeks, a trainer instructed them to picture a loved one as vividly as possible and concentrate on the sense of concern they feel for this person’s well-being. In later sessions, they envisioned people they knew less well or even disliked and gradually expanded this concern to them.

Tsai randomly assigned 100 willing undergraduate students to receive the compassion training, training in mindfulness meditation, or classes in improvisational theater—to control for the possibility that simply learning a new skill or engaging in a new social activity is enough to elicit acts of kindness. (Volunteers were told they’d be participating in a study to evaluate several classes thought to improve physical and mental health.) Online questionnaires probed for changes in things such as empathic concern and the tendency to take another person’s perspective. Participants also kept a daily diary of “positive and negative events,” which the researchers are now combing for evidence of an uptick in compassion acts.

At the end of the experiment, participants read a letter written by a prisoner seeking correspondents and were given an opportunity to write back and/or donate money to a program aimed at stopping abuse inside prisons. Tsai says her group is now analyzing the data to see whether people who got compassion training wrote or donated more than those who didn’t.

A similar study is getting under way to investigate whether compassion training for medical students might improve their bedside manner. If it works, it would illustrate Doty’s greatest hope for CCARE: to take a centuries-old religious practice and extract from it a set of mental exercises with no religious overtones that can be scientifically proven to change the way people treat each other. It’s a tall order, but without passion like Doty’s, it wouldn’t stand a chance.

—GREG MILLER