

What Science Taught Me About Compassion, Gratitude and Awe by Dacher Keltner

[Below is a transcript of a talk that Dacher Keltner delivered at an Awakin Circle in Santa Clara, CA. As a world renowned psychologist and researcher, Dacher is credited with expanding the field of science to include emotions like compassion, gratitude, and awe. As the author of many books and over 100 papers, he has offered thought leadership that can shift our cultural narrative towards kindness and care. As an advisor to companies like Facebook, he has applied his research into systemic implementations. As the founder of Greater Good Science Center at UC Berkeley, he has started many projects that put these insights into the societal circulation. His most recent course on 'Science of Happiness' has been taken by 360 thousand students. And those who know him personally would tell you about his infectious smile. :)]

Thank you, Harshida and Dinesh, for hosting this event. I've always wanted to come here and just haven't had the chance, so it's great to be with all of you.

I'll land on some science that I think would be really interesting to the ServiceSpace community, but I first wanted to give you a little bit of a personal journey about how I got there. I'm also at an age in the middle of life where you think back to, "Why are you sitting here in this chair thinking about the narrative that gets to this moment."

I was really lucky to grow up with a couple of parents who were very experimental and very open to radical ideas and new ideas.

My mom was a literature professor and a social activist. I think if I were to say what she really got me interested in -- in addition to things like yoga and massage and alternative foods in the late '60s when people just didn't do those kind of things -- was compassion. To this day, she is interested in the sectors of our society that suffer and the nature of human suffering and volunteering in prisons and teaching people who don't have access to things like that. She was a literature professor, and as Molly, my wife, who's back there, will tell you, my mom is sort of steeped in the humanities where proof isn't as important as interesting discourse. I think in many ways, she was interested in consciousness, because she studied Virginia Woolf, who was one of the great Western experimenters of human consciousness in the written word.

Then, my dad was just as experimental. He was an artist. Ever since I was a young kid, I would find sanctuary in museums and look at paintings. I remember some of my most early compelling experiences were looking at paintings by the Dutch masters or Jan Steen or just looking at how they portray human joy, and just looking carefully at the aesthetic portrayal of emotion. Again, my dad was an artist.

In this very unusual home that was full of these radical ideas, I was a born scientist. In

first grade, I got second prize in the cake-baking contest, with my cake that was a Tyrannosaurus Rex. All these young girls got first and third and fourth prizes, and I claimed second prize with a little cake of the Tyrannosaurus Rex. I loved dinosaurs. I pathologically used to keep track of scores of baseball. For a year, I played solitaire and wrote down every outcome of every hand that I got. I had them in little booklets.

My mom would float these ideas, like pyramids have magical powers and can recharge batteries. You may remember this kind of thinking. As a little fifth grader, though, I tested those ideas. I built pyramids and grew snapdragons in them and compared them to control conditions. My mom's like, "What are you doing?" I'm like, "I'm testing this, Mom." I just couldn't help myself. I gravitated to science and math and those kinds of things, even though I looked like a surfer. I am a terrible surfer, but I was good at math. That was the deep personal and intellectual background to where I ended up heading as a young scientist.

Today, I want to talk about what we've learned scientifically, about compassion, gratitude and awe. But first, I want to share the origins of those interests for me.

After graduate school at Stanford, I did a postdoc with a fellow named Paul Ekman, who many of you may have heard about. He was a pioneer. In the mid-'60s, he devoted seven years of his career to figuring out how to code every visible facial muscle movement by changes in the appearance to the face. It took him seven years. No one had even gotten close to this kind of systematic characterization of what happens in the human face.

It was inspired by Charles Darwin, who wrote in 1872 *The Expression of Emotion in Man and Animals*, where he had really described how our emotions are mammalian. They aren't just humans, they aren't just Victorian, they are mammalian. Darwin drew upon his observations of his babies and his dog and chimpanzees at the London Zoo and other kinds of data to arrive at this notion that we have these mammalian emotions. Paul Ekman came along and really presented the science, this way of doing that work, of coding facial muscle movements.

What happens when you do that science, is you learn this coding system. It really changes your life, and it certainly changed mine. It takes about 100 hours to learn how to code the face. Then, it takes another couple of hundred hours of devoted work to really figure out how to use this system to differentiate fake smiles from real smiles, this muscle movement from that muscle movement. Thousands of combinations. I dove in as a young scientist, and I have coded more facial expressions than any human being alive, and it ruined my life in many ways. :)

What happens is you get these little windows into human nature. I think Darwin had that spectacular human eye which writers and painters have. You train this system up in your mind and you just start looking at human beings in a radically different way. You start to see these patterns of our emotion that trace back in mammalian evolution.

I remember one particular moment when I was a postdoc living in San Francisco, and I saw this mom pushing her daughter on a swing. I could tell that the daughter was struggling with a psychological condition, probably some deep form of anxiety, just by the tautness of her muscles. I was going to play basketball, and I caught it out of the corner of my eye, and I looked at them literally for an instant. Just the way the mom was pushing her on the swing, this young girl, and then her facial configuration. I knew that there was suffering in that family, just by this Darwinian microscope under the human face.

What that taught me is, and it really runs through as you'll see the science I'm about to describe to you, is that there are these little forms of mindfulness on the outside. We often direct mindfulness inside, but there's a social mindfulness of looking at other human beings that is fundamental to compassion and to community and the like. Once I saw that, I knew that I could figure out how our emotional gratitude, which we think of as very higher-order ethical concept, actually traces back to patterns of touch that you see in chimpanzees! Our moral ethical emotions have these deep origins. That changed my life, and has led to a lot of science.

The second thing. I was lucky in that my parents came at the world from very unusual philosophical angles. I wasn't raised in a religious background or a very conventional background at all. It was a very unconventional upbringing. My mom is, to this day, a little unusual in how she looks at the world, to my chagrin. I have to constantly negotiate that. My dad was really interested in Eastern philosophy. As a young kid, I was hearing about, in particular, Taoism and Buddhism, and read Lao Tzu early in life, and just heard a lot about Buddhism. That got me to question the standard Western model of human nature.

Psychological science, my discipline, comes from Freud and economic theory and self-interest and its philosophy of human nature comes out of Victorian England and Enlightenment philosophy of Northern Europe. It is arguably the most individualistic, isolationist form of culture that has ever existed in human history. Out of that philosophy come ideas like evolutionary theory and selfish genes that were designed just to be selfish. Out of that philosophy comes ideas about hyper-individualism, that I am entirely separate, bounded entity.

I was lucky because my dad (and my mom in different ways) was ushering me into Eastern thought. I studied a lot of it as a young kid and college student -- the idea of the Tao and the unfolding mysterious way that you can't describe with language, that transcends deliberative rational thought and all the great traditions of Buddhism. I remember, as part of my early career, I got to be among a small group of scientists who were interacting with Tibetan Buddhists (largely pioneered by Richie Davidson, who's a dear friend, and Paul Ekman, my former advisor). As a result, I got to be in on a couple of conversations with His Holiness the Dalai Lama.

During one of those early conversations, in Canada, we were talking about the evolution of compassion. And the Dalai Lama made a statement: "The human mind, at its default setting, is compassionate." For a Western scientist, that literally was an epiphany. It just shook everything in me. I'm like, "Well, what about self-interest, and what about selfish genes, and what about survival of the fittest, and what about ... Boy, compassion is vulnerable or exposes you to weakness."

As I dug into that thinking, it just led me to rethink who we are as a species.

That gets to the science, and I wanted to just talk about three highlights in this field that in part have come out of our lab.

Compassion. If you go into evolutionary thinking, which is my intellectual tradition that really comes out of Charles Darwin, evolutionary biology and the game theoretic approaches to pro-social behavior, compassion is hard to make sense of. The idea that you would feel very compelling concern for other people's suffering, sacrifice, expose yourself to exploitation or vulnerability out of this sentiment. In fact, there were early debates in evolutionary science about why we are pro-social or kind to others, and

the conclusions were, "Well, maybe it's a supernatural thing, it's built into us." That's Alfred Russell Wallace. It's built into us by supernatural forces. Then, there's the other perspective which prevails today, which is Thomas Huxley, who was an early advocate of Charles Darwin in Victorian England, that compassion is a social construct, that we're really selfish and base and greedy at our core. Compassion is this ethical principle that we invent as part of culture.

What our lab has done is chart the mammalian origins of compassion. We bring people to our lab in Berkeley, and other people are doing this work now. We'll show them images of suffering -- for example, kids with cancer or classic images of kids in a famine, really tough stuff to look at. What we find really requires us to revise our thinking about the human nervous system. We tend to think of the fight or flight branches of the nervous system, and that's the game, but in fact, when we show people these images of suffering, what we find is a very old part of the brain lights up called the periaqueductal gray. It's not the frontal lobes, where the empathy networks are, which is where the more recent developments of the human brain have been evolving. Rather, the periaqueductal gray is down near the brain stem. It's a very old part of the human brain and part of the mammalian nervous system.

What that tells us is, in the human brain, when we feel compassion, it's activating old, ancient regions of our nervous system. The periaqueductal gray, when you stimulate it in other mammals, triggers nurturant behavior and really non-specific nurturant behavior. If I trigger their periaqueductal gray in a sheep, it will take care of a cat. It just triggers this non-specific kindness, which is pretty cool.

Now, we have about 15 studies. If I see suffering, it activates my favorite part of the nervous system, which we've been obsessed with, which is the vagus nerve. The vagus nerve is this bundle of nerves that starts at the top of your spinal cord. It wanders through your throat. It activates muscles in your throat that allows you to look at people, make eye contact, which stimulates the release of oxytocin, and then it wanders down through your heart and your lungs and slows down your heart. It allows you to orient to people and take care of them. The vagus nerve continues to wander through your digestive organs and into your immune system. It's the largest bundle of nerves in the human nervous system. When you see the human nervous system mapped out, it's this big, long, freeway of neurons that goes from your brain to your body. It's the mind-body nexus. We now have about 12 replicated studies showing the vagus nerve supports compassion. When we feel compassion, when we act altruistically, if I vocalize in a compassionate way, the vagus nerve is activated. What that tells us is evolution began through different processes to craft this massive part of our nervous system that's about compassion. We've been designed to care.

Then, we can even push it back further in evolution, and this is where the literature on expression becomes really useful. I've been obsessed with the human voice, which is this amazing modality by which we communicate. We study these little thing called "vocal bursts," which are brief little sounds that we communicate emotion with. Here's a sound I hear from my teenage daughter. See if you know what emotion this is: "Pffft." You know right away, right? I did this sound to a bunch of government officials from Hong Kong, and they knew right away, "Oh, she's dismissive of you, or disgusted."

Okay, I'm going to count to three, and I want you to give me your best compassion sound. One, two, three.

Audience: Awwww.

Wasn't that pretty? That was really pretty. You guys even kind of harmonically went into song as you did that. I heard a little "wooo."

Indeed, when we capture these sounds and we get people to our lab and we say, "What would you sound like if you saw a young baby who was really suffering?" People are like, "Aww." We capture that acoustically as well as other sounds. I have students that are going to all over the world, remote Namibia to study the Himba. We have a project in eastern Bhutan where there's very little contact with the West. In this particular village in eastern Bhutan that takes days to get to, there's no electricity, no contact with the West; they hear these sounds, we ask them to tell us what emotion is being conveyed, and they know right away it's compassion. They haven't had any contact with any of our cultural forms, and they know that that's compassion. They know a lot of other emotions as well. It tells us this is part of a universal language of compassion.

It's even more amazing than that. Primatologists who are studying primates out in the wild have noticed that primates have these little sounds that communicate emotion, too. They have five or six categories of these sounds. One of them absolutely astounds me. It's the observation of Charles Snowdon. A lot of the great apes, when their babies die, the moms will carry the baby around for a long time. When you see photos of it, it is grieving. It doesn't surprise us. Holding it, nuzzling with it, keeping it on their body, skin-to-skin contact. What's stunning is, as the mom is carrying around the dead baby, other great apes in the vicinity will vocalize sounds that sound just like our vocalization of compassion. They're called little coos! It has a very similar acoustic structure.

You can take our sounds, very ancient -- they predate language by a long shot -- and trace them back in mammalian evolution to early forms of compassion in primates. Various people have been making the case that compassion is not an invention of human culture, it's a mammalian process. When the Dalai Lama says this is a basic setting of the mind, it's rooted in neuroscience and this evolutionary discovery.

Second stop is gratitude.

You know, in Western thought, there's been a lot of hostility towards emotions. Not so in Buddhism, where there are more sophisticated treatments of the varieties of compassion and equanimity and sympathetic joy than we've ever seen in the West. However, there is a subset of philosophers who really felt that the emotions were the glue of social living. Charles Darwin believed that sympathy was our strongest instinct. It's quoted in *The Descent of Man* from 1871. He came at that idea through his own experience of suffering watching his daughter Annie die of what looks like consumption. Emma, his wife, just couldn't handle the experience and Darwin literally, every day, was with his daughter until she died. Out of that, he realized sympathy and suffering are the driving force of the human psyche and really foundational to our survival.

Gratitude is another one of these moral sentiments in this philosophical tradition. Adam Smith, the economist, actually gets a bad rap in many ways, at least in the critics of economic thinking that often associate with him with pure self-interest. He had a much more nuanced view of human social organization. He called gratitude one of the most sacred beneficent virtues. There's this thinking in Western thought that dates back to Aristotle that we have these emotions, these passions, that make us virtuous, and

gratitude is one, when we feel how incredible the gifts are that are given to us. It's such a great exercise, to get people to start reflecting on gratitude and just to take a moment. I recently did this at San Quentin Prison where I go in for a restorative justice program, and these guys were talking about the privilege to learn and breathe and be with friends. It is this glue of the appreciative social community.

I'll tell you just a brief gratitude story, which I think blows apart Western conceptions of society and the individual within society. I have been really interested in tactile touch. Primates build up cooperative communities through touch. They groom each other about 15% to 20% of their waking hours. Their grooming isn't random, it really is about building friendships. They trade food systematically with other primates that have groomed them earlier in the day. If you were to make a map of a primate society, grooming would be the linkage between other primates. When primates, and this comes from my Power Paradox book, want to keep power and keep the group together, they do a lot of grooming. The alpha female and male will come up, and like, "Okay, you're on my side, right?" They groom away.

Now, our science had totally ignored touch, and I don't know why. The Western Victorian culture was not too friendly to human touch for obvious reasons. You know, when you think about it, we have this incredible hand that is spectacular and dexterous and much more adroit than chimpanzee hands, which are very simplistic in terms of what it can do. Then, our skin is an anatomical wonder. It is six to eight pounds. It's the largest organ in the human body. It has billions of cells. It has tiny little cells that we're just starting to figure out that process information about who's touching you, what is the intention behind that touch. Your immune system has networks of cells in your skin. It's not a mystery why, when you get a massage, you come out and you're like, "I feel stronger than I've felt in 20 years." That's because you just had your immune system massaged and it's firing on all cylinders.

In light of that, there's this amazing science that shows that if I give Nipun the right kind of pat to the back, reward circuits in his brain light. His stress response of cortisol and the sympathetic autonomic nervous system response calms down. He feels confident. School kids who are patted on their back are more likely to try hard problems on the blackboard.

We have gotten interested in, "Is touch this language of gratitude by which we convey our appreciation to other people?" The primate literature would suggest it definitely is, because that is their economy of alliances in trade, is grooming for food. "If you give me food, I groom you and I say thank you." Here's what we did in our Berkeley lab to test this idea. We brought people to the lab in twos. There was a barrier in the lab. One person arrives. We say, "Sit behind over there and stick your arm through a hole in this barrier." "Okay." "Thank you." Another person arrives, we give them a list of emotions, and we say, "See that arm over there? Try to communicate these emotions by touching that arm. There are ten emotions. Anger. That person has to guess, "That was angry." Compassion. What would you do? Yeah. They sort of stroke and soothe the hand, they go, "That was compassion." Gratitude, what would you do?

Most people do this clasp and shake, right? The person guesses what emotion just happened. Chance guessing in this experiment was 8.33%. They were able to detect compassion, love, and gratitude -- those are really intermingling concepts, when you think about it -- at about 60% accuracy. Seven times the rate of chance guessing! Just a little touch to the arm, and people can detect gratitude.

Couple of gender differences, though. When women try to communicate anger to the male arm, he had no idea what she was doing. I know. :) We replicated it. We all said, "I don't believe that." We replicated it, even in another country (Spain). Then, regrettably, when the male tried to communicate compassion to the female arm, she had no idea what was going on. Perhaps that doesn't hold up at an Awakin Circle like this. :)

One of the things that we've been really interested in, and this is where the next frontier of this science is going, is to think about how these expressions of gratitude build strong communities. In a couple different written pieces recently, and part of it was inspired just by talking with you, Nipun, about the viral power of these positive behaviors. There are several kinds of data that suggest that the more pro-social behaviors spread through social networks more rapidly and more virally.

It takes a certain kind of statistical sophistication in certain kinds of data, but we now can make the case for it. If I express gratitude to Nipun in the moment with a tactile expression, we know he will go on to other interactions and be more generous. Then, we know that those people whom he has touched will go on to other interactions and be yet more generous. My act of generosity here now transcending individual face-to-face contact is producing more generosity downstream. You can just project that out. These are very viral processes that build up cooperative networks, and there's a whole theoretical argument about that.

And last one I'll leave you with -- awe.

In many ways, when you read anthropology, there are origin stories in all human cultures, hunter-gatherer tribes on. Really, the quest for life and what we're here to do begins in these big experiences of awe, just where it may be out in nature. We're finding a lot of awe is in response to other people around the world. We have data coming in from 25 countries where awe very often comes from being around generosity. Amazing. We had students go to the Himba, who are, in a way, living in the conditions of our hunter-gatherer brethren and sisters, living in small groups in Africa with very basic existence with food and revolving around goats. We asked them to tell stories about what made them feel awe. I kept expecting art and cosmology and things of the sort, but they were like, "The generosity of other people." Just blew their minds, time and time again. That's kind of a rudimentary form of awe.

As I was about to launch into this science of awe or wondering what the next thing to study was in the emotion world, mapping out this taxonomy of emotions, I was in Bhutan with my dear friend, Lief. We were in a little village that revolved around these snow geese that migrate to Bhutan. They're big birds. The villagers see them, they name them, they each have individual identities. The whole village revolves around them, and they have this great relationship to them. They're these big, beautiful birds, and I think there are only 5,500 in the world. They migrate to Siberia.

As we were about to head to this monastery to visit this Buddhist monastery, people were telling us, "Well, you know, this monastery is special because when the birds migrate to Siberia, they fly up through this valley and they go seven miles away to this monastery, and then they fly around the prayer pole three times and then go off to Siberia." My friend and I are like, "I love these legends." You know, "Isn't this remarkable, what the human mind comes up with?" :)

We drive up this road through this canyon, and we hop in to see this monastery. We were

meditating a little, hearing the music and visiting -- and that was incredible in its own right. Then, all of a sudden, we start hearing these call of these birds, very loud calls. The monks, they get all their best instruments, they get into their prayer hall, they're chanting deep, low-octave chants with beautiful instruments. We're like, "What's going on?" And they said, "The birds are coming."

My friend and I are right there, and the birds come in a beautiful pattern, and they fly around the prayer pole three times, and, being the skeptical scientist, I documented each circumnavigation around the prayer pole. I was like, "Click, that's one, click, two, click three." Then, they go off to Siberia. I was like, "You're kidding me." It changed my life.

I think what we're starting to learn about awe (and this is E. O. Wilson's biophilia hypothesis) is that before industrialization, we had these deep understandings of nature and natural patterns. It told us a lot about where to find food and how to be safe. But this experience was one that took some scraping of my Western mind to go, "Oh my God, that's real." It was an incredible experience. I have photos to prove it!

The science of awe is, I would say, 25% of what we need to have a firm understanding of it. What we know is that awe really happens when you transcend the human scale, big or small, and when you're around things that challenge your current knowledge structures. You go, "Oh, I didn't imagine trees could be so big, or a baby could be so funny, or this person could be so generous, or music could sound like that."

We know, and we're building out practices around this, like walking out in woods, that just brief experiences of awe as short as a minute or two make you more generous, make you more humble, make you more empathetic, make you better at science. We have findings showing that it actually calms down the branch of your immune system called the cytokine system. The cytokine response is the inflammation response, when cells attack pathogens in your body and you feel like you have the flu. It's good in the short term if you have toxins in your body, but if your cytokine system is always active, it is very bad news for human health. Awe quiets down that system, which is really incredible. We're taking this work now with veterans who have PTSD and inner-city kids in Oakland and Richmond who don't get to get outside. We're finding that a day of rafting quiets cortisol and cytokine responses in these under-resourced communities.

We are starting to chart this evolutionary history of awe, and goosebumps are this weird response where we have these little muscles around hair follicles that contract in the back of our neck, and they give you that sensation of goosebumps. A lot of mammalian species have the piloerection response. Great apes do. They fluff up their fur. We're starting to do a review of the goosebump response in mammalian species. You can go all the way back to rodents, like rats. Rats piloerect to connect to other rats when they're facing something that seems uncertain or dangerous. It's this early signaling of "Let's bond together into collective to be strong." That probably will tell us a bit about the deep origins of awe and why we have this particular response to very collective processes.

Just to wrap up, these three emotions, compassion and gratitude and awe, I think they really tell us that human nervous system isn't just fight or flight. Sigmund Freud gave us a great legacy: the two great instincts are sex and death. We would say there's a little bit more than that, right? Then, they also tell us that a lot of the great delights in life come from serving others, that the human mind is wired up to do so. When you express compassion, you're getting this big rush of vagus nerve activation and

oxytocin. This feels great. When you show gratitude to somebody or sharing, similar studies show you get activation in rewards circuits in the brain. "I'm finding inherent delight in serving others." We'll find that with awe as well. We're about to engage in neuroscientific study.

The whole model of self-interest in separate individuals I think will fall by the wayside. That's what I wanted to say.

[Question and Answer Session]

Bill: I heard a radio program on the topic of mirror touch synesthesia. It's this situation where people are so empathetic that they actually physically experience the sensation that they see in others. Does that sound legitimate?

Dacher : Yeah, there are a variety of different demonstrations of this kind of mirroring of emotional response that, again, are part of this undermining of the assumption that we're all separate and different from others. Some of the famous studies were, if I get burned on my skin, a part of your cortex, the dorsal anterior cingulate cortex, lights up. That's the pain region, and it represents, "Wow, you're really feeling physical pain." If I see you get a physical burn on his skin, that same region in my brain lights up. If I see you be socially harmed, which is seemingly more remote than physical pain, that same region of my brain lights up. This kind of phenomenon is one of many different kinds of phenomena that are showing that my brain is very simultaneously representing many different experiences of other people. The skin boundaries are quickly broken by perception and brain representation.

Jennifer: If you watch the news, it's clear that some people clearly don't act from compassion. If it is so natural, why aren't people nice to each other all the time?

Dacher : Well, evolution operates on individual variability. That's kind of a canonical law in our field. And I've been really concerned about inequality. We are the most unequal culture in the industrialized world -- there's no comparison, in a variety of different metrics in terms of income and criminal justice system. We know now that inequality harms the nervous system in young kids, hyperactivates the cytokine response, and actually restricts brain growth in the frontal lobes. That kind of science, which I report upon in the Power of Paradox, led my lab to be interested in what are the processes that short circuit compassion? What we find time and time again is money, materialism, and inequality -- any combination of those social factors -- will basically turn off your compassionate response. I'm being a little dramatic, but we even have studies showing your vagus nerve won't fire when you see a child who's starving, if you think you're better than other people. I've been very interested in how inequality (in particular, structural inequality in people above me) really undermines the pro-social stuff that we study. For instance, inequality in money undermines gratitude. We have new data showing the wealthier I get, the less awe I experience. It is a very compelling problem to be thinking about today.

Speaker: Can we develop these qualities, like compassion and gratitude?

Dacher: Very much so, and that's why, if you go to the Greater Good Science Center, there are now these science-tested practices that help you build up compassion, help you build up empathy, help you build up awe.

Jonathan: I recently met a clinical psychologist, who was my Uber driver. He started telling me about his research at Yale on forgiveness, that he sees as a positive emotion. I wonder if you could comment on that.

Dacher: It is, and when I teach human happiness at Berkeley, I do the usual evolutionary story. It's so remarkable. Frans de Waal is the one who made the paradigm-shifting discovery here. He was studying rhesus macaques and chimpanzees, who could tear any one of us to shreds, with strong, big teeth. When they get into fights, the conventional Western European wisdom was that they should separate and go as far away from each other as possible. What Frans (who's Dutch, very egalitarian) observed, is that they do just the opposite -- that chimpanzees and macaques who are fighting each other actually reconcile! They will show gestures of succorance or weakness. They'll groom each other. They'll embrace. They'll present their rumps to each other and groom the rump. I wouldn't do that in human affairs. :) But what he said is we have this instinct to reconcile and to forgive, and that has these mammalian roots. He's subsequently done this with other species -- and all mammals reconcile in the heat of conflict except one? Cats. The cat does not reconcile. For all of you dog lovers, you're like, "I knew that." :) I had a bunch of cats growing up, and they never reconcile. They're like, "Fsst," and you'd be like "Ah," and then they'll walk away. What that tells us is that we have this capacity in the heat of conflict and harm to show weakness, to embrace, and to forgive. There are studies now in different labs that are exploring that in humans, where just acting, engaging in a mental contemplation of forgiving, will slow the stress response down. Fred Luskin at Stanford is doing really good work on forgiveness. It's a great question to explore.

Nihal: What is the impact this kind of research making in this society, and what steps can we take, in the East and West, that our social systems naturally promote this kind of cooperation between each other?

Dacher : If you study social organization in China and India in the last 20 to 30 years with economic expansion, almost necessarily comes individualism. Individualism is great. It often introduces self-expression and freedom of rights and so forth, but it has a lot of costs. It breaks down community. We've known that for 30 or 40 years, looking at the United States' culture. In some ways, Nipun is unusual, ServiceSpace is unusual. Most Western European Americans don't get this experience.

There is this transmission of economic values that moves through cultures, and we can see how it breaks down communities. When I was in Beijing five years ago and I taught a bunch of leaders for a day, they were describing to me social ills that were catching them by surprise that I have been looking at for 20 years in the United States. Like, "Well, now I live in a different part of the country than my wife, and I don't get to see my kids, and we're overscheduled, and we have no time off." I'm like, "Welcome to economic expansion individualism."

Lot of the foundations of this thinking, of rethinking self and service and compassion, really come from East -- Hindu and Buddhist scholars and Western and Eastern scientists dwelling in those traditions and doing a new kind of science that has challenged and reshaped Western conceptions of the human mind very deeply and convincingly. It's interesting, just to give you a little interesting history behind this, Charles Darwin, who's a very unusual scientist in saying sympathy is our strongest instinct, was deeply influenced by David Hume, who was this great Enlightenment philosopher. There is now historical speculation that David Hume was hanging around some monks that had had a lot of experience with Buddhism in his 18th century. Hume probably got these ideas

about kindness from Buddhism and transmitted them to Darwin, who then gave rise to this science.

I'm optimistic, overall. There's a good side to individualism: rights and self-expression. But we just need to rebuild the very important other side of communal life. That's what I'm really committed to with this science, and I do a lot of work at Facebook and Google and Apple to get them thinking about building real, deep, strong ties.

Nipun: Can you share a little bit about your work in the social network arena, because everyone who has been part of an online social network has been indirectly touched by your work?

Dacher: About four and a half years ago, Arturo ran a big wing of Facebook called what is now called "Protect and Care." They now even have compassion teams, which is really exciting. When they first brought us, we were some of the first lab scientists in this space. They've got 1.7 billion people connecting to each other, sharing information, and they're like, "What do we do?" We were like, "Well, here's how you can use the science of kind language and kind speech to build out more compassionate exchanges. Here's how you can use the science of compassion to think about better breakups on the site," which was a neat set of tools that they built. "Here's how you can use the science of kindness when somebody dies, to curate somebody's content on the site when they've passed away." There are several hundred thousand people a year who die and now have stuff on Facebook, and it's a complicated question about what you do with that. Then, we helped redesign emojis and emoticons and reactions. Moving from that, which people were like, "That's not emotional life," and now they've got a little "Whoa!" We're working on it. There's more in store.

Michelle: I've been around the world and I have a daughter who is half-chinese who is now entering the Wright Institute getting a doctorate in clinical psychology. My question is, how do you see this applying to how cultural groups react to other cultural groups? Very interested in the global human entity and the well-being of the whole.

Dacher : What a great question, Michelle. People like me and Josh Green, he's kind of a moral psychologist at Harvard, are often accused of being Pollyannish about the human nervous system. It's all good. Evolution also built into us problematic social tendencies like genocide, like rape, and there's an evolutionary argument for that us-them distinction. What we've learned is that the human brain responds to faces that are different than your own with a threat response. That is just part of our evolutionary heritage. We're in small groups, other groups that were different from us. There now is pretty clear data that there were at least six kinds of distinct hominids moving around when Cro-Magnon were moving around, in the context of our evolution, so we were bumping up against things that were similar to us, but dangerous and not of our own genes, if you will. We respond problematically. The challenge is to use these tools to attack that full-force. You see it in American politics today. That's why our science shows, wow, a little burst of awe in nature and you're more open to different cultures. A little loving-kindness practice once a day, which you can build into schools, suddenly your suspicions of different ethnicities drops. It is something that we can't assume is easy to transcend, and we've got to really move with force against.

Philippe: My wife's a doctor in positive psychology and one day, she told me something that I found very sad -- that people prefer sad news, sad stories over happy stories and happy news. Is that so?

Dacher : This is where science is really useful. There's this idea that the human mind likes or devotes more attention to bad stuff than good stuff. We like sad news more than good news. That was just an assertion with not a lot of data around it. I think what we're learning about the human brain is it responds just as powerfully to good things as to scary things. They're just separate systems in the brain that do that work. There are a lot of new data showing, for example, what's most viral through the transmission of news in social networks is what's awesome and kind. There are actually studies of what kind of New York Times stories get passed and clicked on, and it's more awe-inspiring that happened after this "bad is stronger than good" thesis. I think the human mind does both. We are very invested in knowing what's dangerous and worrisome, and so our news cycles devote a lot of attention to that, but we have a lot of reason to be invested in what's inspiring and good, and we spread that through social networks as well. It's both, as the answer.

Philippe: What is a big challenge ahead of you that you would love to be able to solve?

Dacher : If you were to do the big equation of what is harming the random individual, the world citizen, climate change is the first. Inequality is right up there, and it's intertwined with climate change, very interestingly. There is just this mounting science of, we are more of an egalitarian species, inequality imposes a lot of costs upon the human psyche. I think there are ten or twelve things we can do that are inexpensive and non-ideological that can help us take on inequality. Otherwise, there are just a lot of new data showing that a lot of the social ills in the United States, from bullying to gum disease to marital distress, come out of inequality. That's an important thing to tackle.

Vajia: Is there a connection between prayer and science of touch?

Dacher : You know, it's so interesting. In most cultures, acts of reverence and devotion involves self-touch, but they also involve postures that go down. Like bowing. Ironically enough, that kind of movement actually activates the vagus nerve. People are starting to think about the mind-body interface in these acts of reverence. They're not random. If you go to different parts of the world, we show our reverence in very similar ways, in our vocalization patterns. That's what we do with our bodies. Certain postures are very important to that process. There's probably some mind-body interface in that that has yet to be documented.

Bart: Have you seen that the impact of social media making us individualistic than before? And does more individualism lead to even lesser development of compassion and awe?

Dacher : I'll start with your second question first. What we find is individualism, thinking about money, materialism, and then inequality tend to short-circuit these emotions of compassion, gratitude, and awe. They diminish them in a variety of different kinds of studies. People have been worried about this for a long time, people like Robert Putnam, who wrote this famous book Bowling Alone, who showed that with individualism, you lose the emotions that tie us to one another. I think that is why I am worried about individualism like you.

Then, the effects of the new social media on our communal identities and our compassion are as yet, we don't know. We do know with rigorous data that Facebook connections matter. They aren't superficial. They aren't a different kind of relationship, they're just a weaker kind of relationship. We also know that, for about 75% of people, if you really intentionally do stuff on Facebook, it will give you boosts

much like a friendship would. That often counters a lot of stereotypes out in the broader society. I think that then poses the challenge for Facebook, which is how do you create an experience where you're sharing more vulnerable stuff, you're engaging in expressions of gratitude that are more powerful. It's a softer version of a face-to-face social network that will never replace it, and there's a lot of work to do. Part of it is we don't know.

Sairam: Have you explored intuition and gut feeling in your research?

Dacher : One of the really important developments that came out of this science of emotion that I'm part of is, for a long time, we've thought that a lot of the most important decisions we make are these rational, deliberative decisions. Scientists honestly believe that when we decide on punishing somebody or we decide on an economic policy or what candidate to vote for, we tally up all the costs and benefits and calculate probabilities and make our decisions. But that's just not how people move through the world. There's this whole new movement of Josh Green, Danny Kahneman and John Haidt, who is a friend of mine, in moral psychology showing that our gut is equipped, through evolution, with these deep reactions that guide our decision-making. When you get into a state of compassion, we have a whole line of studies showing it makes you see more similarities between people, it makes you more forgiving, you're less likely to be interested in retributive punishment. Jean-Paul Sartre has this great quote where he talks about how the gut feelings produce these magical transformations by which you look at the world. When you're in the compassionate mindset, it guides all kinds of decisions in very systematic ways, and that's true of other emotions as well. We have begun to think about feeling and intuition. It's a big literature.

Hemi: To build upon your observation with the primates and forgiveness, are there any techniques to reconcile quickly?

Dacher : Well, this is where we can really push the limits of human compassion, right? When I teach forgiveness to older audiences, I will most typically have somebody who's lost relatives in the Holocaust. Do you promote compassion and forgiveness in those contexts? You get into these really complicated extremes of forgiveness techniques, about how you work through that kind of harm. What we've learned in this comes through Fred Luskin's work, and there are these practical steps to forgiveness, about really grasping why the person harmed you, think through the forms of suffering that led to that harmful act, to kind of take a moment and recognize you're not going to have this clean view of them where they're restored to their original condition. But it's a more complicated view, and that's part of the story. Then, there are social practices that you can engage in that people put to practice in Rwanda and the Truth in Reconciliation Commission in South Africa, where it's about restorative justice -- which I work on in prisons, which is really expressing your grievances, listening and hearing with deep respect if you've been harmed, putting victim and perpetrator together. There are these techniques that are starting to spread that are yielding pretty good results.

Richard: I know some people who are very concerned about a retreat from face-to-face interaction into the digital world. Their concern is that maybe the emotional skills aren't developing, and the less people are able to function socially, the more they're going to retreat, and that when adolescence happens and all the hormones kick in, things go wrong pretty badly. I just wonder if you've had any thoughts or know any research or anything around this area.

Dacher : Yeah, a lot of people are really worried about it, and we don't have the empirical data yet. I alluded to some, which is, the key for kids is to use the new platforms intentionally and actively, as opposed to passively. If you go in and you think about, "This is a way I'm going to share some information that really matters to me via Facebook," that'll be a very meaningful experience, where you're transmitting political news or social news or the like. There are going to be contexts and certain individuals who really don't benefit from that kind of experience. Facebook means many different things in many different countries, right? In many parts of the world, it's the news, and it's how people understand what's happening in the world. In other parts of the world, it is how women bond together to fight against patriarchal violence, and that is well-documented. In the United States, it is, at its best moments, a foil or a countervailing force to loneliness. Twenty years ago, Americans faced an epidemic of loneliness. Literally, this was one of the central concerns in the social sciences -- that the average American teenager spends four to six hours a day by themselves, watching TV. Facebook has come in and replaced that with a different experience. We'll see where we land in terms of its benefits. I am a little bit more optimistic than most people, in that I think once it's designed right, it will connect us in a remote way, which is part of our human connection, but never replace face-to-face. We'll see. I may be dead wrong.

Bruce: What do you see as the relationship between these basic fundamental emotions that trace back to our history, our heritage, all the way back, and how those might come together in the narratives and stories that we construct around our lives?

Dacher : I'm giving a commencement speech at a high school tomorrow, and that's exactly what I'm going to say. I have a co-author of a textbook on emotion, Keith Oatley, who's also a novelist, prize-winning novelist, and a cognitive scientist. That's his thesis, and I think that's the best way to think about these passions that we've been talking about -- from beauty to awe to compassion to gratitude to fear to anger, probably 15 or 20 of them -- is that they're really stories. Anthropologists wrote a lot about this, that emotions are little dramas that you have. And we are all genetically shaped to veer towards certain emotions. Some of you may really feel that awe is a defining emotion. Others, compassion, others, gratitude or the like. What those experiences of those emotions do is they build up these big narratives of life. For me, compassion being something my mom gave me. They tell me that I have to be near human suffering and working on that to feel like I'm alive. I just have to. I just have to get into a prison and talk to people who are in solitary confinement or what have you, and that just is the narrative to my life. For others of you, it may be sensory beauty, right? All of your life will be organized around that passion, and that makes sense neuroscientifically, which is knowledge is stored within emotional structures, your emotions guide what you look at in the world. If you're an awe-prone person, you'll just see awe everywhere, right? You'll be like, "That chandelier and the patterns of light, and look at those shadows." The beauty person's like, "I don't get that. Can you hand me some more food." :) We don't have the great data on that, but I think that's where the field is going, is that these are the stories of life. Keith Oatley and other people have made this point that if you analyze the stories that are told around the world, they tend to be around certain emotions. There's the tragedies and the comedies and the inspiring stories, and the stories about injustice that at their core are driven by emotion.

Ron: I'm wondering if there's any empirical research on the potential impact of a national leader on the psyche of its citizens? You know where I'm going with this.

:)

Dacher : It's funny how upset we are in this very stirred-up time. I think that, frankly, with certain social conditions, economic, we've seen this little emergence in Western cultures of fascism. Fascism does have an emotional core to it that's been of the disgust of people who are different from you, fearmongering, and a bullying-type style. There are political scientists that talk about a national mood that we have, for very obvious reasons, which fluctuates in our feelings as a culture. I would worry about what happens if that particular leader were to win and what it would do to the psyche. It'd be an interesting thing to study.

Priya: Two years ago, I did one of the ten-day meditation retreats, and it was awe-inspiring. Then I started college, and I was in my dorm room trying to find ten minutes between classes to meditate, and it was a very different experience. Do you think there's a possibility of not even needing skin-to-skin contact, but something like vibrations in the air of being with other people that can have that kind of awe-inducing effect?

Dacher : Wow. What we do is that as I sit with you and you have your wonderful postures and smiles and beautiful looks in your face, that is just being absorbed by my nervous system and through the sensory information. You don't need skin-to-skin contact for a lot of good. You're proposing a more radical idea that right now is beyond what we know how to measure, although you could probably do certain kinds of capturing of magnetic rays or whatever it is, or someone would be there activating my vagus nerve. You will be a famous scientist if you make that discovery. :) Is it possible? I think so. I'm open to it. 90% of the universe is invisible and dark energy, so there are all kinds of processes that we don't measure or capture.

Gayathri: I feel that the self-interest is somewhat misdirected. Instead of greed, materialism, isolation, can it be focused on awe of our body?

Dacher : If I understand your question correctly, one of the things that I think this conversation brings into focus is where do we find delight and meaning in life. What's interesting about the human brain is we have a rewards circuit that delights and lights up and gives us pleasure for a lot of self-interested things: food and nice touch and intimate contact and friendship and music and the like. But, this new science that we've been talking about shows that we also are activating these self-interested networks in the brain by serving others, by sharing resources, by cooperating, by forgiving, by expressing gratitude, by feeling compassion. I think that the healthy mind is a nice balance of those forces. Your misdirection observation is really a statement about what we were worried about individualism, which a lot of you have talked about today. We take this very rich brain that can take delight in so many different things, and we zero it in on the Pottery Barn sofa. Right? We're like, "That is the key to my life." That is inevitably going to fail, so we've got to broaden it back out like you're suggesting, to direct it at the right causes.

[Applause]

I'll leave with a variation of a quote that my mom gave me of Percy Shelley, who's the great poet. This is a quote from "In Defense of Poetry," and I think it captures this really interesting, remarkable capacity of our human mind. "The great secret of morals is love, and a going out of our own nature and an identification of the beautiful that exists in thought, action, or person not our own." What Shelley is saying is the human

mind has this really incredible, unprecedented capacity to find beauty and delight in other people, and I think that that really is the core to tonight; to Nipun, my dear friend; and to being with you. Thank you very much.