

James Doty: The Magic Shop of the Brain by On Being

The following is the audio and transcript of an onbeing.org interview between Krista Tippett and Dr. James Doty.

DR. JAMES DOTY: Every time I'm in the position to open a person's skull, it's extraordinary in the sense that this is where we live. And what you see is these hills and valleys that are sort of pinkish, and you see blood vessels coursing over the surface. And there's a membrane where fluid is, and it's pulsating. And that pulsating is matching the rhythm of your heart. And to think that within that is who each of us is.

MS. KRISTA TIPPETT, HOST: Stanford brain surgeon James Doty is also a leading convener of research on compassion and altruism. He's on the cutting edge of knowledge of how the brain and the heart - understood both physically and metaphorically — talk to each other; and how we might even, as a species, begin to take charge of our tribal, fight-or-flight instincts — “the baggage of evolution.” The backstory of James Doty's passions is told in his memoir, *Into the Magic Shop*. In the summer of 1968, in the throes of a hardscrabble, perilous childhood, he wandered into a magic shop and met a woman named Ruth who taught him what she called “another kind of magic” that freed him from being a victim of the circumstances of his life, and that he now investigates through science. Practices like relaxing the body to calm the mind, of self-control and setting intentions, and compassion towards oneself and others. I'm Krista Tippett, and this is On Being.

[music: “Seven League Boots” by Zoe Keating]

MS. TIPPETT: As James Doty's memoir begins, he is a panicked, disheveled, and unsmiling adolescent — in part, because one of his teeth had been knocked out when he was a child, and grown back crooked and brown and his parents could not afford to fix it.

MS. TIPPETT: So, I almost always start my conversations by inquiring about the religious or spiritual background of someone's childhood. And, sometimes, it's a story of a religious upbringing. It really occurs to me as I read your story that the spiritual background of your childhood had a lot of despair and deprivation in it, and the spiritual fallout of that. How would you start to — that question about the spiritual background of one's childhood is not necessarily a sweet, spiritual thing.

DR. DOTY: I think you're right. I think, for many people, what brings them to a place of being spiritual is actually deprivation and suffering. And one of the challenges for me, which made it more difficult, was that I was self-aware enough as a child that I couldn't

understand how people could be suffering and individuals not intervening. Or even how I could be in a situation where I was suffering or my family was suffering and there didn't seem to be a way out. Yet there were other people who seemed to have things going well for them, and to be connected, and to, if you — I use the term "successful." And that incongruity or paradox was painful for me.

MS. TIPPETT: And your father was an alcoholic, your mother was incapacitated and depressed, and sounds like you were often getting into fights, kicked out of school, often hungry. You slapped a nun once. I have to say that was a little shocking.

DR. DOTY: [laughs] Well, it's interesting, because I had transferred to this school, this Catholic school, because my father actually had gotten a job there, although it was very brief employment. But, as a result, it allowed me to go to the Catholic school. The problem was the Catholic school was multiple grades ahead of the school I had attended, and I was suddenly thrown into this difficult environment. And I did not know how to behave in that environment. And this particular nun assumed I had done something wrong, when in fact I had done nothing wrong, and just walked up to me and literally slapped me, which I'd never had that done to me before, at least in that context. And my reaction just as a person who has been in fights was to hit them back. And that was my last day in Catholic school.

MS. TIPPETT: [laughs] So it was a hard beginning, a hard backdrop, and then you do have this, dare I say, magical story of being introduced, also in that pivotal time of adolescence, to a new way to experience yourself, to calm yourself amidst that extreme chaos of your childhood. And even to begin to reimagine and shape your life. And it happened when you walked into — you kind of wandered into a magic shop.

DR. DOTY: Right. Yeah, I lived in the high desert — Lancaster, California. And I was beginning to go down the path of being a delinquent. I just fortuitously or serendipitously walked into a magic shop for the purpose of actually buying a new plastic thumb that I was using to do tricks with, and I meet this woman who I actually describe as this earth mother type. She's wearing a muumuu with this flowing grey hair, and she's somewhat overweight, and she has this radiant smile. And, amazingly, she has nothing to do with the magic store. She is simply the owner's mother, who happens to be sitting there while he's running an errand.

MS. TIPPETT: And she's visiting, right? She's just visiting for six weeks.

DR. DOTY: Exactly. Just there for the summer.

MS. TIPPETT: Yeah. There's so much that's so amazing about this story, but there's a passage that really struck me where she's — and I think maybe it was that very first day that you wandered in, and she said to you — or you were having a discussion with her about, why do magic tricks work? And there you were talking about the traditional magic tricks. And she said to you, "The brain, as busy as it can be, is actually very lazy." That this is why magic tricks work. "And, yes, magic works because people are so easily distracted. But," she said, "they're not distracted by hand gestures. Most people who are watching a magic show aren't really there watching the magic show. They are regretting something they did yesterday, or worrying about something that might happen tomorrow, so they're not really at the magic show to begin with. So how could they see the plastic thumb at all?" Which is such a fascinating diagnosis of Buddhist psychology and all these things we're learning to understand even better now through science.

DR. DOTY: Well, that's exactly right. There was a study that was done that showed that the average person almost 80 percent of the time, they're not focused on the present, they're focused on exactly that — regret about the past, or anxiety about the future. And when your attention is in those places, you can't give your full attention to even what's happening to you at that moment. And it limits what you can accomplish in that moment.

Unfortunately, it's a horrible distraction and it, again, limits us to the connections we are able to make, and actually even who we are. And it's the techniques that she taught me, and my own experience since then, have shown me the difference, because it's like, suddenly, you realize that you have been wearing glasses that have been fogged up. And you take them off and there's a vibrancy, the colors are different. The interaction is different. And that's what being present offers you.

MS. TIPPETT: And so, you have said — or you've written, "The brain is one of the most beautiful things I have ever seen, and to explore its mysteries and find ways to heal it is a privilege I have never taken for granted. We all have brains. But most of us have never seen them." Tell me about that. Tell me about the beauty of the brain that you are privileged to see.

DR. DOTY: Well, it is amazing, and, obviously, I do this job of being a neurosurgeon every day, but every time I'm in the position to, I hate to say, open a person's skull, it's extraordinary in the sense that this is where we live, this is us. And when you open the covering of the brain, the dura, and what you see is these hills and valleys, if you will, that are sort of pinkish, and you see blood vessels coursing over the surface. And there's a membrane that's sometimes cloudy, other places, clear, where fluid is, and it's pulsating. And that pulsating is matching the rhythm of your heart. And to think that within that is who each of us is, and that one event could occur and you're not how you were.

MS. TIPPETT: Yeah. You have also, in your years, your decades, in this field — in fact, one of the things that Ruth, your teacher in the magic shop, was teaching you is something we now call neuroplasticity. And yet, that word did not exist in 1968. And that is this simple and astonishing idea that our brains can change across the lifespan, and we can change our brains through our behavior. You must have watched that discovery and the naming of this with a sense of homecoming, I'm imagining.

DR. DOTY: No, that's exactly right, because as you point out, prior to that, we used to think that the brain and the neurons was all immutable, and nothing could be changed. And, really, the gift that Ruth gave me was my first experience with neuroplasticity. Fundamentally, in the six weeks that I interacted with her, what she taught me truly rewired my brain. And as I tell people, prior to that, I felt like a leaf being blown by an ill wind.

I had no control over anything, and events would happen, and I couldn't do anything about them. And I felt — and I think it was, in fact, reality — that at that point, when I met her, I had limited to no possibilities. And after that six-week period of time, I suddenly had this vision that anything and everything was possible, and, "What happened to me?" And that vision of possibility was so strong and so deep and so powerful that it was absolutely amazing. And the thing is, though, that my own personal circumstances fundamentally did not change at all. I went to the same ...

MS. TIPPETT: Right. At least for years, right?

DR. DOTY: Yeah. Exactly.

[music: "Dane Street" by Goldmund]

MS. TIPPETT: I'm Krista Tippett and this is On Being. Today, I'm with neurosurgeon James Doty, who also directs Stanford's Center for Compassion and Altruism Research and Education.

[music: "Dane Street" by Goldmund]

MS. TIPPETT: You say this interesting thing that — you say that "the brain doesn't distinguish between an experience that is intensely imagined and an experience that is real." And that "the brain will always choose what is familiar over what is unfamiliar," which becomes such an amazing way to think about the point of practicing, that you make another kind of presence, another kind of being in the world, familiar to your own body, to your own mind.

DR. DOTY: Exactly. In fact, when studies have been done, utilizing different types of measuring devices, such as functional magnetic resonance imaging, or EEG, we see that if you are thinking of doing an action, that part of your cortex starts being stimulated. And in fact, studies have shown that even if you think about working out, those muscles will actually start responding as if you're working out.

MS. TIPPETT: Oh, I kind of wish you hadn't told me that one.

DR. DOTY: [laughs] You're going to stop working out?

MS. TIPPETT: Just going to sit and think about it, yeah. [laughs] Sounds like a good shortcut.

DR. DOTY: [laughs] It's not quite as effective.

MS. TIPPETT: But that is amazing.

DR. DOTY: And this is — again, what people don't appreciate is really the power of their intention to change everything.

MS. TIPPETT: So, you point out that at the beginnings of science as we know it, in Egypt and Greece, the brain was viewed as pretty uninteresting. And it was the heart that was considered the seat of intelligence and consciousness. And one of the frontiers you work on now is how we are understanding the myriad ways the brain and the heart communicate, and, in fact, work back and forth on each other.

And, in fact, although for us, and for you, in particular, we are understanding the incredible mystery and majesty of the brain, we're also again — but in a very new way from ancient Egypt — understanding the heart as an organ of intelligence. That's very interesting for me to read about, but I'm not sure I'm saying it correctly.

DR. DOTY: No, I think you're saying it exactly correctly. I think that, in fact, poets have, for hundreds, if not thousands of years, talked about this connection. And, in fact, I tell a story about how Richie Davidson, who's also a neuroscientist ...

MS. TIPPETT: Yes, and he's been on the show, and he's the one who really — well, he's one of the people who helped name neuroplasticity by working — by studying meditating

monks.

DR. DOTY: Exactly. But in the process of that study — and he was actually trying to examine compassion — and he had them wear this EEG hat, or cranial cap, and he told these monks that he was going to be studying compassion, and they all started laughing at him.

And it was this understanding that deep emotions are expressed in the heart, and that there is this, if you will, mind-heart connection that's extraordinarily powerful. And we now know through anatomy and a variety of studies that there's immense amount of neural innovation that comes from the brain, the brain stem into the heart. And it's a two-way street, and they can have powerful effects on each other.

MS. TIPPETT: One of the pieces that you describe that you needed more life to learn was, in fact, the work of truly opening your heart. How does the scientist in you understand what's happening when you open your heart to — one place you said is, "When we go inward and our heart is open, we will connect with the heart, and the heart will compel us to go outward and connect with others."

DR. DOTY: As a species, we fundamentally evolved to care and nurture, initially, our nuclear family, but ultimately, our hunter-gatherer tribe, and that has imbued us with certain neural connections. And what I mean by that is that, to have what we call theory of mind, to have abstract thinking and complex language — which, really, are what, in many ways, define us as a species — it ultimately required that our offspring be cared for for a decade and a half, maybe even two, after gestation, unlike other species where the offspring just run off into the forest. And as a result, there had to be these very, very powerful pathways that bonded us with our offspring. So these neuropathways result in us feeling good when we connect, and making our physiology work better.

And, in fact, a number of studies have been done where people have been put in isolation or have been alone for periods of time, and their world completely falls apart. I give a talk about the difference between what I call "transformation," which oftentimes we get with just a mindfulness practice of attention and focus, but you cannot have "transcendence," which is this sense of meaning in your life, unless you take this journey outward, and this is a journey of connection to others. Because when you connect with others, and you have an open heart, and you embrace the other as you, your physiology works at its best.

MS. TIPPETT: So, we're living into that knowledge. We're learning, it seems, to claim that about ourselves. But we also work, as you've said, also in this conversation, with what you've called "the baggage from evolution," which is fight or flight, and the impulse towards tribalism. We see those dynamics at work in our workplaces, and geopolitically. This is this human struggle.

DR. DOTY: And we're seeing it playing out right now in the political arena. We're seeing it playing out in different parts of the world. And this is — my own belief is that it is an understanding of this reality that is ultimately going to define whether our species survives or not.

The problem is that, by the nature of the baggage that we were just talking about, we are oftentimes easily put into a position of being fearful, because when we're fearful, what happens? We have a tendency to shut down, we don't want to have new experiences, we want to have familiarity, which is typically being with people who look like us, act like us, who think like us. And when you shut everything down, it does give you a sense of being

safe, but it also keeps you chronically on pins and needles, wondering if you're going to be attacked.

And so, this is the danger of tribalism. And David Desteno, a neuroscientist, has done work in this area, where you can break down these artificial barriers of separation by looking at another person who may seem very different. Then you start seeing things with more clarity. And, really, what all of this is about, in some ways, and all of these techniques that Ruth taught me, and that a number of teachers have taught from a variety of traditions, is to see ourselves and the world with greater clarity.

[music: "A Dream Nuclei (feat. Kyrstyn Pixton)" by Auditory Canvas]

MS. TIPPETT: You can listen again and share this conversation with James Doty through our website, onbeing.org. I'm Krista Tippett. On Being continues in a moment.

[music: "A Dream Nuclei (feat. Kyrstyn Pixton)" by Auditory Canvas]

MS. TIPPETT: I'm Krista Tippett and this is On Being. Today, I'm with James Doty, who's a Stanford brain surgeon, and is also on the cutting edge of emerging research of how the brain and the heart talk to each other. What he's discovering may have the power to transform not just individual lives, but to reshape what he calls the "baggage of evolution" — the fight-or-flight response that is linked to violence and tribal conflict.

MS. TIPPETT: We mentioned Richie Davidson a minute ago, who's at Madison and has done some of these important studies. I'm pretty sure I heard him say [laughs] — but I wanted to check this out with you — that they're doing studies now practicing compassion and actually seeing the amygdala shrink.

DR. DOTY: Yes.

MS. TIPPETT: I mean, that's incredible. That should be on the front page of The New York Times, I think.

DR. DOTY: [laughs] No, absolutely.

MS. TIPPETT: Because the amygdala's the fight-or-flight place in our brains.

DR. DOTY: Yes. And we see other parts of our brain actually thicken in gray matter with some of these practices. So, it is really quite extraordinary. In some ways, I guess you could say this is analogous to strengthening certain muscles and allowing others to atrophy. And, again, it shows you — and this is what I tell people — is that, just like muscles, our mental muscle, if you will, responds to exercise. It's just which exercise you're going to do. And one exercise relates to mindfulness, compassion, lovingkindness, having an open heart. And when you strengthen that muscle, the world becomes a vibrant place where you recognize the incredible aspect of humanity that surrounds you in every person, how every person has this incredible potential to change the world.

Or you can do a form of exercise that makes you afraid, that makes you pull away, that makes you think that people are your enemies, or that people are out for something. And, unfortunately, sometimes it's an active choice, but for many people, they don't even understand that this is happening.

MS. TIPPETT: I'm very intrigued when I see you writing about your work as a surgeon

operating on people's brains. And I've spoken with people across the years, especially people who've had some kind of catastrophic accident, or disability, or really serious medical condition, who talk about the violence of medical treatment. That extreme medicine is violent. You rip people's skin from their skulls.

And yet, part of your — this thing you've learned about calming yourself is to stay very calm even when you might have somebody dying in front of you. So it's a very nuanced kind of compassion. But then, I was really touched by the story you told also of operating on a four-year-old boy, and how the hair has to be cut from his head, and, normally, that would be something that would just be part of the prep. But you do it yourself as a ritual. And you saved those cuttings for his mother.

DR. DOTY: Yes. For a child to have to go through the brutality of many of our medical practices, especially brain surgery, it almost seems as though it should never occur. And to treat that event or that process as almost something holy or spiritual, I think, honors that, if that makes any sense. And knowing how a mother or a parent is so terrified and afraid about what their child is about to undergo, to give them something that shows that it's not only just the surgery itself and doing an excellent job with that, but just shows the intention of what you're doing in the sense of taking the time to do this one thing that, on one hand, may seem fairly simple, but actually, in another way, shows that you are thinking about all aspects of this from beginning to end, and what it means to the parent and to the child.

MS. TIPPETT: So, you run the center at Stanford now, and one of your studies — I was just looking at the list of the research that you have going on. I was kind of — I wanted to ask you about this, the studying, the effects of meditation, I suppose — adepts versus novices. So, Richard Davidson started with what they called "Olympic meditators," who'd meditated 30,000 times or 50,000 hours, or 30,000 hours.

And, I guess, novices would be people like me, who might be called "dabblers." There were significant, not necessarily completely understood, yet, but significant effects, physiological effects, of that kind of sustained meditation. What's being learned about the more everyday kind of meditation that so many of us are trying to fit into modern lives?

DR. DOTY: Well, I think that's a good point. None of us, or very few of us, are really going to be able to do 30,000 hours, much less even 10,000 hours. But what we do know is that even short periods of time where you are attentive, if you will, or mindful, and have intention to open your heart, even that has a profound effect. And, in fact, even after brief periods of meditation, we actually can study the epigenetic effect of how our genes are changing the expression, even with brief periods of meditation, in the context of inflammation markers.

And it's extraordinary, because even with people who have meditated in this manner for as little as two weeks, you can see effects in regard to their blood pressure, in regard to the release of stress hormones, and effects on the immune system. And one of the big things that people don't appreciate is that a lot of disease is actually a manifestation of inflammation. And that is a manifestation of your immune system not functioning well, and these types of practices can decrease that inflammation.

And, again, when you do that, when you are able to decrease your stress hormones, if you will, down to their baseline level, it has a huge impact. So what happens is that your parasympathetic nervous system is engaged, or your vagus nerve, or this nerve to your heart, when it is...

MS. TIPPETT: That's how the heart and the...

DR. DOTY: ...when its tone is ...

MS. TIPPETT: ...brain communicate a lot, right?

DR. DOTY: Exactly. When you're able to increase your vagal tone through these types of practices, there's a huge, huge benefit in terms of your peripheral physiology and how your body works. And, again, even with practices as short as two weeks of even 15 to 20 minutes, we have found has had significant positive effect on individuals' lives. Not only from a physiology point of view, but even subjectively, where they indicate that it just changes how they look at the world, and how they respond to the world.

[music: "Life I" by Armand Amar]

MS. TIPPETT: I'm Krista Tippett and this is On Being. Today, with neurosurgeon James Doty, who also directs Stanford's Center for Compassion and Altruism Research and Education.

MS. TIPPETT: I also wanted to ask you about some work it looks like you're directly involved in on the convergence between heroism, compassion, and altruism. And that even including gang members. So, first of all, what are you talking about when you talk about heroism?

DR. DOTY: Well, this is actually a collaborative project with Phil Zimbardo, who, you may know, is an emeritus Stanford professor. But in the '70s, designed the Stanford prison experiment, which has ...

MS. TIPPETT: Oh, that's where I knew that name. That's it.

DR. DOTY: Yes, which is infamous, right? And at that time, he was studying ...

MS. TIPPETT: Say a little bit — just summarize that study for people.

DR. DOTY: Well, what happened was he created a study whereby students of Stanford were either put in the position of being a prisoner or a guard. And in a very, very short period of time, it had deteriorated so much that many of the prisoners became very, very submissive, and many of the guards became quite brutal. And they had to actually interrupt the experiment because of the profound negative effect that it was having on these individuals.

And what it showed was how context and circumstance can change this veneer that we perceive ourselves as being civil, and actually turn us into what we would hate to be thought of, which is a brutal human being, or somebody who has no power. And so this veneer that we have of sort of having it together and being strong can immediately also go away. So Phil did that work, and it's had a huge effect on — in fact, there's a recent documentary about that.

MS. TIPPETT: Yeah, and what's interesting about that in connection with what you're doing with him is that that's one of the studies where we say — we point at and say, "Look, this is what we're really like," right? Just take off the veneer and we're brutes.

DR. DOTY: Correct. But the other side of that, which is what we're exploring, is the reality also, though, that if you create the right circumstance, what we perceive as our highest ideals as humans suddenly blossoms. And this gets back to this open heartedness.

And the point is, in regard to the study we were alluding to with gang members, is it is a presumption that, given the right circumstance, most people will do the right thing. The majority of people. And that this concept of being a hero as being something that is available and should be embraced by all of us. Because being a hero doesn't necessarily mean that you have to jump off a bridge into freezing water to pull somebody out of the water. Being a hero can simply — recognizing a situation where somebody is at risk and just making the effort to go and just help them. And it could be even seeing an elderly person having difficulty crossing the street, or seeing a person perhaps being bullied, and just intervening. And the physiologic effects that individuals get, or what occurs in terms of making them feel good, or having the release of these hormones associated with reward, is actually quite amazing.

MS. TIPPETT: And so you've actually worked with gang members on creating a different context, a different set of circumstances that makes that more possible for them.

DR. DOTY: Exactly. When you give them instruction and training, and to show them a different world and how they do, in fact, have potential — you don't write them off as a gang member, regardless of how many tattoos they have, how threatening they superficially appear — when you give them the gift of recognizing their humanity, everything changes for so many.

And what's so sad is that you'll see these kids, they may be 18, 19. But when you talk to them, and you sit with them, and you listen to how much they've suffered, and you recognize in many ways they're still children, and they're just looking for that person who will embrace them and love them. It can be just really extraordinary.

MS. TIPPETT: Yeah it is. We've just got a few more minutes. So I was watching a panel, I think it was a CCARE conference that you did in 2014. It sounded so interesting. And it was final thoughts. And somebody on the panel, another scientist who's working in this world of research, said — she said she thinks a growth edge for the field is identifying the — that there's so much being learned about what we can do, in terms of fostering compassion, and human flourishing with a much richer imagination about what that looks like. But she said, we still need to keep identifying, what are the hard, thorny problems we still don't know how to approach in modern culture for many people? And I wonder how you think about that. What would be those issues, those dynamics for you?

DR. DOTY: Well, I think, actually, we've touched on some of them. One is our nature, if you will, to feel threat. And this tendency toward tribalism. And I think the other is how do you create sustainable change or habit change?

We talked earlier about one of the tendencies also to revert back to our base behavior when we feel threat. And it's interesting — when you pull all of this information together that we're learning about these different areas, and you can consolidate it, it gives you a much clearer picture — and, actually, I think, an optimistic picture — of the possibilities. There's a whole area of interest called neuro-hacking. [laughs]

MS. TIPPETT: [laughs] I haven't heard of that. Tell me.

DR. DOTY: Well, it's this belief that you can actually hack into your brain and change it.

And whether it's with drugs, or neuro-prosthetics, or a whole variety of technologies that you could take away or ameliorate some of these negative tendencies we have, and promote these other areas that are more positive. As an example, we talked about the amygdala and some of its negative effects. If you could create a drug, an implant, a stimulator that could ameliorate its effects and actually immediately respond when it feels a threat that's not a real threat, then that could change a whole set of interactions that we have.

MS. TIPPETT: I feel like we — it's hard — well, I don't know, maybe this is my lack of imagination. It's hard for me to imagine we can transcend the human condition with implants. But here's another thing that — I think it has run through our conversation, but I want to name it, and you've written this — it can hurt to go through life with your heart open. It's not just — we can decide to not be tribal. But you open yourself to more joy, and also to pain that you perhaps didn't let yourself feel before. And that's something that we're going to resist as creatures, I think.

DR. DOTY: Most of us have a tendency to desire pleasure rather than pain. What, though, I think anyone who has lived a life — which means you have had pain and suffering — is that you realize that there is a gift in the pain and suffering, because what it allows you to do is to see the reality that this is part of life. And it's part of a meaningful life.

And when you're able to take that pain and suffering and use it to not hide from the world, to use it not to be afraid of every interaction, but to use it to say, yes, it is hard sometimes, but I have learned so many lessons and have become more appreciative and have more gratitude, and see in so many examples how, in the face of the greatest adversity, people have shown their greatest humanity. And it's when you recognize this that that is when you're most proud of actually being part of the human species.

MS. TIPPETT: Tell me about studies that are happening now, or — this is such a wild frontier of neuroscience and understanding our bodies and brains, and the interaction between them. Tell me about some of the emerging edges of insight that are intriguing you at the moment.

DR. DOTY: Well, actually, it's interesting because one of the things — and we're actually editing something called the Handbook of Compassion Science which, actually, Oxford University Press will be publishing, but one of the concluding chapters that I'm co-authoring is actually the emerging field of artificial intelligence and the impact it's going to have. And what's extraordinary about this emerging field is the recognition — and isn't it strange — the recognition that you now have to bring in moral philosophers to interact with the computer scientists.

MS. TIPPETT: Yes. [laughs]

DR. DOTY: [laughs] Right?

MS. TIPPETT: Yeah.

DR. DOTY: Because you have to imbue these robots, if you will, with some degree of humanity. And also, in the human example, the same type of thing, where you have individuals who do not appear to have the capacity to connect with others.

MS. TIPPETT: Right. To bond deeply, like oxytocin.

DR. DOTY: Exactly. And so, on the forefront is the ability to potentially alter this in some manner where you can give people this gift of connection. Now, this heads off to a whole other area, right, because if you looked at the ...

MS. TIPPETT: [laughs] You might have spouses slipping that into their partners' drinks.

DR. DOTY: [laughs] Yeah, potentially. But it actually it brings up this whole point of, who are we really, right?

MS. TIPPETT: Yes. Yes, it does.

DR. DOTY: And then, is it right or is it wrong if we have the ability to change that ...

MS. TIPPETT: To reform them in that way, biologically.

DR. DOTY: Yes.

MS. TIPPETT: Wow.

DR. DOTY: Exactly.

MS. TIPPETT: That's amazing.

DR. DOTY: And, just as you say, is it right or wrong to change your spouse the way they want — you want them to be? [laughs]

MS. TIPPETT: Right. But it does raise the possibility that — let's say, in the next decades, in this century, we will be forced — because of where technology and science are taking us — to have to articulate a vision of human normalcy, and human flourishing. And I feel like you've answered this question in many ways in the course of this — of our conversation, but I wonder how this work that you do on a day-to-day basis, and what you learn, both personally, but also as a scientist — how does that continue to kind of infuse and shape the way you move through the world on an everyday basis? Do you see concrete ways that that continues to change you, or change you differently?

DR. DOTY: Well, I think there are a couple of things. I think one is that, at least, what I try to do, or what my intention or aspiration to do is, is to engage people in this open-hearted fashion. And in terms of my own practice with patients, as an example, one of the things that we see with physicians is that when they have a hopeless case, or a terminal case — and oftentimes, actually, neurosurgeons — once that reality is evident, they're gone.

And one of the things I found for myself is that the greatest learning and wisdom that I often have been privileged to be present with is actually the transition of a person, their death, and not being afraid of death. And I think the other aspect is to, at least for me, to appreciate that every day, I have the capacity to, through my actions, improve the life of at least one person. And what we forget sometimes is even smiling at another person, which takes very little effort, for that person who receives that, it can mean an immense amount. And not to forget that these small, little actions, these little ripples, can actually end up creating a tsunami if each of us engage in them. Remember, when a person — and we know this from the science — when a person sees another person engage in a positive behavior, they're many, many times more likely to engage in that behavior themselves. When they see another person act with kindness, and with generosity, and with gratitude...

MS. TIPPETT: It becomes infectious, right.

DR. DOTY: ...and when you ...

MS. TIPPETT: It becomes contagious.

DR. DOTY: Exactly.

MS. TIPPETT: A positive contagion.

DR. DOTY: Exactly. And of course, it can potentially become the opposite. But in the context of the positive, it can become contagious. And I don't know a single person, if they knew they had the capacity to create that contagion, would not want to do so. And I think having people understand — and this, I think, has been the theme of our entire conversation — that it's not the circumstance that's creating their emotional response. It is them. And oftentimes we forget that. In my own case as a child, this interaction with this woman Ruth did not change my life circumstance. It changed how I emotionally responded to that circumstance. And each of us has the ability to change how we emotionally respond to our life circumstance and create an environment where we ultimately can flourish and give those around us the opportunity to flourish.

MS. TIPPETT: Yeah. So this is my last question. Near the end of your book, you make a grand statement. You say, "We are at the beginning of an age of compassion." What does that sentence hold for you? What do you see? How do you see that manifesting? What are its components?

DR. DOTY: Well, sure. I think that — as you know, we had an age of enlightenment, which had a profound effect on our human species. And I believe that with the knowledge that we are gaining through neuroscience, through a variety of technologies, and we're seeing the effect, the positive effect, of compassion in little pockets in society and how profound it can be. And again, I believe that as we experience, as we see, as we manifest these little pockets of compassion and caring for the other occurring, it is ultimately going to be recognized that this is the path that will lead us out of darkness into light.

[music: "Making Amends" by Andy McNeill]

MS. TIPPETT: James Doty is a clinical professor of neurosurgery at Stanford University and founding director of CCARE, the Center for Compassion and Altruism Research and Education. His book is *Into the Magic Shop: A Neurosurgeon's Quest to Discover the Mysteries of the Brain and the Secrets of the Heart*.

[music: "Making Amends" by Andy McNeill]

MS. TIPPETT: At onbeing.org, you can sign up for a weekly email from us, a Letter from Loring Park. In your inbox every Saturday morning — a curated list of the best of what we are reading and publishing, including writings by our guest contributors. This week, we're continuing our conversation on the complexity of gun violence with Jackson Culpepper's essay, "The Thread of Violence: To Love and Learn from Guns." Find this and much more at onbeing.org.

[music: "Hopopono" by GoGo Penguin]

MS. TIPPETT: On Being is Trent Gilliss, Chris Heagle, Lily Percy, Mariah Helgeson, Maia Tarrell, Annie Parsons, Marie Sambilay, Tess Montgomery, Aseel Zahran, Bethanie Kloecker, and Selena Carlson.

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