

# What neuroscience tells us about spiritual experiences

What happens in the brain when you pray or meditate? Neurotheology explores the connection between our synapses and spiritual revelations.

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Spiritual experiences vary by faith, culture, and the individual.

"It was a warm pressure sensation at the base of my spine. It was really pleasant and peaceful. It was unlike anything I'd ever experienced," says *On Point* listener Fred Retes.

"One night as we headed over the Bay Bridge to San Francisco in the early evening, I felt sudden clarity and knowing that San Francisco was ... where I needed to be," says listener Deb McGuire.

Is science showing us that these experiences are more similar than we think?

"There's not one part of our brain that turns on when we become spiritual," says neuroscientist Dr. Andrew Newberg.

"In many ways, it's taking the existing aspects of how our brain functions and looks at the world, and these areas turn on and turn off in way they don't typically do, and they all are interacting in this very complex way."

Today *On Point*, spirituality and the brain.

## Guest

**Dr. Andrew Newberg**, Research Director of the Marcus Institute of Integrative Health and Professor at Thomas Jefferson University.

Author of "[The Varieties of Spiritual Experience: 21st Century Research and Perspectives](#)," among other books.

## Also Featured

**Fred Retes**, *On Point* listener

**Deb McGuire**, *On Point* listener

## Transcript

### Part I

MEGHNA CHAKRABARTI: Fred Retes and his sister were in the ICU, waiting at their mother's bedside. She was 84, suffering from chronic obstructive pulmonary disease, and in the last moments of her life.

*FRED RETES: We stood by her side in ICU for the long — you know, for hours. And you know, we wanted to be there — like everybody, I guess — at the moment, the person dies.*

CHAKRABARTI: Evening came. A doctor suggested they take a break. Their home was just over the hill from the hospital.

*RETES: And so we went home and, um, I was standing — my sister was lying in my mom's bed, and I was standing next to the white baby grand piano that my mom loved to play. She was all about music and musical instruments. And I never really liked that clock. But anyway, I looked at it and I noted that it was 6:41.*

*My mom's dog was sitting at my feet and I bent down to pet her just after I looked at the clock. And that's when I got this heavy pressure. It was a warm pressure sensation at the base of my spine that just moved gently up. It was really pleasant and peaceful. And it was unlike anything I'd ever experienced, ever. That's the best way I can describe it, the indescribable. And I knew it was Mom's spirit.*

*Just at that moment, the phone rang and my sister picked it up. It was the hospital saying my mom had just died at 6:41.*

CHAKRABARTI: Fred believes it was not a coincidence. As he said, to him, that warm, peaceful sensation was his mother making one last visit in spirit. It changed the way he thinks about death, especially now that he's in his seventies.

*RETES: I'm not worried about what happens after we die. My experience just gave me this sense of, "Oh, we're just spiritual beings having a human experience here, and she's moved on to somewhere else and we're all gonna move on."*

CHAKRABARTI: This is *On Point*. I'm Meghna Chakrabarti. Fred Retes grew up in a Catholic household, but doesn't identify with any religion himself.

And, of course, spiritual experiences vary between different beliefs, religions, cultures, and individuals. It may not always be triggered by a death. It could be a revelation or being struck senseless by beauty. It could feel like touching the divine, a commune with God. Or it could be what these *On Point* listeners have experienced:

*MARIA SABATH: I do a breathing exercise called kriya, and I describe it as a euphoric blending from oneness of the self to nothingness of everything.*

*JULIA HENGST: There have been shared experiences during shamanic groups that I've been part of where several people had a similar shared vision.*

*JOHN FISHER: Mine happened to be on a LSD trip many years ago. and we were wandering, looking for beautiful lights and things. We came*

*upon a giant building that was just magnificent with lights and timbers at Silver Falls State Park. And it turned out to be the bathrooms.*

CHAKRABARTI: *On Point* listeners John Fisher in Eugene, Oregon; Julia Hengst in Maui, Hawaii; and Maria Sabath from Southern California.

Well, in each case, whenever someone experiences a profound spiritual moment, clearly something is happening. Its subjective meaning, though, is up to the individual. However, objectively, there's also something happening in the brain. A wildfire of neural activity accompanies the spiritual experience.

And as researchers look more closely at what those patterns are, it raises a question: Across different spiritual and religious practices, are these experiences actually more similar than we think?

Well, Dr. Andrew Newberg is research director of the Marcus Institute of Integrative Health, and he's a professor at Thomas Jefferson University. He studies the relationship between brain function and various mental states, including religious and spiritual practices, and he's author of many books on the subject.

Dr. Andrew Newberg, welcome to *On Point*.

DR. ANDREW NEWBERG: Thank you. Thank you for having me on your program.

CHAKRABARTI: So you've been called one of the pioneers of neurotheology. Before we get into actually what some of your findings are, I was wondering if you would take me back to, well, I don't know, 10- or 11-year-old Andrew, and what it was about you, your family, your upbringing that maybe put you as a seeker on this path that you're on?

NEWBERG: Well, you know, I can't exactly say why I always had these questions. But going back to when I was a young kid, I just always was trying to understand the nature of reality. I didn't understand if we're all looking at the same universe, the same world around us, why we have different religions, different political ideas. You know, if we're all looking at the same world, why don't we just all have the same ideas about it?

And so, in my own mind, as I questioned all of these issues and sought out anyone who would listen. In fact, we're we're currently out in Colorado and I was just reflecting back on when I was at overnight camp and we would be sitting around the campfire talking about, you know, reality and God. And then, many years later, one of my friends said to me, "I can't believe that you took all of those discussions so seriously. That you really were trying to figure this out." *(LAUGHS)*

CHAKRABARTI: *(LAUGHS)*

NEWBERG: And I said, "No, I — this is really important to me." And, you know, I started by looking at the brain, as you mentioned in the introduction, something's gotta be going on in our brain. It's the part of ourselves that helps us to look at the world and try to interpret it and make sense about it.

But as I learned more and more about the brain — and I love studying the brain, it's been the cornerstone of my research throughout my whole career — I realized that there were other aspects of it. And, as you mentioned also in the introduction, about the subjective nature of these experiences, that there's something else that we need to look at as well, and whether we call that mind consciousness, the subjective experiences that people have, all those kind of philosophical — and even theological — questions and issues. That also became, I realized, very relevant in my approach to trying to understand what the nature of these experiences are like.

CHAKRABARTI: Uh-huh.

NEWBERG: And that's also part of what neurotheology is about. It's sort of bringing together the science of looking at what's going on in the brain and also understanding the nature of the spiritual, the religious and spiritual aspects, of all these different practices and experiences.

CHAKRABARTI: Were there any specific theological underpinnings to your family life growing up?

NEWBERG: Well, you know, interestingly, we weren't particularly religious. I was raised in a Reform Jewish household. We celebrated the basic holidays. But, you know, what I remember more than anything was that I would come in, often late at night, thinking about these things to my father. And I would say, you know, "What's the nature of God?" Or, "Why are there different religions?" And he would kind of always throw it back to me, say, "Well, tell me what you think. Why don't you figure it out?"

CHAKRABARTI: *(LAUGHS)*

NEWBERG: And so I was always very encouraged to ask questions. And I guess that's perhaps what allowed me to really pursue this whole field, which was not so much a very restrictive approach to religion and spirituality, but a very open one. And saying, you know, you have to figure — we all have to figure it out ultimately.

CHAKRABARTI: Yeah.

NEWBERG: And in my own mind, I mean, that was what propelled me to start thinking, "Okay, I've gotta figure this out now." And so I started to go down these different paths.



CHAKRABARTI: Well, I hope, if you don't mind me saying, but having your parents encourage you to ask questions — or asking questions of you in return — does seem like a very Jewish thing. So, um — *(LAUGHS)*

NEWBERG: *(LAUGHS)* Well, you know, we're always struggling with, with trying to understand what's going on and yes, absolutely. It seems to be the natural part of who we are.

CHAKRABARTI: Yeah, exactly. Of course, I wanna just make it clear again that we're — when we're talking about spirituality in the brain, this is by no means exclusively something that we're defining as a purely religious experience. right? The definition of spirituality is much broader than that. So I'm just wondering then, let's put some larger boundaries on it.

NEWBERG: Sure.

CHAKRABARTI: When you talk about spiritual experiences in your research, how do you define that?

NEWBERG: Well, that's a great question. In fact, a lot of my early work was really trying to look at definitions. In fact, I mean, one of the things that I love to do as, as my father would do to me, is to throw the questions back to people and say, you know, "How do you define these terms?"

Because when we actually go to think about what spirituality is, what religion is, and regardless of what group I may be talking to, I get so many different kinds of answers. Now, I think ultimately there are some general kind of universals that people talk about, and it has to do with forming a connection, a connection between ourselves and something greater than the self — and whether that's something greater is nature, is God, is some universal consciousness. People define that very broadly, whatever they consider to be sort of sacred. But there is that sort of, that longing for a search, that longing for a connection that I think frequently is part of the spiritual.

But what's also, I think, important — and this is something that I've learned by having conversations with thousands of people, by doing surveys, by doing brain scans, as I know we'll talk about a little later — is that there is such a great diversity of all of these different kinds of experiences, and yet at the same time, there are certain characteristics that almost all of these experiences also express. And even in the introduction where we were listening to some of those stories — and we can talk about them — there were certain aspects of those experiences that everybody was kind of bringing up in one way or another.

And so for me, I mean, it is fascinating that somebody has some kind of experience and

can say, "Ah, that is spiritual."

CHAKRABARTI: Mm.

NEWBERG: And they define that as distinct from our everyday reality kind of experiences.

CHAKRABARTI: Right.

NEWBERG: So there does seem to be something different about them, but exactly what part of that, has been a real cornerstone of what I have been looking at doing. Which is not just asking, you know, the great theologians and the great mystics of history or trying to get their stories, but trying to get everybody's story, the everyday person's story about what they consider to be spiritual.

CHAKRABARTI: Yes. Now, you do say though that regardless of how that experience manifests, that people seem to report five key things, right?

NEWBERG: Correct.

CHAKRABARTI: That sense of unity or connectedness that you talked about, clarity of the experience, intensity, surrender and transformation. So in all — or a feeling of transformation. So in, in all of your studies, these aspects come up frequently?

NEWBERG: Absolutely. And, you know, even in the stories that you presented at the beginning,

they were extraordinarily intense experiences. They changed the way they thought about life. They changed the way they thought about death. So yes, these are the kinds of elements of these experiences which we seem to find across everyone. And they're all connected to different things that are going on in the brain as well.

CHAKRABARTI: Mm. Well, today we're speaking with Dr. Andrew Newberg and he's one of the pioneers, as I said, of a field called neurotheology. And it seeks to understand what happens in the brain when we undergo spiritual experiences. So we will dive into that black box when we come back.

## Part II

CHAKRABARTI: Today, we're talking about spirituality and the brain and whether what's actually going on in our brains when we have profound spiritual experiences — regardless of what religion one might practice or what one set of beliefs one might have — whether that makes us more similar than we think.

And we're joined today by Dr. Andrew Newberg. He's research director of the Marcus Institute of Integrative Health and a professor at Thomas Jefferson University. Author of many books about neurology and spirituality, including "Neurotheology: How Science Can Enlighten Us About Spirituality." And his latest is "The

## Varieties of Spiritual Experience: 21st Century Research and Perspectives."

And I must say that listeners shared with us a great number of stories about their personal experiences. So here's another one. It's from Katie Green in Portland, Oregon.

*KATIE GREEN: Back in 2013, my friend Kyle passed away. and the following year on his birthday, I was at work. I'm a tattoo artist. And my client came in that day and wanted to get, "this too shall pass" tattooed on her. And it wasn't until we were finishing up that I thought, "Oh, it's Kyle's birthday," and "Oh, this too shall pass," was what his grandma always told him. And he told me that were he to get a tattoo, this is something he would wanna get. And he never had the chance.*

*And then, a few years later, it was, again, Kyle's birthday. And my client was gonna come in and get some other phrase tattooed on her, but she came in and said, "Hey, actually I wanna get 'this too shall pass' tattooed on me. And then this year, on his birthday, I wasn't at work. I was out running errands and I ran into a client and she said, "Oh, I wanna come back in and get tattooed soon. I've been thinking about getting 'this too shall pass' tattooed on me."*

*So this never happens on any other time other than his birthday, even though it's a common phrase. And so it's been, 10 years now since*

*he's passed and with the most recent one happening, it just, it makes me feel this sense of awe and how small I am within the fabric of our existence — that I don't quite understand everything that's going on, but that's okay also.*

*And it makes me smile. It makes me feel warm when these instances happen. And I love them and I love him and I miss him. So there's something wonderful about just knowing that he sees me and loves me and is still saying hello. Thank you.*

CHAKRABARTI: That's Katie Green, who listens to *On Point* from Portland, Oregon. Okay. So what is happening in the brain, Dr. Newberg, when people have these experiences that make them so commonly report what Katie just talked about — and other listeners did earlier — about this sense of connectedness and warmth, this warm feeling that people so frequently talk about?

NEWBERG: Right. And she's sharing a wonderful story. And you mentioned before the break that there are these kind of five general characteristics of the experiences. And those are the elements that people feel. So one of the things that is important for people to realize is that when we talk about spiritual experiences, because of their richness and the diversity that they have, they do affect us on many different levels.

In fact, there isn't just one part of the brain that turns on when we have this kind of an experience, but it can be our emotions — when you talk about a feeling of warmth, that can be emotional — but also, the brain and the body are intimately connected. So it's something that you can literally feel, that warmth, not just in your mind, in your brain, but in the body itself. So that also helps us to understand the visceral aspect of these kinds of experiences.

But the other aspect to all of these experiences that we seem to be able — when we did a survey where we got about 2,000 people who provided reports of the most intense experiences that they considered to be spiritual — we could break them down into different categories. And the kind of experience that we just heard probably falls into the realm of what are called synchronicity kind of experiences.

CHAKRABARTI: Mm.

NEWBERG: Where, there's these kind of things that keep happening that relate back to one another. They connect parts of the universe together. The person who had died with a certain quote, with a certain time. And when these things start to happen to us, we do start to recognize within our mind, within our brain — we don't know exactly how those experiences start to occur — but our brain begins to put them together and as the person also

suggested, that they realize that there's more to this universe than we are able to truly understand.

And even the cognitive parts of our brain, they struggle with trying to — how to deal with these kinds of experience. How do we understand them? And sometimes we try to come, some people try to come to a very scientific experience: "Oh, it's just a coincidence." And that may be --

CHAKRABARTI: Can I --

NEWBERG: But sometimes people feel that there's really a spiritual part, too. Go ahead.

CHAKRABARTI: Yeah. Can I just jump in here because I was just gonna gamely argue at a different point that, Katie's story, it really moved me. But I also wonder if prior to her friend passing away, maybe this phrase, "this too shall pass," was also very frequently encountered in her environment, in her day-to-day life, but her brain didn't actually sense it as an important pattern--

NEWBERG: Correct.

CHAKRABARTI: Until her friend passed away. And so after that, because the phrase then took on new meaning, her brain started detecting that phrase much more acutely when it came up in her environment, rather than it being,



something that mystically or spontaneously occurred after her friend died.

NEWBERG: Oh, absolutely. And again, it can be a little bit of a chicken and the egg, so to speak.

CHAKRABARTI: Yeah.

NEWBERG: Is it happening more because she recognizes it or is she recognizing it and that's why it's happening more? But part of what ultimately happens in the brain, when we start to think about these nets of structures and functions in the brain, you have the memory of something, the memory of an important person, a loved one.

You have a sort of cognitive concept, like this particular phrase. Then what happens is that now it starts getting matched with a very powerful emotional burst. So we're now talking about areas of the brain that help us with our emotions: the limbic system areas that people may have heard of like the amygdala, which turns on when something really important is happening in our environment.

So now, as you said, instead of it just being a phrase that I've just heard over and over again, it's now giving that little spark.

CHAKRABARTI: Mm.

NEWBERG: And then that gets back to those elements that we were talking about. It's not

just a concept, but there's an intensity to it. It feels more — much more strong to that individual. It makes them feel connected to something — connected to the loved one who died, connected to something going on in the universe. And it can transform them, it can make them feel differently about death, about life, about who they should be, about how they should connect to the people in their lives.

So we can see how this whole process starts to occur, whether that ultimately has a spiritual thing that truly ignites it, or whether it is purely neurological — that's part of the larger question that neurotheology has to answer.

CHAKRABARTI: Ah, okay. So that's your way of skirting around my next question. *(LAUGHS)* Which was gonna be: Is divine experience biologically predetermined?

NEWBERG: I think that when we look at the brains of individuals who are deeply religious versus those who are not, people have tried to figure out, is there something about a person who is religious, who looks at things differently, who understands things differently?

And it's really challenging to be able to make that kind of a determination because there's such a huge range of cognitive abilities, of emotional abilities, of ways in which we look at the world. It becomes very difficult to be able to say, "Okay, people who are religious, they tend

to see patterns in things more than people who are not religious." Although there's some studies, for example, that show that.

But what's interesting about even that kind of a concept: Does that mean that they're looking at the world incorrectly or just differently? And some studies have actually shown that when people who are religious look at the world in certain ways, they can sometimes see the world more accurately than those people who are not religious. And sometimes they make more mistakes than a person who is not religious. Because it depends on all the different ways in which we put the information that we have access to into our perception of reality.

And I think to me, one of the most important points that we all have to remember is that it's remarkable that our brain can even figure out the world at all.

CHAKRABARTI: Mm-hmm. *(LAUGHS)*

NEWBERG: We have access to .0000 — and throw in another a hundred zeros — 1% of the entire universe. All I know of what's going on in the universe right now is what's going on in this room where I am, talking to you on the radio. I don't know what's going on in the building next door, the town next door, the country next door, the galaxy next door. And yet somehow my brain is saying, "I've got this figured out. I understand how the world is."

So to me, it's not a surprise that people come up with a lot of different ways of looking at the world. Some are deeply religious and spiritual. Some are deeply non-religious and spiritual. And I don't know if they're right or wrong.

*(LAUGHS)*

CHAKRABARTI: Yeah. So I wanna actually just step away for a moment from any feeling that we need to interpret the right or wrongness, right, of any of these experiences, because it's actually your research into what's happening — as far as we can see — in the brain that I find most fascinating.

So let's — can you help us visualize some of the imaging that you've done over the many years of people in various states of religious practice? Because I see that you've done brain imaging on Catholic nuns praying, Buddhists meditating, people engaged in intense Islamic prayer, even Pentecostals speaking in tongues. Across these different practices, are the responses in the brain similar or different?

NEWBERG: I suppose not surprisingly, *(LAUGHS)* when we talk about the brain and its complexities, there are similarities and there are differences. And we do look at specific areas of the brain and how they are being turned on or off.

And that, to me, is a very important part of this, which is that there are complex patterns. And

what I mean by that is, for example, you mentioned the Catholic nuns. And so we did a small study of Catholic nuns doing a kind of prayer called centering prayer. And it's a deeply concentrative practice. They're concentrating on the prayer, on some phrase from the Bible. They meditate on it, they concentrate on it.

So when you concentrate on anything, you typically use a part of your brain called the frontal lobe, right behind your forehead. And so when we do a brain scan — when we put somebody into an MRI scanner, or we do something called a spec scanner, where we inject people with a little bit of a radioactive tracer that tells us how active a particular part of the brain is — we see an increase of activity in the frontal lobes.

And we see that in a lot of different practices that are concentrative. So if you're paying attention, if you're focusing on your breath, if you're focusing on an object, if you're praying to God, any of those things, you're always concentrating, you're always trying to focus your purposefulness on this practice and you increase the activity in the frontal lobe.

Now, you also mentioned a few other practices like speaking in tongues and the Islamic prayer study that we did. Those are both practices where one of the things that people were very clear about with me as I was learning about

what those practices were, is that they don't feel that they are purposely making it happen, but it is something that they prepare themselves for and it starts to happen to them. And so they feel that feeling of surrender that you mentioned earlier.

So that sense of surrender, that means that you're not concentrating. You're allowing your willfulness, your consciousness to go away. And when we scan their brains, the frontal lobes actually start to decrease in activity. When the frontal lobes turn on, you feel like you're in charge and you're doing something purposeful, and when it drops, you lose that purposefulness. So we can see these kind of different patterns that have to do with these different kinds of practices and the experiences that the person ultimately has.

Now, one other very important area that we've touched on is this notion of connectedness, oneness. And we think that this has a lot to do with an area in the back of the brain called the parietal lobe that normally helps us to create our sense of ourself. Our spatial representation of ourself and where ourself is in the world, and how we're connected or not connected to other things in the world. So when it turns on, we feel where we are.

But what happens when people lose that sense of self? Lose that — they have that sense of

oneness of all things, a sense of oneness of themselves with the world, with God? When that happens and we do a brain scan, the person actually has a decrease of activity in the parietal lobe.

CHAKRABARTI: Mm.

NEWBERG: And we think that makes a lot of sense. It turns on when we have a very clear sense of ourself. Then it turns off when we lose that sense of self.

So all of these different — there's a whole pattern of different areas of our brain that are involved. And as I said before, there isn't just one part of our brain that's involved in these spiritual experiences. It's the whole brain that gets involved. And then there's the emotions and the different feelings and the body feelings we have. So lots of different things can happen depending on what the person is doing and what they feel.

CHAKRABARTI: Dr. Newberg, I really do take your point about the complexity of the brain, but just to underscore, so I am not misinterpreting your research: I thought I also read that as you said, specific parts may show increased activity or decreased activity relative to a baseline. And that some of that also had to do with — when Catholic nuns were praying that they were often saying specific prayers, so that was a language-

based form of prayer that may have activated certain parts of the brain.

The Buddhist monks were visualizing during their meditative practice. That also maybe changed activity in another part of the brain. There's a different one I wanted to ask you quickly about: Brazilian mediums who channel messages from the dead through handwriting?

NEWBERG: That was an interesting study that we did, too. Yes. We had Brazilian mediums who came in and they did a practice that's referred to as psychography, where they get themselves into a trance state and they begin to write what they perceive the spirits to be telling them.

And, basically in line with what I was just talking about, they don't feel like they're writing, they feel like it's being written for them. So the language areas and the motor areas that are involved in this writing process, these are areas that actually quieted down. They shut down when the person was deep in this kind of trance state. And it makes sense in the context of what they felt, what they experienced, that it wasn't something that they were doing. That it was something that was actually happening to them. And that's consistent with what they reported.

And what was interesting also, was that when we actually began to analyze the writing — now, I didn't do this analysis, my colleague did, because it was in Portuguese — but he said that



the writing became actually more complex. There was more complex words that were used. And that in and of itself is interesting because how is it that somebody is writing something very complex when they're not using the language areas of their brain? So how does that exactly happen?

And again, it raises some fascinating questions about what's really going on. Is there some more rudimentary area of the brain that's able to take over and to write these things out for these individuals? Or are they really somehow connecting with something else out there that we don't, we can't pick up on a brain scan just yet?

And I think that, to me that's an important part of what neurotheology is about, which is being open to all the different perspectives until we're really sure. But for now we continue to just try to explore what these practices are like and how they affect people.

CHAKRABARTI: Yeah, so interesting. So again, as we head into the break, I just wanna keep track of all the parts of the brain we've talked about. Parietal lobe, decreased activity. You saw that in Tibetan Buddhist monks, and that's interesting because that has to do with a person's individual sense of time and place.

I heard you mention the amygdala regarding emotional response. Frontal lobe.

Hippocampus, that's the part of the brain that helps us with spatial memory and learning and that can be activated more profoundly during spiritual experiences. So indeed --

NEWBERG: Sure.

CHAKRABARTI: A complex system here but you're beginning — at the very beginnings of being able to maybe tease out a little bit about what's happening when people undergo profound spiritual experiences.

So we're gonna talk about, when we come back, Dr. Newberg, about how to take these observations and scientific lessons forward into how we live our own lives.

### **Part III**

CHAKRABARTI: Today, we're joined by Dr. Andrew Newberg. He's a pioneer in a field known as neurotheology. And you literature lovers out there are probably wanting to tell me yes, that term first emerged from Aldous Huxley's 1962 book "The Island." True. But now we're talking about neurotheology as a scientific practice.

And Dr. Newberg is author of many books on the subject, including "Why We Believe What We Believe: Uncovering Our Biological Need for Meaning, Spirituality, and Truth."

Another story here from an *On Point* listener, because we did receive so very many. This is Deb McGuire. And she told us that she had her first intense spiritual experience when she was nine years old and still a devout Christian. She had a moment where she felt truly intensely that God heard her prayers.

Later on, her faith had quieted, but she still had another life-altering spiritual experience. It was in 1977. Deb was 23 years old and a graduate student in Texas trying to figure out her future.

*DEB MCGUIRE: I didn't like graduate school. I was working as a TA and the work wasn't meaningful. and I had a Christmas break. And that's when I was just floundering about and went to visit a friend and she said, "Yeah, sure, come. But I was planning to go to California, so why don't you come with me to California?"*

CHAKRABARTI: Deb flew to Denver and there she and her friend drove to California. Deb still remembers the drive over the Bay Bridge as they entered San Francisco.

*MCGUIRE: It was on that ride into San Francisco. and we had the windows open. It was a lovely evening. It was in January, and it was warm. The air was moist. The lights of the city were so beautiful. And this experience just came over me, that this is my home. This is where I belong. This is where I need to be. I*

*just knew that was what was true for me and had to be.*

CHAKRABARTI: Eventually, it came time for Deb's friend to leave California. But Deb decided to stay another day because she was determined to find a job and a home and therefore be able to return to California.

*MCGUIRE: I just started walking. And stopped in the first bookstore that I saw — Stacey's Books, which is no longer there — but it was a really cool bookstore at that time. And I walked in the door and must have asked if they were hiring, and I spoke with a manager who interviewed me and hired me on the spot. It felt like just another part of that little miracle that was in process.*

CHAKRABARTI: Deb then looked for a place to live and being a student, she figured she would be able to find a community in Berkeley, a college town.

*MCGUIRE: I was standing there looking and a woman walked up to me and said, "Are you looking for a place to live?" And I said, "Yes." She said, "I live right near here and I've got a basement apartment. Do you wanna come take a look?" So I rode home with her and looked at her basement apartment. It was pretty cool because it had a view, if you really stretched, it had a view of the Bay Bridge.*

CHAKRABARTI: The Bay Bridge where she had that moment of clarity that she felt as if she belonged in California. And, just like that, Deb had found a home.

When she returned to Texas, she says she never bothered to even quit grad school formally and instead packed her bags and took a moving truck and returned to her new home in California. Now, more than 45 years later, Deb says that experience on the Bay Bridge changed her life at the time she didn't know what her future could look like.

*MCGUIRE: It was a low point. I didn't have many friends. I didn't like what I was doing, and I was just uncertain of what to do. I felt I was being drawn back in to just wanting to be all the time with my parents. And that experience provided me with a sense of direction and guidance.*

CHAKRABARTI: All right, so that's *On Point* listener Deb McGuire, sharing her experience from 1977. Now, Dr. Newberg, before we get into a discussion about what should we do with the knowledge that you're uncovering about spirituality and the brain, there's just a couple of other scientific things I wanna quickly go over with you.

One of them is: Everyone who responded to our call for their stories — our listeners did what we asked, if they'd ever had a spiritual experience.

So the stories were overwhelmingly ones of spontaneous spiritual experiences, as you've heard. Which is a different thing than people who are engaged in a spiritual practice that you've done the imaging studies on. So can we say that the things happening in the brain during a concentrated, self-generated spiritual practice are the same things that are happening in the brain during these spontaneous experiences?

NEWBERG: I think we can certainly extrapolate to that kind of a conclusion. The reason that we study practices like meditation and prayer is that we, it's just easier. Somebody can come in, we can say, "Okay, start your practice now," 45 minutes in, we know that they typically have an experience of unity or oneness. So there's a predictability to it, which certainly, from a scientific perspective, makes it a lot easier.

The spontaneous experiences — which are very important and a very important part of what I have been looking at — you can't do a brain scan on them because you never know when they're going to happen. But when we hear what people talk about — and this last story, wow, it just it includes so many of the elements that we've been talking about. That sense of connectedness, that sense of clarity, that sense of transformation, the intensity of the experience, all of these things are common across all of them.

And I think maybe even a more important point — that to me is a very important aspect of the neurotheology work that we do — is that, to me, it's a big puzzle that we have all these pieces to. So there are spontaneous experiences. And then there's near-death experiences — and a couple of people talked about things happening around death. There are these "dark night of the soul" experiences. She mentioned a little bit of that, that she was really in a very low point when the experience happened.

And there are times when people have them during practices like meditation and prayer. There's the effects of psychedelic experiences.

CHAKRABARTI: Mm.

NEWBERG: So all of these are — they all help us to get at what these experiences are in different ways. But there are, when you actually get the descriptions of them, you keep coming — I, at least, feel like — we keep coming back to these same basic components that make me think that there's probably a lot of similarities going on in the brain, even though they may originate from different reasons or different sources.

CHAKRABARTI: Mm-hmm. So the fact that we keep coming back to these same basic components, regardless of what name we want to ascribe to the experience — whether it be God, whether it be feeling at one with nature, whatnot. It makes me wonder if really what

we're experiencing is something even more fundamental.

And here I'm just gonna bow to the work of Dr. Anna Machin — I believe is how you pronounce her name? Or Machin? — from the U.K. who did scans of Carmelite nuns who were meditating on God. And she found that what they feel for God is akin to love, the love we have for our fellow humans. And so her conclusion is that when we talk about the inordinate impact of spiritual experiences, what we're really seeing in the brain is what she calls "the neural fingerprint of love."

NEWBERG: Mm.

CHAKRABARTI: What do you think about that?

NEWBERG: I think love is a very important part of a lot of these experiences. I would say though that, when we started to look at our group of about 2,000 experiences, that not all of them talked about it in that kind of term.

And I think a very important question that ultimately comes out from all of this is that when people say, "I felt love," "I felt a power," "I felt oneness," "I felt connectedness," "I felt an energy," "I felt a force." So we see all these different terms used. It's not always clear to me whether they all are the exact same experience that are just described in different ways because people think about them differently, or



if they are really fundamentally different kinds of experiences.

And my leaning is a little bit to the fact that there may be differences, but ultimately it's the intensity of those experiences — whether it winds up being love, whether it winds up being a sense of awe, a sense of fear sometimes is part of that, a sense of connectedness — but it's the intensity of those experiences. So I think that certainly love is a fundamental part of many of these experiences. I don't know if it's part of all of them.

And maybe one last little point to make in that regard is that while about 95% of these experiences are overwhelmingly positive, there is a percentage, a very small percentage, that are negative but still are considered to be spiritual. And so this is a whole other area for us to begin to look at, which is what happens when these experiences don't go quite so well and lead people to really struggle and anger, fear and so forth because of these experiences? So there's a lot for us to look at and to dissect as far as what all of these experiences are about.

CHAKRABARTI: Oh, sure. Otherwise we wouldn't even be talking about this. *(LAUGHS)*

NEWBERG: Absolutely. *(LAUGHS)*

CHAKRABARTI: Or you wouldn't be dedicating your life's work to it. But so I have to say, my soul is definitely inclined towards the sort of complex interpretation of experiences as being otherworldly or supernatural or beyond comprehensibility.

But as the rational part of my brain reads the research that's been done on this, I also find that there's some overlap between what happens when we have these spiritual experiences and what happens in the brain when people are having sex or doing drugs. Not to bring Karl Marx into this, but is this also just another version of the opiate of the masses and that's what we're seeing in these neural studies?

NEWBERG: Well, that's a great question. We've actually done some research where we've looked at, not just the areas of the brain that are turned on or turned off, but the neurotransmitters, which is what you're talking about. And actually, I used to quip that there was one study that showed that it actually isn't really the opiate system of the brain that's involved. So I think Marx probably was wrong. *(LAUGHS)*

CHAKRABARTI: *(LAUGHS)*

NEWBERG: But on the other hand there are other chemicals, natural chemicals like serotonin and dopamine, which are probably very involved in these experiences. We did a

study of people going through a spiritual retreat that showed that the brain became more sensitive to the effects of these neurotransmitters. And when I was talking a few moments ago about different ways in which people have these experience — the psychedelic drugs, for example, like psilocybin or LSD, they particularly very strongly affect, for example, the serotonin system.

And so is it possible that these kind of swirling neurotransmitters around in our brain really help us to have these kinds of experiences? And I think that's a very important way for us to begin to look at exactly what's going on.

CHAKRABARTI: Mm.

NEWBERG: But the last thing, to your point about what's the real nature of these experiences? The analogy that I frequently use is that I wear glasses and — I know the listeners can't see that — but I wear glasses. So when I wake up in the morning, it's a very blurry world. And I put my glasses on and I see the world clearly.

So who's to say that if somebody — if a shaman takes some kind of magic mushroom and has an experience, is that the same thing, like putting glasses on the brain, that they now just see the world differently, not necessarily artificially? And of course that's the big, \$100,000 question is what's really going on?

CHAKRABARTI: Yeah.

NEWBERG: But people need to understand that just because we can look at all the different things that are going on in the brain, it doesn't mean that we can necessarily explain them away. Maybe we can someday, but until we really are certain about that, we have to be open to the possibility that there are other explanations that still could all make sense in the context of how our brain is ultimately responding to whatever's going on around us.

CHAKRABARTI: Mm-hmm. So I heard you say earlier that one of the — outside the realm of pure research — that one of the important things that you would hope coming out of your work is that by understanding what's happening in the brain when we have these spiritual experiences, it should help us understand — or feel more sympathetic towards — people with different beliefs.

But on the other hand, you also said earlier that having those distinct beliefs or ways of seeing of the world, it's fundamental to aiding us in our survival which is why we cling onto the beliefs as tenaciously as we do. So those two things are in opposition. And I was wondering if you could very briefly tell us a story of something that you experienced in 2010 when you had been, you'd given a talk or something and you got two calls: one from a nun --

NEWBERG: *(LAUGHS)* Oh.

CHAKRABARTI: And one from an atheist.

NEWBERG: Right.

CHAKRABARTI: And they had essentially told you exactly the same thing. Go ahead.

NEWBERG: It speaks to the point that we were just discussing. So yes. That came about with our study of the Catholic nuns as we were talking about earlier. And when I did the brain scan of the nun and I showed her the scan she thanked me. She said, "Oh, this is terrific. It really helps to support the idea that when I do this prayer, it's not just something spiritual, but it's changing my biology. It's changing my brain. And it really reinforces my whole belief in God."

She said, "Thank you so much for doing this research." I said, "You're welcome." Off she went. I felt very good that I had made this nun so happy. A nice Jewish boy making a nun happy seemed to be a good thing.

CHAKRABARTI: *(LAUGHS)*

NEWBERG: And then, after we published the data I got a call and our assistant said, "There's the head of the local atheist society wants to talk to you." Okay. And I got on the phone and he said, "Dr. Newberg, I just wanted to thank you so much for doing this research and proving that religion and spirituality is nothing

more than just the manifestation of our brain's functions. And that there is no God and it's just neurobiology." And I said, "You're welcome." And off he went.

And I suppose there was some cosmic balance that the same information made a nun who's deeply religious and an atheist who's deeply non-religious both happy. But it speaks to the larger point, which is: How do we ultimately interpret this information?

And I think we have to be careful about that. And I try to be in my own work. I think it's fascinating to be able to learn what's going on in the brain and to see what's happening and to help us understand how we as human beings engage what arguably is one of the most important parts of humanity. Religion and spirituality has basically been there since the beginning of civilization and even before. So shouldn't we try to understand that?

But it also helps us to add to these big philosophical and theological questions because before, it was just arguments. And now we have some data to bring into the discussion — about what people experience and what's going on in the brain. So there's a lot for us to continue to explore. And that to me is what's so exciting about it.

CHAKRABARTI: Dr. Andrew Newberg. He's research director of the Marcus Institute for

Integrative Health and a professor at Thomas Jefferson University. One of the pioneers of neurotheology, as we've been talking about. Author of many books on the topic, the latest of which is "The Varieties of Spiritual Experience: 21st Century Research and Perspectives," and also of "Neurotheology: How Science Can Enlighten Us About Spirituality." Dr. Newberg, it's been such a pleasure speaking with you. Thank you so very much.

NEWBERG: Thanks for having me on the program.