

Neurotheology: Spirituality and the Brain

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Michael Egnor:

Today on Mind Matters News, this is Michael Egnor, I have the great privilege of interviewing Dr. Andrew Newberg, who is a pioneer in the field of neurotheology. That is a field in which he studies the theological correlates of activity in the brain. And so it's my privilege, and I'm very excited to interview Dr. Newberg today.

Andrew Newberg:

Thank you. Thanks for having me on your program.

Michael Egnor:

Thank you, Andy. I just want to give our audience, just a little summary of who you are. You are professor in the department of Integrative Medicine and Nutritional Sciences, and the Director of Research at the Marcus Institute of Integrative Health at Thomas Jefferson University Hospital in Philadelphia. And also, you have been an adjunct professor of Religious Studies and a lecturer on the Biological Basis of Behavior program at the University of Pennsylvania.

Michael Egnor:

You are a prolific researcher, a physician, and you have published 10 books and are really considered a pioneer and one of the world's experts on neurotheology. And just going forward, one of the book titles fascinates me, I'd like to talk to you more about that. The book title is Why We Believe What We Believe, which I think is of great interest to our audience and is of great interest to me. So, Andy, could you describe your research to us please?

Andrew Newberg:

Sure. Well, as you mentioned, a lot of the work that I have been doing has been in this field that has been ultimately called neurotheology. And to me, the simplest definition of that term is, more or less, as you said. That it's really the study of the relationship between our religious and spiritual selves and the human brain. There's a couple of important points that I'd like to mention about just what this field is all about.

Andrew Newberg:

First of all, for me, it is what I like to refer to as a two-way street. It is not just science looking at religion, it is not religion looking at science. But it is both of them really looking at each other to help us understand who we are as human beings. Recognizing that there's a biological part of ourselves, the brain and our body and so forth. There's a spiritual part of ourselves, which can be, more specifically religious, but can also incorporate other spiritual activities. And of course, there's also a psychological and a social part, which are ultimately all wrapped up in these different dimensions of who we are.

Andrew Newberg:

The other thing I always like to say about neurotheology is that if it's going to work, at least for me as a term, I'd like to define both sides of that very broadly, so that the neuro side is not just neuroscience or neuro imaging, but it can include psychology, it can include anthropology. It can include medical aspects, how different diseases and so forth are ... what happens when we develop different diseases and whether they may be associated with different religious and spiritual experiences. Or how people turn to religion and spirituality in times of health crises and so forth. So the neuro side, to me, needs to be defined very broadly.

Andrew Newberg:

And of course, theology itself is a very specific discipline, where we're talking about taking the primary tenets, the sacred texts of a given tradition, and trying to understand what they mean and how they relate to us as human beings. And we certainly can look at that from a brain related perspective. How does the brain think about these things? You mentioned the book, *Why We Believe What We Believe*, which has always, I felt, been a very important book that we put together. And looks at beliefs, different experiences, attitudes, behaviors, and so forth.

Andrew Newberg:

So again, for me, the theology side has to include all of these different aspects, including various practices like meditation and prayer, other types of spiritual practices and experiences. And also, really trying to look at this from a very global perspective. So we're looking at many different traditions. And we can certainly talk about this in a little bit more detail later, but we've done brain scan studies, for example, of lots of different practices from almost every different tradition.

Andrew Newberg:

And that, to me, is very exciting to be able to see the relationships and inner relationships and so forth that are very important for us in terms of understanding the overall impact of religious and spiritual beliefs and phenomena in our lives as human beings and how that has an effect on us. So a lot of the work that I have done, as I mentioned, has really been looking at using imaging studies. But there's other aspects that are really very important and I'm sure we'll get into them. But there's looking at different medical conditions, as I mentioned.

Andrew Newberg:

We've done some phenomenological studies looking at how people describe different kinds of experiences. So to me, it's an extraordinarily rich field of work, a very multidisciplinary field that gives us, I think a very exciting opportunity to find ways of bringing religion and science together, which I think is important. And again, I think to me, the ultimate ideal is helping us to understand who we are as human beings.

Michael Egnor:

In terms of brain scanning, what methods do you use to study the brain?

Andrew Newberg:

Well, we've been very fortunate to be able to use a whole array of different techniques. As one of my old mentors used to say, if you're going to be a good carpenter, it's good to have a lot of different tools in your basket. And I think to a certain extent, we've been very fortunate to be able to have a lot of

different imaging tools to be able to use. My background in the medical world is actually in nuclear medicine.

Andrew Newberg:

And so that does involve injecting different types of radioactive tracers to look at different physiological processes in the brain or in the body. And we have done that with two main types of imaging, one called SPECT, which is single-photon emission computer tomography, and PET, positron emission tomography. Pretty similar in terms of how they work, that we inject this radioactive tracer. Maybe it follows blood flow or metabolism or some aspect of the brain's function.

Andrew Newberg:

And we inject that, sometimes while people are engaged in a particular practice like meditation or prayer, sometimes a before and after. We did an interesting study of people going through a spiritual retreat program. And then we take a picture of the brain. We see where this material went. And it tells us something about the activity levels of the brain during different kinds of states. So we might look at somebody while they're in prayer and compare that to a meditation state, or compare that to a resting state or something like that.

Andrew Newberg:

And the other main imaging tool that I've been fortunate to use is functional magnetic resonance imaging, or fMRI, which basically uses a big magnet to be able to look at, again, different physiological processes like blood flow or neuronal activity. And there too, we have looked at different practices while people are meditating or just the effect of doing those meditation practices in terms of things like anxiety or depression and so forth. And sometimes that has more of a therapeutic bent to it.

Andrew Newberg:

But one of the interesting advantages ... or disadvantages of these techniques. With the MRI, you really have to be in the scanner while you're doing the practice. And sometimes that's very doable. People can do a prayer practice or certain meditation practices lying very still in the scanner itself. But other practices are much more difficult to do that. For example, we did a really fascinating study of people speaking in tongues, where they're making these different vocalizations and they're moving around and so forth.

Andrew Newberg:

So by injecting them with this little radioactive tracer while they're doing that practice, we can then scan them a period of time after they're done when they can lie still. But it captures a snapshot. It captures what their brain was doing at the moment that they were doing the practice. And again, then we can say, okay, well, this is what we see going on in the brain when they're speaking in tongues, when they are saying a prayer or whatever.

Andrew Newberg:

And so those have been the main tools. And other people have used things like electroencephalography, EEG, to look at electrical changes in the brain. So people are using a whole bunch of different arrays. And really, it's been a growing field of work to look at these practices from a variety of different vantage points using the technologies that we currently have.

Michael Egnor:

Of course, there's an enormous literature and body of knowledge on people's experience in various religious disciplines. How does this add to our understanding of spirituality? How does the use of functional MRI imaging, and SPECT imaging, and EEG, what does that contribute to our knowledge of religion beyond what we know from the great texts from theologians, all those things?

Andrew Newberg:

Sure. Well, and I think that is an incredibly important point. Which is that, to me, it provides a contribution. It provides an added perspective that perhaps we just haven't had the ability to look at before. But in no way, shape, or form does it eliminate or get rid of what those great theologians and what people through the millennia have had in terms of their experiences and the beliefs that they hold. So on one hand, if somebody is a deeply religious individual, that's what's important. And so in that context, being able to say that their parietal lobe did something or their frontal lobe did something doesn't really change what's going on in terms of their own beliefs.

Andrew Newberg:

It's sort of like saying, if we do a brain scan of somebody who ... we're trying to study love, for example. I mean, it doesn't mean that if we understand what areas of the brain are involved, that people should stop falling in love. It just gives us this new insight into a little bit about how it works and how these beliefs and these experiences have an effect on us. And in that context, I think there is some real value because it does provide some knowledge about how being a religious or spiritual individual or doing a spiritual practice may actually have an impact, not only on the spiritual part of who they are, but on the biological part and the psychological part as well.

Andrew Newberg:

And so, sometimes it's helpful for us to understand a little bit more about how these different affect us. Are they affecting different areas of our brain? One of the things that I think is fascinating is that even when you talk about prayer, for example, well, there's so many different types of prayer. And there's prayer that evokes powerful emotions, there's prayer that is deeply cognitive, there's prayer that is contemplative. And a valid question is, how are they related to each other? How similar, how different are they?

Andrew Newberg:

And again, there's certainly the theological explanation about their similarities and differences, but does that correlate with something that's different in our brain? Does it tell us something about how our brain intersects with those different practices? And does that in some regard, teach us a little bit ... If we think that a particular prayer practice evokes powerful emotions, are we seeing areas of the limbic system, the emotional centers of our brain, turning on? Does that correlate with us in terms of ... does it correlate with the findings and the descriptions that people have of those practices?

Andrew Newberg:

I think the other thing too, I mean, there's always a more practical aspect as well, which is certainly important for a lot of people. Which is, when people engage in various spiritual practices for spiritual purposes, for religious purposes, sometimes it helps them feel better. It helps them to cope. It helps to reduce their anxiety or their depression. And from a biomedical perspective, sometimes it's helpful to see, well, is that having an impact in the same way that psychotherapy may have an impact, or even a

medication may have an impact? Is it settling down our amygdala, our limbic system, so that people are less anxious? Is it turning on certain areas of our brain to help us feel less depressed, or bringing more dopamine into the brain to make us have a heightened mood?

Andrew Newberg:

So I think that there's that ability as well. And again, this does not lead us down a path of saying, well, if you have depression, we have a brain scan that shows that this prayer practice can help alleviate depression. You should do this prayer. But what I think it does help us understand is that when people do have depression, if they happen to find that particular prayer practice of value to them, maybe we understand a little bit more about how it's working, how is it helping them? And I think that that helps us to understand a little bit more, the overall relationship between our spirituality and our psychological selves.

Andrew Newberg:

And maybe the last way of answering your question, which to me is also quite fascinating, is the whole discussion of human consciousness. How do we actually think about ourselves? How do we become aware of ourselves, aware of the world around us? And of course, in some of these very profound spiritual states, mystical experiences and so forth, people are able to really alter their levels of consciousness. And trying to understand that, I think may provide us an opportunity to be able to say something about the nature of human consciousness as well.

Andrew Newberg:

So I think in many ways, the answer to your question is that it cuts across some very, what might be called esoteric ideas, just about what prayer is and what these spiritual beliefs and experiences are. And teaches something about how they operate within us. To things about how the brain works, how the mind works, how consciousness works. To the more pragmatic, even therapeutic kind of concepts about, well, if you do a prayer practice, is this changing your brain in a way that may help you with depression or may protect you against Alzheimer's disease or something like that?

Andrew Newberg:

And so I think there's a lot of very interesting and very exciting ways of taking it, depending on what a particular person is interested in exploring.

Michael Egnor:

Certainly, from what I know of your work, I'm very impressed. I think it's a fascinating topic. And I think you're doing wonderful work. There is a critique of neuroscience, particularly cognitive neuroscience, that has been given by Roger Scruton, who was a philosopher. I think he passed away recently. And he described neuroscience in an extraordinarily succinct, but I think accurate way when he said that, "Neuroscience is a vast collection of answers with no memory of the questions."

Michael Egnor:

And what I like and what I've read of your work and what you're describing is that you are pretty serious about the questions, because one can get so lost the methodology and data produced by neuroscience, that you really forget the questions that we're trying to answer. Do you either have, or have you acquired any particular metaphysical perspective on the relationship between the mind and the brain?

Is your work showing you a materialist perspective, an idealist perspective, a dualist perspective? Has that entered into your work?

Andrew Newberg:

Well, thank you. I mean, those are all wonderful points and extraordinarily challenging questions to answer.

Michael Egnor:

Yes. Have you solved mind, body problems [crosstalk 00:15:53]?

Andrew Newberg:

Right. I figured it out last week. Well, going back to your point about the critique, first of all, I mean, I think it's really right on the mark. I mean, so much ... in fact, part of why, to me, neurotheology has a value is that it's not just about the science. But it is out the philosophical issues and the theological questions that we ultimately are really trying to answer. I mean, in my mind. A lot of times people ask me how I got interested in this. And in many ways it was really a philosophical pursuit to understand the nature of reality and how we as human beings understand that reality.

Andrew Newberg:

And so, so much of what I think we need to learn in this context is, what are the questions, and how do people process the answer to the questions? How do we go through our own thought processes? How do we engage them in different kinds of ways? And in fact, one of the things that we've started to get more into actually, has been to actually ask people those questions. And that, to me, is also actually fundamentally important. That it's not just the great theologians who have cornered the market on answering these questions, but what does everybody think? What do other people think about God's existence, and how do they come to those ideas? And what does God mean? And how do they understand what God is, for example?

Andrew Newberg:

So I think that part of what we want to do is explore the nature of those questions. And then see where, when we can bring some scientific information into the discussion, does it help us? Does it give us a new insight? Does it not really help all? And I would say, to answer your bigger question, when it comes to those metaphysical questions, I think that from my own personal perspective ... one, I think we have to be extremely careful about how we interpret results of any scientific study. And so I think it's always important to be open to the materialist perspective, open to the supernatural perspective, and open to ways of perhaps trying to find an integrated approach that finds ways of linking them together, whatever that means.

Andrew Newberg:

And so in my own heart of hearts, a lot of what I do is actually very contemplative. I spend a lot of time thinking about those questions and how the different pieces of information that I have been able to look at in terms of brain scans and so forth, what does that actually mean, and how do we understand it? And I guess ... I'm not sure if this is another answer to your question. But if my fundamental question is, how do we know what's real and if what we perceive to be real is accurate? Part of what I've always thought about is that in some sense, you have to get outside of your brain, whatever that means. Look

at the world, and then see if the way the world is out there is consistent with what you're thinking on the inside.

Andrew Newberg:

Now from a cognitive neuroscience perspective, there's no way to do that. But from a philosophical or theological perspective, a spiritual perspective, we have these experiences, certainly the more intense spiritual experiences or mystical experiences, where people describe that kind of state. Where they say that they have gotten beyond their brain, that they have gotten beyond their consciousness. They've become one with God, they've become one with the universe. And I can't say that those are absolutely true either. But, boy, they're incredibly fascinating experiences that I think really require a lot of effort to explore and understand. And understand them both from the perspective of the experiences themselves, as well as from the perspective of, well, how does that still connect to whatever's going on in a physical world and in their brain.

Andrew Newberg:

So I certainly don't have the answers yet, although I have always said that if I ever figure it out, I will certainly let everyone know.

Michael Egnor:

As soon as possible, yes.

Andrew Newberg:

As soon as possible. But I do think we have to be really careful. And if you'll indulge me for a second, I mean, one of my favorite little stories is about the study that we did of a group of Franciscan nuns. And it was a very small study. And the nun had come in ... one of the nuns had come in and we did her brain scans. And I showed her what was going on in her brain when she was doing a kind of prayer called centering prayer, versus when she was just at rest. And after I showed her all the changes that went on in her brain, she thanked me so much. She thought it was so wonderful to be able to see. She said, "Thank you, Dr. Newberg, for showing me how the prayer practice really validates my ability to connect with God and how it has an impact on me and my brain and my body." And she was really just so appreciative. And I said, "You're welcome." And off she went and I felt very good that I had helped to make this nun happy.

Andrew Newberg:

And then after we published our study, I had a call from the head of the Local Atheist Society. And I said, somewhat sheepishly, "Hello." And, "How are you doing?" And they said, "I just wanted to thank you so much for doing this study and proving that God is nothing more than a manifestation of your brain's function. And that religions are just ... we can just reduce all religion to the brain." And I said, "Well, you're welcome." And off he went and he was happy. And somewhere in the yin yang of the universe, there was ... I thought it's amazing that one study can make a nun and an atheist happy at the same time.

Andrew Newberg:

But it underlies the point, I think, which is that the beliefs and the biases ... and we talk about this in the *Why We Believe* book. The beliefs that we hold going into whatever pieces of information we look at, affect greatly how we interpret them. And so I always say, well, all the brain scan is showing ultimately,

is what's going on in her brain when she has that experience. It doesn't prove that God is, or is not in the room with her. It's just showing you what's happening in her brain. But from that information, how far can we go? And what can we say about these experiences and their effects?

Andrew Newberg:

And so I still think that, while we may not necessarily be able to truly answer the metaphysical questions ... certainly, we're not going to do that just by doing a brain scan. Maybe by bringing all of these different elements together, we might get a little bit closer than we ever have before. But I don't know.

Michael Egnor:

Well, thank you. And let's continue this in our next segment. But I'm very grateful to Dr. Newberg for this fascinating discussion and we will be continuing shortly. Thank you very much.

Announcer:

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