

## Body, Mind, Spirit CD - This is Your Brain Praying – Home Study in Vibrational Healing with Dr. Robert March, BS, ND

By Louise Danielle Palmer



When Andrew Newberg's book on the brain science behind religious and mystical experience turned up on the cover of Newsweek, it sparked a lively debate about God, evolution, and the meaning of life. This "neurotheologist's" work is moving fast, so we caught up on his personal quest to understand the mysterious workings of mind and spirit, his latest research, and its profound implications for our daily lives.

When Andrew Newberg, M.D., was a little kid, he had questions so pressing that they would wake him in the middle of the night, get him out of bed, and lead him into his father's den. How do we know God exists? he would ask. Why is there good and evil? How do I know what's real?

"It's embarrassing to admit, but I was five years old when I started asking these questions," says Newberg, co-author of the acclaimed book *Why God Won't Go Away*. Not the musings of an average youngster. Then again, there is nothing average about Newberg, who at 36 is a professor of nuclear medicine at the University of Pennsylvania Medical Center, a radiologist at the university hospital, and the leading light in the field of neurotheology, the brain science behind spiritual and religious experience.

Newberg's exploration of neurotheology is based on a decade of intellectual partnership with Eugene D'Aquili, M.D., a psychiatrist at the University of Pennsylvania with a doctorate in anthropology, whom Newberg describes as "the most brilliant man I've ever met." D'Aquili, who died three years ago, was also a scholar of religion and medieval history who spoke five languages and had every bit of the obsession to get to the root of reality as does Newberg. They were a perfect match: Newberg had the brain science background and a spiritual and philosophical bent, whereas D'Aquili, an Italian Catholic, had a wealth of insight into psychology, history, and theology. Within the first year of their collaboration, they had developed a theoretical model for something never before illustrated: the spiritual circuitry of the brain.

By building a bridge between science and spirituality, Newberg believes we can achieve what many doctors, physicists, and theologians consider impossible: to pinpoint the origin of consciousness. Newberg insists that if we elevate our understanding of mind, body, and spirit, we will one day penetrate the mystery of the source of life itself. When that happens, he says, we will discover the true nature of reality, rather than our subjective experience of it, which we cannot verify.

"Just because it hasn't been done doesn't mean that it can't be done," he says with a laugh. "Somebody has to do it." Given his search for answers to the big questions, his spiritual bent, and his mastery of high-tech medical wizardry, Andrew Newberg may well be that somebody.

"Andy's work is really cutting-edge," says David J. Hufford, Ph.D., director of the Doctors Kienle Center for Humanistic Medicine and interim chair of medical humanities at Pennsylvania State University.

“It’s one thing to get respect as a technical first-class performer in radiology, but combining that with a breadth of understanding and openness — that’s where you go from being a first-class technical researcher to being in a league of your own. That’s where Andy is — in a league of his own.”

Newberg is thin, intense, and a fast walker. I try to keep up as he races down the corridor of the hospital’s nuclear medicine wing, talking excitedly about the SPECT machine, short for single photon emission computed tomography. He leads me into a dimly lit beige room housing an enormous humming contraption that looks fit for space travel. The SPECT has a metal plate upon which the subject’s head is placed, surrounded by a three-pronged camera that generates 3-D pictures of the brain. This is the machine that allowed Newberg and D’Aquili to test their theoretical model and capture the now-famous snapshot of the brain in the moment of spiritual transcendence, a state variously known in its highest form as *samadhi*, *nirvana*, God consciousness, or absolute unitary being, a term they coined.

Newberg and D’Aquili began their study with a group of devout practitioners of Tibetan Buddhist meditation. Each man was taken into a room, wired with an IV, and given a length of twine to pull once he reached a peak meditative state. Each sat before a single flickering candle, inhaling the gentle aroma of jasmine incense, quieting his mind as he journeyed inward. Newberg waited next door for a tug on the twine. When he felt the tug, Newberg entered the room, injected the man with a radioactive liquid that travels through the bloodstream into the brain, and whisked him into the SPECT room for a scan.

The images he captured showed that the brain’s prefrontal cortex, called the seat of attention, lit up in a brilliant vermilion, indicating an increase in blood flow, or neural activity, due to the meditator’s state of deep concentration. However, the upper rear area of the brain, known as the orientation association area, had gone dark, turning a deep shade of blue. This is where we get our ability to orient ourselves in space and time, which gives our bodies a sense of physical limits. It is also where the brain “makes” our sense of an individual “self” existing in — and apart from — the physical universe.

The darkness in this area told Newberg that when a meditator took a metaphorical dive inside, the outside world receded, effectively blocking the sensory input that ordinarily streams into our brains. With no information flowing into that area, the brain cannot create a boundary between self and outside world, or locate itself in physical reality. As a result, Newberg explains, it has no choice but to perceive that self as endless, interwoven with everyone and everything. This perception is utterly real to the subject, as real as apple pie (more on that later).

“I experience ... the emptiness of conditioned existence,” explained one of the Buddhists in the study. “Sometimes I have a feeling of energy centered in my heart. At the same time, I visualize this energy going out into infinite space.”

The chromatic changes on the scans were key to understanding the euphoric, otherworldly states described by so many mystics across time, geography, and culture. Christian monks, Jewish Kabbalists, Himalayan yogis, Sufi whirling dervishes, and Buddhist meditators all speak of an altered state where the self is absorbed into some larger force or being, described as the spiritual All or the mystical Nothing, depending on one’s perspective.

Newberg later replicated his findings with a study of Franciscan nuns who were scanned during moments of profound contemplative prayer. The brain activity, or lack thereof, was remarkably similar to the monks', although the nuns' brains showed increased activity in the region that creates language. And whereas the Buddhists described their transcendent moment of meditation as contact with the universal consciousness where the self no longer exists, the sisters tended to describe this moment of prayer as a merging with a tangible God, "a greater connectedness with all of creation ... a sense of union with a Presence." Both describe a place of boundless peace, unity, infinity.

The results also revealed something remarkable: The thalamus in both Buddhists and Franciscans was asymmetrical, suggesting that the brain structure of serious spiritual practitioners differs from most people. Whether their brains are different as a result of sustained spiritual practice, or whether they were attracted to the practice because their brains were different to begin with, is still an open question.

Newberg began his research hoping the scans would illuminate the mysterious connection between "human consciousness and the persistent and peculiarly human longing to connect with something larger than ourselves."

What he learned was that this longing is grounded in our biology and manifested in the very wiring of the brain. Whatever sceptics say, mystical religious states can no longer be written off as the result of wishful thinking or emotional confusion. Newberg's scans have rendered them visible and observable. "When you show someone a scan and they see changes in the brain, they are seeing something happening they can't argue with," Newberg says. For centuries, shamans, mystics, and monks have been variously labeled as neurotic, deluded, epileptic, and even insane.

"Andy brings a fresh way of looking at spiritual experiences that doesn't make pathological assumptions about them, but rather sees them as adaptive and valuable," says Hufford. "He is correcting a fundamentally wrong approach toward what it means to be human. It is in the medical disciplines which have a great deal of prestige as the scientific gold standard where you are now finding the most productive research on spirituality. Seminaries around the world are trying to catch up with what Andy's doing. It's amazing to see this work happening in the belly of the beast."

Although spirituality is finding a footing in the Western medical world, sceptics continue to cast doubt on Newberg's work, saying it proves that a spiritual state is nothing more than a neurological event. They claim that spirituality is conjured by the mind and has no basis in reality, citing studies of people with brain disorders who commonly experience religious or spiritual revelations, as well as experiments in which electrical storms stimulated in certain parts of the brain gave rise to religious or spiritual visions.

"I put on glasses to see better," says Newberg, who does, in fact, wear lenses, "so if God is an infinite and highly energetic being, then maybe when you have a seizure, your brain is amplifying your vision in a way that allows you to see God. Because a person uses a drug or has a brain abnormality that allows their mind to be more open to spiritual experiences doesn't make that experience any less real. A shift has taken place."

Newberg likes to refer sceptics to the apple pie analogy. If you ate a freshly baked, piping-hot slice of apple pie and took a SPECT scan at the moment of your first bite, the parts of your brain that register shape and form, smell, taste, memory, and association would all light up, while other areas of the brain not involved in the task would go dark. This experience leaves its footprint on the brain in much the same way as does a peak meditative moment. But does that mean the apple pie isn't "real"?

Of course, Newberg's research circles back to the question he asked as a five-year-old: How do I know what's real? If reality is entirely constructed by our brains, how can Newberg find an answer to his question? Does that answer lie in an ultimate reality beyond this one that transcends — and gives birth to — our subjective experience of our world? Are the brain scans giving us a glimpse of that place Newberg calls **Absolute Unitary Being** (AUB) that mystics have long claimed is far more real than our daily "reality"?

"Informed speculation tells us that AUB is a primary reality from which all objective and subjective perspectives are derived," Newberg writes in *Why God Won't Go Away*. "Whether or not it is real, it provides us with a common source of all spiritual urges and a universal goal that has been interpreted in myriad ways by all the great religions of the past and present."

Spiritual seekers are in good company. Some of the best scientific minds of the twentieth century — Albert Einstein, Robert Oppenheimer (the theoretical physicist who helped create the atom bomb), and Edwin Schrödinger (the physicist who helped create quantum theory) — believed the universe had unity and purpose that went beyond the material world. They maintained the possibility of a deeper self beyond what we think of as the self — a part of us that sees beyond the duality of subject (me) and object (everything else). Einstein, for instance, spoke of a "cosmic religious feeling" during which one feels the "nothingness of human desires," only "the desire to experience the universe as a single significant whole." Schrödinger wrote that "you — and all other conscious beings as such — are all in all."

With continued research in quantum physics, spirituality, and neurotheology, Newberg hopes that the mystical state, or AUB, could become the spiritual foundation for a "megatheology." For now, though, the question of whether this reality actually exists is beyond the reach of Newberg's SPECT machine — and beyond science itself. The only answer is the one rooted in your own experience.

"It comes down to how we feel and sense reality in the moment, so I view these brain scans as leveling the field," says Newberg, munching a butterscotch Tastycake Krimpet. "What we are saying is that, from a neurological perspective, hearing God is as real as eating an apple pie, and eating an apple pie is as real as talking to the spirit of a mountain or walking down the street. Something is happening in the brain so it is quote unquote 'real.' Whether or not it corresponds to true external reality, my brain scans can't tell you. What they prove is ... you can't prove it."

### **Does Newberg believe in God?**

"I'm trying to figure it out," he says hesitantly. "It's a hard question to answer, being in my position. If I say yes or no, people will say I'm trying to prove or disprove the existence of God."

I hate to sound so middle-of-the-roadish, but I'm open to both."

At the very least, Newberg says he is certain that humans have evolved the capacity to perceive an absolute, universal reality in which we are all fundamentally connected as one, and this in and of itself requires us to reconsider our basic assumptions.

"It puts our everyday reality in a different light, especially if you believe that our human consciousness or pure awareness is the fundamental stuff of the universe, and that consciousness is abounding everywhere rather than residing in the brain itself," he explains. "Our brains are very good at bringing consciousness in and coalescing it into a person, but the brain is not responsible for consciousness per se. It is just the vehicle by which consciousness can be manifested. Consciousness can't just be a phenomenon of the brain because there is no reason that the more neurons and connections you pile on, something that says, 'Oh, I'm me' is created. On the other hand, we can't yet explain how our physical world came out of consciousness."

Newberg points out that either a strictly spiritual or strictly scientific approach limits our understanding. We can't get out of our brains to know what is actually out there because we are trapped in our own consciousness. We create the questions — and the answers. We create science. Even if you go into meditation and you transcend your mind, which offers you the opportunity to do what science can't, the problem of being outside your brain still exists. How do you return so that you can report back?

Newberg chuckles at this question, leaving it hanging in the cool air as he pops the last of his butterscotch Krimpit into his mouth and wipes the crumbs off his face.

### **What does this mean for our daily lives?**

If we have evolved with the potential for the mystical, can anyone transcend the mind and reach infinity and unity? Perhaps not. Some of us are barely able to balance our checkbooks, while others can do calculus in the ninth grade. In the same way, Newberg believes some people are born with a greater capacity for spiritual expansion than others.

On the other hand, Newberg says, a person may not have not found the appropriate technique — prayer, meditation, creative expression — to transport him or her to that place. Newberg's current research is focused on designing experiments to track the effect of a variety of techniques on the brain in order to help people discover what best suits their nature.

What is important, he says, is that all human beings have the longing — and the capacity — for connection and that connection is available everywhere: in church, in music, in art. In fact, many of the religious rituals we engage in, such as chanting, drumming, dancing, or moving in a rhythmic fashion, mimic the complex response of our brains to mystical experiences.

For example, when we focus on one source of sensory input — whether it is the sound of a drum or the image of a cross — we deprive the brain of other kinds of information. This helps shut down the orientation association area, which gives us our sense of where we begin and the world ends, just as it did when the Franciscans and the Buddhists entered a deep meditative state. In other words, focus and contemplation make us more likely to feel "one with everything." They also intensify our nervous system's "quiescent" state, which is linked to spiritual feelings.

In fact, the autonomic nervous system, which is connected to higher brain structures and regulates basic functions such as heart rate and blood pressure as well as emotions, is key to understanding why spiritual and religious activities affect us. The autonomic nervous system is made up of the sympathetic system, which prepares the body for action and activates our flight-or-flight response when we are in danger by increasing heart rate and muscle tone, and the parasympathetic system, which is responsible for keeping the body in balance by regulating sleep, inducing relaxation, and governing cell growth. Many ritualistic practices — from tantric yoga to meditation — are associated with changes in the heart rate, blood pressure and breathing, all of which are controlled by these systems.

Usually, increased activity in one system results in decreased activity of the other. Newberg and D'Aquili, however, discovered that when both sympathetic and parasympathetic systems are pushed to extraordinary levels by intense physical or mental activity such as prolonged concentration or repetitive motion, altered states of consciousness are triggered. Maximum stimulation of both systems results in "an ecstatic rush of orgasmic-like energy," sensations of oceanic tranquillity and bliss, total absorption, and extraordinary relaxation — all at the same time. These descriptions mirror high mystical experiences, as well as milder versions of them, across spiritual and religious traditions.

Given how good spiritual and religious practices make us feel — and the growing body of medical evidence showing that they cut down on stress, improve the immune system, lower blood pressure, and actually add years to our lives — it is no coincidence that we have evolved to be hard-wired for God, so to speak. What is surprising, however, is that this wiring is rooted in our sexuality.

Newberg believes it is no coincidence that the same feelings associated with mystical experience — transcendence, a feeling of union, ecstatic bliss — are also associated with sex. When Newberg and D'Aquili mapped the biology of mystical experience, they found that the autonomic nervous system has a particular pattern of arousal and quiescence. This same pattern is found in sexual arousal and orgasm. It is also activated by repetitive, rhythmic stimulation associated with trance-inducing chanting, dancing, meditation — and, of course, sex. Newberg isn't saying sexual and spiritual experiences are the same thing, but rather that they depend on the same neural pathways.

Since the publication of his book, however, Newberg is less interested in peak sexual or mystical experiences than he is in figuring out how to apply what he has learned to the daily stuff of our lives.

To that end, he has developed a model of how spiritual and religious experiences condition our moods, focusing on how the brain releases a cascade of neurotransmitters, such as serotonin, and hormones when engaged in these experiences. (Prozac and other antidepressants called selective serotonin reuptake inhibitors affect moods in a similar way, by slowing the brain's reuptake of serotonin and leaving more of it available.) A study published this year already has proved Newberg's model accurate: Meditators achieved higher levels of a similar neurotransmitter called dopamine, associated with motor function, the euphoria created by ingesting cocaine, and our basic level of happiness. Newberg is waiting for funding to test meditators weeks, months, and even years after practicing, to determine whether it has lasting impact on the physical and emotional body.

"This has tremendous implications for clinical research and psychotherapy," says Newberg. "It's not about saying stop the Prozac, which might be necessary for some, but rather saying that therapy might include spiritual practices. For milder cases of depression, it is possible people could do things like meditation and prayer to avoid medication."

Newberg also has developed a model for the complex neurological process of simple spiritual feelings such as forgiveness.



"Something happens in your brain when you forgive someone, or express love and gratitude," says Newberg. "Humility and altruism all have a philosophical basis, an emotional basis, and a neurological basis. We are just starting to develop techniques to look at these things. The scans have opened a window to a huge variety of experiences and ways of thinking."

Forgiveness, for example, requires a sense of self and of the rest of the world, which comes mainly from the brain's frontal and parietal lobes. We need an emotional memory, which is tied to the hippocampus and the temporal lobes, to recognize when someone has hurt us. Forgiveness also involves a cognitive process of changing our minds, to see a person or problem in a different light. Depending on your nature, this might happen in the limbic system, which is responsible for emotion. If you rely on reason, forgiveness might involve your temporal lobe, the site of analytic and mathematical abilities. If you have a holistic bent, it might involve the right parietal lobe, which creates the feeling of connection.

How you forgive depends on how you access "the system" to re-establish a sense of yourself and create a good feeling, which is relayed to the region that controls behaviour.

"This is what psychotherapy is all about; it's what going to church is all about: how to modify your thoughts and behaviours to feel better and have more success in your relationships. It might help people understand the different ways they are capable of forgiving. It's not a magic bullet, but a way for people to identify how their minds work. If we can figure out what's going on when people stop forgiving or stop loving, maybe we can help them."

This might seem soft and fuzzy stuff coming from a hard-core specialist in nuclear medicine, but at the end of the day, Newberg is a spiritual guy who just happens to have a big brain, a radical optimist who wants to change the world.

"There is a universal quality about the mind," he says. "If you slice everyone's head open, which I don't recommend, you would find pretty much the same thing. Likewise, there is a lot to be said about the universality of religion and spirituality. We all have the same deep questions and we all reach for explanations. Maybe this research can help us get closer together and make the world a better place."

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