

The Science of God

excerpted from the book

How God Changes Your Brain: Breakthrough findings from a Leading Neuroscientist,

by Andrew Newberg, M.D., and Mark Robert Waldman

For the past fifteen years I have investigated the neural mechanisms of spirituality with the same fervor that a minister contemplates God. Some religious rituals do nothing more than relax you, others help to keep you focused and alert, but a few appear to take practitioners into transcendent realms of mystical experience where their entire lives are changed.

Our research team at the University of Pennsylvania has consistently demonstrated that God is part of our consciousness and that the more you think about God, the more you will alter the neural circuitry in specific parts of your brain. And it doesn't matter if you're a Christian or a Jew, a Muslim or a Hindu, or an agnostic or an atheist.

In *Why God Won't Go Away*, I demonstrated that the human brain is uniquely constructed to perceive and generate spiritual realities. Yet it has no way to ascertain the accuracy of such perceptions. Instead, our brain uses logic, reason, intuition, imagination, and emotion to integrate God and the universe into a complex system of personal values, behaviors, and beliefs.

Neuroscience cannot tell you if God does or doesn't exist. In fact, as far as we can tell, most of the human brain does not even worry if the things we see are actually real. Instead it only needs to know if they are useful for survival. If a belief in God provides you with a sense of comfort and security, then God will enhance your life.

The more one contemplates God, the more mysterious God becomes. Some embrace this emergent ambiguity, some are frightened by it, some ignore it, and others reject it in its entirety. But the fact remains that every human brain, from early childhood on, contemplates the possibility that spiritual realms exist.

For the past four years, Mark and I have been studying how different concepts of God affect the human mind. I have brain-scanned



Franciscan nuns as they immersed themselves in the presence of God, and charted the neurological changes as Buddhist practitioners contemplated the universe. I have watched what happens in the brains of Pentecostal practitioners who invited the Holy Spirit to speak to them in tongues, and have seen how the brains of atheists react--and don't react--when they meditate on a concrete image of God.

Along with my research staff at the University of Pennsylvania and the Center for Spirituality and the Mind, we are currently studying Sikhs, Sufis, yoga practitioners, and advanced meditators to map the neurochemical changes caused by spiritual and religious practices. Our research has led us to the following conclusions:

1. Each part of the brain constructs a different perception of God.
2. Every human brain assembles its perception of God in uniquely different ways, thus giving God different qualities of meaning and value.
3. Spiritual practices, even when stripped of religious beliefs, enhance the neural functioning of the brain in ways that improve physical and emotional health.
4. Intense, long-term contemplation of God and other spiritual values appears

to permanently change the structure of those parts of the brain that control our moods, give rise to our conscious notions of self, and shape our sensory perceptions of the world.

5. Contemplative practices strengthen a specific neurological circuit that generates peacefulness, social awareness, and compassion for others.

Spiritual practices also can be used to enhance cognition, communication, and creativity, and over time can even change our neurological perception of reality itself. Yet, it is a reality that we cannot objectively confirm. Instead, our research has led us to conclude that three separate realities intermingle to give us a working model of the world: the reality that actually exists outside of our brain, and two internal realities--maps that our brain constructs about the world. One of these maps is subconscious and primarily concerned with survival and the biological maintenance of the body. But this map is not the world itself; it's just a guide that helps us to navigate the terrain. Human beings, however, construct a second internal reality--a map that reflects our *conscious* awareness of the universe. We know that these two internal maps exist, but we have yet to discover if, and to what degree, these two internal realities communicate with each other.

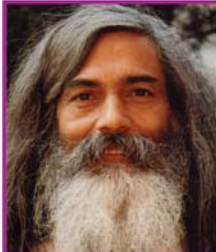
Overall, our consciousness represents a reality that is the farthest removed from the world that exists outside of the brain. Thus, if God does exist, there would be three separate realities to consider: the God that exists in the world, our subconscious perception of that God, and the conscious images and concepts that we construct in a very small part of our frontal, temporal, and parietal lobes. It has been my goal to show that spiritual practices may help us to bridge the chasm between these inner and outer realities. I still don't know if it's possible, but the health benefits associated with meditation and religious ritual cannot be denied.



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