

Neuroscience and Experience of God: The Validity of God's Presence in Individual Religiosity

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Humans have postulated the existence of a transcendent soul capable of interacting with higher being (e.g. God). This soul has no physical limitations and may persist beyond time and space. Likewise, this non-physical component of personhood allows the presence of God to infiltrate the mind to produce genuine religious experiences with such a higher being. In contrast, the physicalist position of neurobiology seeks to attribute religious feelings and experiences to neurochemicals and the precise firing of neurons; the brain is the beginning and end of all religiosity. On the one hand, the idea is that human beings are nothing but collections of neurons firing in response to external signals. On the other hand, there may be a portion of personhood that is unreachable by biology and that constitutes the core of a human being. If neurobiology *is* eventually capable of explaining away every aspect of religious experience, then one might claim that God is not truly present in individual religiosity. But if neurobiology can “explain away” religious experience, then it should also be able to explain away *any* experience including logic and reasoning, the very foundations of science itself. I will explore these ideas in this paper.

Neurobiology and theology comprise two pieces of a jigsaw puzzle that suggest a fairly reasonable match when viewed through Christian lenses. The pieces appear to fit, but when carefully scrutinized through scientific lenses, something just does not line up. The two puzzle pieces have been shoved together in a forceful cohesion but individually possess components that prevent a complete picture of consilient knowledge. Humans, at least as early as Aristotle, have sought to prove the existence of a soul—a portion of mankind that is capable of transcending the physical body and interacting with the gods or a higher being ... or, in Christian thought, God. The soul knows no physical limitations and may persist beyond time and space. Likewise, this non-physical component of personhood allows the presence of God to infiltrate the mind to produce genuine religious

experiences and believable interactions with such a higher being.

In contrast, the physicalist position of neurobiology seeks to attribute religious feelings and experiences to neurochemicals and the precise firing of neurons; the brain is the beginning and end of all religiosity. Thus the question arises—are human beings purely a collection of neurons firing in response to external signals? Is our sole purpose to act on primal instincts, maintain our homeostasis, and simply just survive? Or is there a portion of personhood that is unreachable by biology and that constitutes the core of a human being? If so, there must be pieces of science and theology that are impossible to fit in this jigsaw puzzle. However, if neurobiology *is* eventually capable of explaining away every aspect of religious experience, then is God truly present in the midst of individual religiosity? And if neurobiology can “explain away”

religious experience, why cannot the same be said of *any* experience including logic and reasoning, the very foundations of science itself? These are the questions I will explore in this paper.

Basic Neurobiology and Religious Experience

The work of Eugene G. d'Aquili and Andrew D. Newberg in the early 1990's solidified understanding the interface between neurobiology and religious experience. They clearly stated that their research was intended to "contribute to the understanding of intense religious and spiritual experience in a more scientific form than one usually encounters."¹ Their research did not seek to discredit religious foundations, faith, or the presence of a divine Creator; rather, they concentrated purely on brain functioning during religious phenomena and what structures appear to be the most heavily involved during such experiences.

They identified four areas of the brain (along with the limbic system) that were involved in the origination of a mystical state, a sense of a certain unity with the divine and the subjective experience of it. These four areas included the posterior superior parietal lobule (PSPL), inferior temporal lobule (ITL), inferior parietal lobule (IPL), and the prefrontal cortex.² The PSPL is involved in the assimilation and analysis of visual, auditory, and somesthetic information. It also possesses the capability of simulating a three-dimensional object floating through space. Specifically, the right PSPL plays the main role in spatial orientation. The ITL analyzes the entire visual field while receiving

information from the PSPL about objects within or outside of grasping distance, and then allows such objects to become the center of interest and fixation. The IPL is distinguished as an association area and plays an important role in attaching words to abstract concepts and it helps in ordering, naming, and categorizing objects. Finally, the prefrontal cortex works to dictate future behavior, weigh consequences and implications of decisions, aid in concentration, and drive a sense of one's intentionality.³

Newberg and d'Aquili postulated that these four main structures functioned alongside the limbic system in the midst of religious episodes and feelings.⁴ The limbic system as a whole is largely responsible for the production of visual imagery, memory, and the interpretation of emotion such as aggression, fear, pleasure, love, and heightened feelings of sexual or religious excitement. It is composed of the hypothalamus, amygdala, and hippocampus.⁵ The hypothalamus induces primitive motivational states that are the essential keys to survival, such as the need to eat or drink. The amygdala facilitates the formation and storage of memories associated with emotions, particularly those of fear or aggression.⁶ The other major component of the limbic system is the hippocampus, which works to mediate the extreme effects of the hypothalamus and amygdala. This structure also acts as a final coordinator of complex memory by unifying inputs from various secondary and tertiary association areas.⁷

The initiation of a religious experience begins with the center of human

¹ d'Aquili & Newberg, 1993, p. 177.

² *ibid.*, p. 180-181.

³ *ibid.*, p. 183-184.

⁴ *ibid.*

⁵ It also includes the cingulate gyrus, epithalamus, dentate gyrus and entorhinal cortex.

⁶ Mauer, 2012, p. 4.

⁷ *ibid.*

intentionality: the prefrontal cortex. While spontaneous religious experiences may be valid, they comprise a separate category. So, we will focus on deliberate spiritual episodes in which the individual consciously strives to unite with God. The individual begins by clearing the mind, which may result in partial deafferentation of the right posterior superior parietal lobule. Deafferentation is defined here as the halting of neural input or stimuli. This catalyzes a chain of neural reactions: the partial deafferentation of the PSPL also blocks any input from the inferior parietal lobule, resulting in stimulation of the hippocampus and consequently the amygdala. Such a neural reaction produces feelings of deep relaxation and eventually an intense quiescence.⁸

Experience of the AUB

Once the individual attains this level of meditation, they have become privy to the mental state defined as Absolute Unitary Being (AUB), “a state of rapturous transcendence and absolute wholeness which carries such overwhelming power and strength with it that the subject has the sense of experiencing absolute reality.”⁹ Following this level of achievement, the subject may either experience a sustained level of ecstasy or a profound Void. The first situation carries with it a personally meaningful weight and is often interpreted as an encounter with God, while the latter circumstance is typically interpreted as nothing more than an impersonal peacefulness or feelings of emptiness. The level of meditation that indicates an encounter with a “higher spiritual Being” will be the focus of this discussion.

It is beyond the scope of science to adjudicate whether this stimulation of brain structures, combined with the subjective feelings of the individual, can be attributed to encountering a particular conception of God or proof of such a being that exists outside of the physical realm.

Newberg and d’Aquili represent this meditative state of mind as a union between God and the individual that is “so perfect and so complete that an observer, if such were possible, could not perceive where one ended and the other began...one often hears it is said that in profound mystical experiences such as AUB the self becomes as a drop of water in the ocean of reality.”¹⁰ However, this could also be interpreted in a slightly different way. Rather than painting the individual as an insignificant piece of a much more expansive picture, the self might actually expand to become everything embodied by reality.

Regardless of the interpretation, attaining Absolute Unitary Being through the processes of deafferentation of the posterior superior parietal lobule, stimulation of the hippocampus and amygdala, and neural ping-pong reactions appears to open spiritual pathways for the merging of theology and neurobiology—the spiritual and physical. The seemingly incoherent puzzle pieces give the allusion of an ideal match and suggest that these two separate realms may co-exist in the individual.

A Philosophical Caveat

However, upon closer examination, these studies reveal flaws that cause one to question where the science ends and God begins. Do these scientific findings truthfully demonstrate a union with a divine

⁸ op. cit. ref. 1, p. 188-189.

⁹ *ibid.*, p. 189. This definition of an AUB is such that it includes whatever cultural description may be

associated with the supreme being of whatever religious group to which one belongs.

¹⁰ d’Aquili & Newberg, 2000, p. 47.

being with the physical body? Or is the mind capable of crafting such elaborate fabrications that it is impossible to decipher the true presence of God? In an attempt to safeguard their findings from being reduced to merely neurochemical fluxes and the imaginative capacity of the brain, d'Aquili and Newberg state that to "maintain the reality of a person's 'objective' experience of God is reducible to neurochemical flux and nothing more may be equivalent to maintaining that the person's experience of the 'objective' reality of the sun, the earth, and the air we breathe is reducible to neurochemical flux."¹¹ They argue that mystical objectivity should be placed on the same grounds as physical or visual objectivity; doubting the validity of another's personal interpretation is not possible simply because there are no rules to govern individual perceptions.¹²

Philosopher Jerome Gellman applauds the work of d'Aquili and Newberg for its consistency of explanation regarding all aspects of mystical experiences.¹³ He commends them for their unfaltering ability to pinpoint the relation of certain brain structures and neural activity with particular mystical and religious experiences; however, Gellman capitalizes on the hidden reductionist pressures of their research that may discredit the actual presence of God. He analyzes the above quote by d'Aquili and Newberg and ascertains that some type of object undoubtedly serves as the focal point during mystical experiences. However, Gellman believes that the object of these supposed 'God-perceptions' might very easily be something less specific than an actual divine Being and that the 'God-details' are supplied by the brain and the

individual's choice to interpret these experiences through a theistic lens.¹⁴ Consequently, a wide array of external factors now challenges the assumption that a supreme being such as God, without a social context or tradition, is the indisputable subject behind these religious encounters.

The Role of Tradition and Enculturation

Cultural conditioning serves as a major influence in the perception of a God encounter. If the individual has been raised in a family or society that encourages faith and a close relationship with God, they will be highly apt to attribute any mystical experience to God's presence. Their surroundings and upbringing condition them for certain subjective interpretations.

Consider two individuals who are observing a sunset: one might be quick to feel the beauty of God and His glorious creation, while the other might simply feel an appreciation for lovely scenery and nothing more. Consider also another situation in which two survivors, one raised in a highly religious home and one in a minimally religious home, walk away from a car crash completely unscathed. The first would likely attribute his or her survival to God's presence and divine intervention, while the latter would be thankful for blind luck and fortunate escape from death's door. These two individuals undergo identical situations, yet interpret the experiences in light of whatever tradition and culture taught them. For the individual that has not been exposed to any form of religious thought, would it even be possible to interpret these episodes theologically? How can they attribute an experience to a divine Creator when the

¹¹ op. cit. ref. 1, p. 197.

¹² See also Plantinga (1993) for a deeper philosophical and theological position on this same theme.

¹³ Gellman, 2001, p. 97.

¹⁴ *ibid.*

thought of God has never even been introduced?

A case study conducted in 2001 supports the idea of cultural conditioning for religious experience. A group of Protestant Christians, convinced that the biblical text was literally God's word, was administered PET scans during times in which they claimed to be in a typical religious state. Aside from the limbic system, the areas of most active brain stimulation were those associated with learned cognitive activity.¹⁵ This study reinforces the idea that the individual's personal perspective and learned behavior is central to the religious interpretation. Gellman's accusation of reductionism holds fast in this situation. While the brain may show the expected stimulations and neural happenings, the individual's cultural conditioning and choice interpretation cloud the legitimacy of the actual presence of only one conception of God's actual presence.

Drug-induced Religious Experience

Another method of creating a God perception involves the use of drugs such as lysergic acid diethylamide (LSD), psilocybin, and mescaline. These hallucinogens artificially activate the temporal lobe, hippocampus, and amygdala to initiate intense religious and spiritual experiences. Auditory and visual hallucinations are common as well as claims to be seeing and interacting with otherworldly spirits such as God.¹⁶ These drugs have been observed as the center of religious ceremonies in which 'hallucinogen ingestion sessions' are conducted, affording a vast majority of its users some type of vision ranging from general religious

imagery to interactions with religious figures.¹⁷

Neural Disorder & Religious Experience

Neural disorders such as epilepsy serve as another example of how the brain supplies the God perception. Patients who suffer from this type of disorder often report religious experiences such as hyperreligiosity, hypermoralism, elevated mood, and increased philosophical or cosmological concerns due to abnormal activation of the limbic system. Even though these behaviors are non-normative, epileptics are typically conscious and in a clear state of mind during these episodes. The association of epilepsy and religious episodes has even been applied to historic religious figures such as Abraham, Ezekiel, and Lot. Researchers have hypothesized that their religious fervor and odd visions may have been a result of a neurological disorder such as epilepsy rather than pure spiritual zeal.¹⁸ Individuals with Parkinson's disease (PD) also display a correlation between religiosity and brain function. Many individuals diagnosed with PD report significant alterations in their religious habits—some undergo "intense conversion experiences" while others experience a new apathy to their previously active faith.¹⁹ These neural disorders further the claim that religiosity stems from the physical brain functioning of the individual.

Is Resolution Possible?

After observing the various ways that a God perception may enter the brain, it is extremely difficult to confidently assume that a unitary divine being enters the brain during the midst of any religious experience. Cultural conditioning allows the religious individual to choose which conception of

¹⁵ Azari & Birnbacher, 2004, p. 911.

¹⁶ op. cit. ref. 6, p. 7-8.

¹⁷ ibid.

¹⁸ op. cit. ref. 6, p. 6-7.

¹⁹ Wildman & McNamara, 2008, p. 224.

God's presence regardless of its validity, and doesn't even afford the choice for the unexposed individual. Drugs have the capability of manipulating the brain and construing false images and feelings, and neural disorders internally fabricate religious experiences against the individual's will. If God is supposedly present in the midst of all of these vastly different situations, then how can His presence be proven when separated from these external factors? Is there a method to completely isolate His presence and prove beyond a doubt that religious experiences may extend beyond simple tricks of the mind?

Despite the complications in discerning the differences between the brain's fabrications and God's genuine presence, there are still some reasons why religious experiences may remain valid. Taken at face value, the d'Aquili and Newberg theory describes what is happening in the brain only during a God, or AUB, perception. The theory does not account for any experiences that may precede or follow the central episode. If brain activity can only be detected exactly during the time of the perception, then it is impossible to decipher whether or not the religious feelings or encounters are entirely internal or external when its original sources cannot be traced. Gellman states, "We should reject any attempt to conclude that the ultimate cause for a theory's favored brain events is altogether internal to the organism and internal especially to the brain. Instead, we can happily accept the favored brain events and ascribe their very occurrence to an external cause, God."²⁰

But does the brain *only* operate through interpreting external objects? It cannot be denied that any perception is the effect of a physical object or stimuli. Specifics paths

for vision, smell, touch, taste, and sound can all be traced from their position outside of the body, through specific receptors, and up to the brain for interpretation. However, God is not a physical entity. There are no "God-receptors" on the body analogous to the retina or touch receptors that process the information to send to the brain. As a result, Gellman contends that there is a profound difference between physical perceptions and God perceptions.²¹ God's presence is often denied because the process of tracing this particular stimulus cannot be done as methodically or confidently as sensory perceptions. The absence of God-receptors might seem to serve as conclusive evidence that a divine Being is not truly entering the mind; however, the key point here is that God is not physical and therefore does not work through physical receptors. To reinforce this point, Gellman states "perceptual receptors that feed into the brain are to be expected and sought for when dealing with a physical stimulus, but not with non-physical stimuli as in mystical experiences of God."²² Rather than acting through a receptor, God may somehow act directly upon the brain to bring about these perceptions.

Conclusion

It may not be feasible to ever completely separate or combine neuroscience and religion. Newberg and d'Aquili provided the undeniable correlation between brain activity and religious experiences, but the genuine presence of a divine Being during these episodes cannot be conclusively accepted or dismissed. Cultural conditioning, the presence of drugs, and neurological disorders all provide the creative intricacies of neural firing in the brain and its ability to either voluntarily or involuntarily fabricate God perceptions.

²⁰ op. cit. ref. 13, p. 99.

²¹ *ibid.*

²² *ibid.*, p. 100.

While these support the idea that all religiosity is internal to the individual, the distinction between physical and non-physical perception and the primary source of stimuli make it difficult to discount the validity of religious experiences. It would be parsimonious to cease the attempt to pinpoint God's presence and simply accept the individual's subjective opinion as personally truthful. Nina Azari and Dieter Birnbacher simplify the argument by stating that religious experience is a matter of "thinking that feels like something."²³

Cognitive ability undoubtedly plays a major role in religious experiences, but proving the existence of a union between the spiritual and physical depends on the traditions and culture in which the feelings and emotions of the individual were learned. There are some areas of the psychical realm that no amount of scientific testing and analysis seem able to touch; an individual's personal religious experience stands firmly as one of those realms. The puzzle pieces may seem to match but, in the end, it is a forced fit.

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²³ op. cit. ref. 15, p. 915.