

Current Advances in Neurotheology

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A report in the Daily Mail on April 12th 2012 stated 'the God spot revealed; scientists find the area of the brain responsible for spirituality'. Over the last twenty years, there has been emergent interest in the brain correlates of religious experience. Neurotheology investigates correlations of neural phenomena with subjective experiences of spirituality and hypothesises to explain this phenomenon. It accounts for religious experience and behaviour in neuroscientific terms. It is also called spiritual neuroscience.

Neurotheologians address a variety of spiritual experiences – oneness with the universe; spiritual awe; perception of time, fear or self-consciousness that has dissolved and ecstatic experience. Aldous Huxley first used the term in 1962 in his novel *'Island'*, where Will Barnaby, a journalist whose boss also owns South East Asia Petroleum finds himself shipwrecked on the island. The term was also popularised by Lawrence McKinney in his book *'Neurotheology, Virtual Religion in the Twenty First Century'*.

There are two types of Neurotheology – reductionists and religionists. Reductive neuroscience aims to disapprove the reality or importance of religion and to replace it with non-mysterious neurological functions. Persinger (1987) states, 'God is simply the name given to a supposed external cause of sensations and sentiments that are, strictly speaking, no more than neurological accidents'. Religionists attempt to demystify or demythologise religion without in any way dismissing its value and meanings. For them neurotheology is a revised version of natural theology in which conclusions about the existence and nature of God can be derived in the specific features of a particular significant aspect of nature - in this case the human brain.

First, I want to consider temporal lobe epilepsy. There is historical evidence that damage to the temporal lobe, particularly the right hemisphere, leads to hyper-religiosity. This may include obsessions over religious characters, texts and ideals. In these episodes, patients meet God during seizures and act in religiously significant ways. There is a heightened response to religious language, specifically religious terms and icons. As one sufferer said on a BBC Horizons programme in 2003, she became convinced she had given birth to Christ. She had intense visual hallucinations and physical reactions within the late stages of labour.

There has been much debate as to the authenticity of religious experiences during temporal lobe epilepsy. Observations on the relationship between religion and temporal lobe epilepsy are not new. Esquire in the 1850s was one of the first to describe this. A text called *Clinical Lectures on Mental Diseases* also mentioned this association. There have been a number of in-depth studies, such as Dewhurst (1970) suggesting such a relationship. It is hypothesised that in temporal lobe epilepsy the physical reaction of the temporal cortex and the limbic system, specifically the amygdala, which is the seat of high emotion and the hippocampus as the seat of stored memory and experience, is to become hyper-stimulated. As the psychologist Richard Bentall (1990), notes, sometimes there is

mis-attribution of the inner voice during periods of sensory isolation. Broca's area of the brain remains active during meditation and seizure activity. The restriction of sensory information causes Broca's area to misjudge the internal voice as one generated by external stimuli - hence hearing the voice of God.

Psychologist, Michael Persinger who uses the famous 'God helmet', has conducted another line of research. The God helmet creates a magnetic field, which stimulates minor epileptiform seizures in the temporal lobe, particularly in the medulla and the hippocampus. There has been much debate about whether his results are replicable. To date they have not been and others have suggested his results are due to suggestibility.

Thirdly, drugs such as Peyote and Psilocybin can stimulate religious experience. Lilly (1972), experienced the presence of a spiritual-God after combining sensory and social isolation with taking LSD. There is debate as to whether such drug-induced states are the same as spontaneous mystical experiences.

Ramachandran and Blakeslee (1998) used the galvanic skin response to look at the response of patients with temporal lobe epilepsy to religious stimuli. They found hyperactivation of the galvanic skin response in these subjects compared to those without temporal lobe epilepsy. The authors speculate that temporal lobe epilepsy is associated with damage to the amygdala, which influences emotional reaction.

Much of the work on scanning has been conducted by Andrew Newberg and Eugene Aquili (2001), who have used SPECT scanning to look at nuns and Buddhist monks meditating. Their findings suggest that during meditation there is activation of the prefrontal cortex and de-afferentiation of the parietal lobe. This lack of stimulus of the parietal lobe leads to a dissolution of the self and feeling of absolute unitary of being, in which a person loses the sense of self, time and space and becomes encompassed in the whole universe. These results have been replicated by others. Newberg argues that these experiences occur when the hippocampus blocks the neural flow in the parietal lobe, leading to sensations associated with loss of deafferentiation between the self and non-self. Others such as Johnson have found other areas activated during prayer and meditation. He concludes that spiritual experiences can be associated with activation of a number of brain regions.

These studies are somewhat problematic in that in order to report when subjects reach a mystical state, it is necessary to intrude upon the activity in some way to indicate what is happening. This may significantly influence the results of the study. Overall convincing evidence for a God spot is lacking. Johnson argues spirituality is much more dynamic concept that uses many parts of the brain working together to facilitate individual spiritual experience. There are a number of problems with this field. Runehov (2007) argues that brain scans are unable to detect any objective experience. They refer merely to neuronal activity. In other words, the blue or red or yellow spots neuroscientists see on the screen of the SPECT when scanning the brain of a meditator experiencing unitary being or eating apple pie are pictures of neurochemistry and not pictures of God or pie. In addition, these studies present images of brain activity and do not explain how religious experience comes about. Then there is the problem of localisation. Any area of the brain activated during a particular activity does not define the specific area underlying that particular

experience – for it may be part of a much larger connected area. The data does, however, have an implication for the mind-body problem. Is the mind tied to the brain? We can ask a similar question about the soul.

How do these results affect the way we may see the spiritual realm or the possibility of rational spiritual discourse? Does neurotheology disprove God's existence? Is it just activation of brain cells? Alternatively, as many theists and believers advocate, does it prove that God exists and that there is an area of the brain which 'receives' God, i.e. a natural form of theology?

Overall, we can conclude that neurotheology shows the brain's involvement in the act of faith but it does not reveal anything meaningful about the content of such experiences, nor does it reveal anything about their cause, or about acts of faith. We can learn something about the association of specific neural responses with certain self-reports but we can conclude nothing about their causation such as the reality of a divine source.

Finally, scanning studies focus upon exceptional religious experiences such as mysticism and ignore the religious experience of 'ordinary believers'. These are relatively rare amongst religious believers. Also, as William James pointed out in his term 'Medical Materialism', the fact that we can identify neural activity with particular experiences does not discredit that experience.

In conclusion, I would argue that although faith may be associated with certain brain changes, we cannot understand religion unless we see it in its culturally and social embedded context.

References

Bentall R.P. The illusion of reality: A review and integration of psychological research on hallucinations. *Psychological Bulletin*, 107(1):82-95, 1990.

Dewhurst K, Beard AW. Sudden religious conversions in temporal lobe epilepsy. *Br J Psychiatry*. 1970 Nov; 117(540):497-507.

Lilly J. *The Centre of the Cyclone*: Julian Press, New York, 1972

Newberg A, and D'Aquili, E. *Why God Won't Go Away: Brain Science and the Biology of Belief*. Ballantine, 2001.

Persinger MA. *Neuropsychological bases of God beliefs*. New York: Praeger. 1987.

Ramachandran V and Blakeslee S. *Phantoms in the Brain: Probing the Mysteries of the Human Mind*. Harper Collins, 1998.

Runehov ALC. *Sacred or neural? The potential of neuroscience to explain religious experience*. Göttingen: Vandenhoeck & Ruprecht. 2007.