

Is Neuroscience Challenging the Pentecostal View of Spiritual Experiences and Practice?

Mark Pretorius

Abstract

It is difficult to describe the relationship of Pentecostals² to the natural sciences concerning spiritual experiences and practice as proposed by Amos Yong (2011)³ a pentecostal scholar, since most Pentecostals seemingly advocate a fundamentalist worldview. This often results in epistemic boundaries vis-à-vis the value of natural science in better understanding spiritual experiences and practice. Yet, one cannot ignore that the natural sciences are making tremendous progress in understanding the cognitive side to these experiences. Admittedly, how to engage faith and science meaningfully within a fundamental worldview on this, is challenging.

Nevertheless, for any meaningful discussion to happen, the Pentecostals *ontological* framework (their contention of reality) will need modification in accommodating new empirical insight by especially neuroscience concerning the reality of spiritual experiences and practice. If not, they will remain bound to old methods and understanding on this topic and remove themselves from arguments concerning science and their value in better understanding these various experiences and especially their benefit to Pentecostals in general.

About the Author¹

PhD, UP.

Dr Pretorius (Senior Academic, SATS) is a research associate in the department of Dogmatics and Ethics at the University of Pretoria. Mark has published a number of books and papers, specialising in the field of science and theology.

1 The views expressed herein are those of the author and do not necessarily represent the beliefs of the South African Theological Seminary.

2 Note that in referring to pentecostalism, I am also framing my questions and answers to include the Charismatic view of spiritual experiences.

3 *The Spirit of Creation: Modern Science and Divine Action in the Pentecostal-Charismatic Imagination* (2011).

1. Introduction

To begin, the aim of this paper is threefold. 1. To show that neurobiology (natural science) and spiritual experiences (Christian theology) are mutually exclusive, thus there should be minimal tension between science and faith. 2. To advocate that the Holy Spirit is the one that manifests true spiritual experiences within the neurobiology of the brain. 3. That there is a growing body of empirical research by science suggesting how the brain displays these experiences, which cannot be ignored.⁴

Concerning my presuppositions, two statements are necessary. 1. I imply that 'spiritual experiences' are not the sole domain of Christian faith, but are phenomena commonly found in other faiths, albeit counterfeit in relation to scripture. 2. I acknowledge that there is *prima facie* evidence that the Holy Spirit coordinates with the biology of the brain to generate valid spiritual experiences. The paper will also consider what frames a spiritual experience from a theological and neurobiological perspective, and briefly contest what is generally considered a spiritual experience from a religious one.

2. Pentecostalism and the Church

Few would argue that Pentecostal churches constitute the fastest growing group of churches in Christianity today, and, according to Anderson (2004), represent approximately a quarter of all Christians worldwide. He adds that according to some often-quoted estimates, there are over 500 million Pentecostals worldwide. (cf. Barrett and Johnson 2003:25). It is also estimated that they have representation in almost every country worldwide. But, pentecostalism as a classification does not stand alone, since within their broad ranks they have the classical Pentecostals on the one side, and the older Charismatic and newer *Third-wave* and *Neo-Charismatic* movements on the other.⁵ However, what unifies the various movements is a shared belief in and emphasis on the supernatural work of God and spiritual experiences, including divine healing, tongues, prophecy, and modern-day miracles. But, introducing the question of spiritual experiences into the science and theology dialogue does raise several epistemological questions.

But, before dealing with this, I would like to briefly unpack the Pentecostals' relationship with science, and then propose an empirically plausible framework from the cognitive sciences, on how they could possibly approach and perhaps engage a scientific view of spiritual experiences.

⁴ Please note that some information in this paper was used from two previous papers the author published, namely: 'A Metaphysical and Neuropsychological Assessment of Musical Tones to Relax the Mind, Affect the Brain and Heal the Body', *Verbum et Ecclesia* Vol 38, (1) 2017, and 'Is Consciousness a Product of the Brain, or/and a Divine Act of God? Concise Insights from Neuroscience and Christian Theology', *HTS Theological Studies* 72(4), 2016.

⁵ Pew Research (2011) estimates that the number of Neo-Charismatics is approximately 300 million, while Burgess and van der Maas (2002:286-287) propose that there are some 19,000 denominations or groups who identify themselves as Neo-Charismatic.

3. Pentecostalism and its Relationship with the Natural Sciences

Defining pentecostalism and its relationship to the natural sciences including its understanding of reality, is no easy task. Unfortunately, when one is fundamentally limited to the parameters of one's own reality, whether it be by dogma, a worldview or perhaps a specific methodological approach, this reality becomes, by default, closed, resulting in stagnation and ignorance on what science can offer. As suggested by Yong (2011:3) 'The legacy of this anti-intellectualism has been the reluctance, even in Pentecostal academy, to seriously engage modern science *until now*'.

What Yong means by '*until now*', is that in 2008 several pentecostal scholars gathered to address this very issue at a conference entitled '*Signs, Sighs, and Significance: Pentecostal and Wesleyan Explorations of Science and Creation*.' From their various reflections on science and theology emerged a significant volume of essays entitled '*The Spirit Renews the Face of the Earth: Pentecostal Forays in Science and Theology of Creation*', edited by Amos Young. To date, there have been similar conferences held which have, amongst others, themes related to discussing science and theology. Seemingly, pentecostals are engaging the sciences, but generally there is still much resistance to science in the wider framework of Pentecostals. However, this paper will briefly pursue a narrower and equally important study concerning especially, the cognitive side of spiritual experiences and practice and what neuroscience can say to Pentecostals on this. But before addressing this, let me briefly state my ideas on the relationship between science and theology.

4. The Relationship Between Natural Science and Theology

There seems to be a perception that science and theology need to *integrate* to make sense, but this is a false perception. My reasoning relates to the four models proposed by Ian Barbour (2000) concerning science and theology's relationship. He proposes a framework for modelling the interaction between the two fields which consists of *Conflict, Independence, Dialogue* and *Integration*. Most scholars interested in advancing the scholarly field of science and theology prefer the dialogue model, since it respects both disciplines and rather sees truth as holistic; thus it promotes dialogue and complementarity between science and theology on issues which especially lie at the interface of both disciplines. This

model differs, to a certain point, the *non-overlapping magisteria* (NOMA) proposed by Stephen Jay Gould (1997:16–22) that science and religion each represent different areas of inquiry, thus they must remain independent of each other. But, it does address the conflict model of Barbour, since Gould is clear in his essay that no such conflict should exist since each discipline has a legitimate magisterium, or domain of teaching authority. The dialogue model still respects Gould's view of the independence of both domains, but proposes there must be an exchange of ideas through dialogue.

Approaching the science and theology discussion from this perspective, should ease the concerns of Pentecostals since each domain remains independent to pursue their individual ontological ideas of reality, but do seek dialogue, where necessary. In such cases, each one's epistemological framework expands through dialogue, and understanding of reality, from both domains, matures. But, in the broader scope of reality, consideration must be given to the role of metaphysics in understanding reality.

- **The Role of Metaphysics in Theology**

In referring to reality, one must also consider the two broad ontological conceptions of what science and theology consist of when considered through the lens of *metaphysics*, since metaphysics is concerned not only with the nature of things that exist in space and time, but also with the nature of things that may not. Thus, in studying the reality of spiritual experiences, one's epistemic framework must include the crucial role of metaphysics, especially in theology, since one of the objectives of metaphysics is to understand *ultimate reality*, specifically *First Principles* of phenomena. First principles, within a Christian framework, are God and his work in creation, notably in revealing more of himself within scripture and the sphere of spiritual experiences.

- **Metaphysics and the Limits of Science**

Although science may observe the chemical process of a spiritual event, it is limited in observing a person's thoughts, meaning, the inner workings of their *mind*, neither does it observe how the Holy Spirit (first principle cause) merging within the neural networks of the brain, can generate spiritual events. Generally, science seeks to explain certain basic and ubiquitous phenomena in the natural world, that is, in the realm of things that exist in space and time. Hence, its epistemic framework is limited to a closed universe where reductionism governs and restricts its ontological branch of metaphysics.

However, with current technology, such as fMRI's, SPECT and PET scans, it is now possible for neuroscience to observe changes in brain structures during a spiritual experience. It is at this junction where I believe that through dialogue, Pentecostals can benefit from science. The one can explain the rational (through empirical studies), while the other can explain the irrational; or the *metaphysical* how, of a spiritual experience.

5. Neuroscience and the Aetiology of Spiritual Experiences

As proposed, scientific epistemology depends on observation and rigorous empirical investigation to acquire information, while theological epistemology is concerned with a rigorous pursuit to understand first-cause principles, such as the God of creation. The question is: how can each domain – particularly neuroscience – help, specifically Pentecostals, to further appreciate spiritual experiences?

For several decades now, numerous neuroscientists such as Newberg and Waldman (2010; 2006), Verghese (2008), Beauregard and O'Leary (2007), Giovannoli (2001), D'Aquili and Newberg (1999), have been intrigued by the idea of religious experiences, and have sought through rigorous empirical investigation, to reveal how various participants came to experience the process of a religious experience and what was the result. As stressed by McNamara (2009: xi), in hundreds of clinical cases and through neuroimaging studies, empirical evidence has concluded that the amygdala, large portions of the prefrontal lobe and anterior temporal cortex are repeatedly implicated in expression of religious experiences. However, other brain regions are also stimulated, depending on what type of activity is performed

These studies have further shown that religiosity and spiritual experiences do involve genes related to the brain's dopamine and serotonin neurotransmitters. For example, McNamara (2009:63) suspects that religiosity links to dopamine activity in the prefrontal lobes, while Giordano and Engebretson (2006:187, 196) propose that it begins in the networks of the brainstem's reticular system. This then brings into play the midbrain dopaminergic pathways releasing dopamine in networks of the forebrain, thus creating a religious - or as they put it - a mystical experience. Several scientists have also zeroed in on serotonin and the serotonin system as the main triggers of a religious or transcendent experience (see Hagerty 2009: ch 6). Today, by

careful interpretation of the empirical evidence available, we can appreciate that the brain manifests spiritual experiences.

It is important to note that neuroscience hardly uses the term spiritual experiences, but prefers the term religious or mystical experiences. Why? As offered, there are many case studies showing how religious experiences, which encompass all religions, manifest via structures of the brain, but my assumption is that they have little or no value holistically to the person or persons, since they are, by default, created through sense experience, or, as proposed by Griffiths and Richards et al. (2006:268-283) and MacLean, Johnson and Griffiths (2011:1453-1461), through ingesting a hallucinogenic drug. It was further discovered that a lack of the neurotransmitter serotonin, can equally trigger hallucinations which can be incorrectly interpreted as a religious or mystical experience by the person, since these experiences are, by nature, subjective [*qualia experiences*] as put forward by Bentall (1990:82-95).

My presupposition concerning spiritual experiences is that God, by the immanent presence of His Spirit in believers, works within the networks of our brain to manifest *valid* spiritual experiences. But, unlike religious experiences which by nature are *epiphenomenal*, God-stimulated experiences have purpose, value and bring about godly change in thinking and behaviour, by a process called neuroplasticity, which results in spiritual formation.

6. Neuroplasticity and Spiritual Transformation

It is important to consider that the overall purpose of spiritual experiences is to edify the church in general (1 Cor 12: 7; 14:3; 26) and particularly individual believers, concerning their own spiritual transformation (Phil 2:13). As proposed by Willard (2002:109), spiritual transformation 'is achieved by the ministry of the Spirit [amid] necessary and well-directed efforts' such as spiritual experiences and practice which can transform thinking towards God. Here, I am specifically referring to neuroplasticity, the brain being able to transform its neural pathways and alter behaviour.

Simply put, neuroplasticity is the brain's capacity to affect change (whether good or bad) in response to regular stimuli. My assumption is that this neurological change is accelerated if the stimuli are a result of the Holy Spirit working within the synapses of our brains. As proposed by Moll (2014:163), the emotional nature of spiritual experiences helps us to change, especially since they affect the nervous system and thereby release chemicals (e.g.

serotonin and dopamine) which enhance neural connections and in the process, rewire the brain, change thinking, leading to spiritual transformation. I consider this key in better understanding the process of sanctification, especially as an inner progressive work through various practical and spiritual experiences (see John 17:18-19; Phil 1:6; 2 Pet 3:18). But how do we know that God, has manifested the spiritual experience, rather than our own thoughts? I would briefly like to answer this under two headings.

8. 'Warranted Christian Belief' and the Brain

Part of the title of this section, relates to Alvin Plantinga's excellent book 'Warranted Christian belief'. In it, he makes a case for knowing that God exists through the intrinsic witness of the Holy Spirit within parts of our *cognitive faculty* which generate beliefs in us (2000:266–272). He refers specifically to what Paul writes in Romans 1,

For the wrath of God is revealed from heaven against all ungodliness and wickedness of men who by their wickedness suppress the truth. For what can be known about God is plain to them, because God has shown it to them. Ever since the creation of the world his invisible nature, namely, his eternal power and deity, has been clearly perceived in the things that have been made. So, they are without excuse. (Romans 1:18–20).

In Plantinga's view, this is probably one of the most widely used segments of the Bible to propose that God has given us an innate cognitive faculty for knowing he exists. I concede that there are good arguments against using Romans 1 (see Young 2000:695–707), but when one weaves this view with what neuroscience reveals, it makes the argument plausible that God has implanted mechanisms within the brain to know him. Here, we may argue from the following two premises. 1. We have the *internal instigation of the Holy Spirit* (IIHS) proposed by Plantinga (2000:265); and 2. John Calvin's *sensus divinitatis* (sense of divinity). Indirectly, these ideas maintain that a belief in God is generated naturally and directly by a God-implanted cognitive faculty [*cognitio Dei insita*] that needs no reasoning, meaning it is a natural and direct product of the emergence of the brain (see Clark and Barrett 2010:174–189). Calvin further declares that the *sensus divinitatis*⁸ is 'not a doctrine which is first learned at school, but one as to which every man is, from the womb, his own master' (I.iii.3). Correspondingly, Thomas Aquinas proposes 'To know in a general and confused way that God exists is implanted in us by nature [*cognitio Dei naturalis insita*]' (I, q. 2, a. 1, ad 1).

⁸ As proposed by Plantinga (2000:149) 'The *sensus divinitatis* is a belief-producing faculty (or power, or mechanism) that under the right conditions produces belief that isn't evidentially based on other beliefs'.

Pannenberg (1988:1:95.) proposes a slight modification by saying ‘Christian theology has held from its beginning that a natural knowledge of God is self-evident by virtue of being part of the created realm’.

From a neuroscientific perspective, Newberg (2009:54–56) suggests that people become conscious of God through an activation of their *thalamus*, which he refers to as the *Grand Central Station* of sensory processing. However, Platina (2000:126-127) proposes one caveat to all of this; that to know that God is the author of the experiences, brain faculties must function optimally to deliver this true belief. Nevertheless, the most authoritative evidence of God working in Christians is the presence of the Holy Spirit.

9. The Immanent Spirit

In Luke 24:49, before Jesus ascended to heaven, he told his disciples that he was going to *send* them an empowerment from on high. We then see in Acts 1:8, shortly before Jesus’ ascension, he specifically promised his followers that they would be imbued with power when the Holy Spirit *comes* on them.

As offered by Pretorius and Liroy (2012:71–72), when people are exposed to a surging inflow of spiritual energy, they become overwhelmed and some of their brain functions are temporarily altered, as confirmed by the various neurological studies mentioned. This flow of the Holy Spirit’s power into believers heightens their supernatural awareness and creates a reservoir of energy within them. It should therefore not surprise, that during this influx of energy brain functions are altered, and people often have a spiritual experience.

10. Conclusion

My proposal throughout this paper was to show that it is epistemically possible for Pentecostals to embrace the natural science and their ideas of, for example, what neuroscience reveals concerning the cognitive side to spiritual experiences, without having to compromise their basic doctrines of God’s immanence and work in creation. I further considered that there is *prima facie* evidence from neuroscience and scripture, showing a causal relationship between the Holy Spirit, the brain and the emergence of spiritual experiences. Additionally, reference was made to current empirical research which helps us better understand the importance of keeping our minds focused, which directly impacts the brain and nervous system, affecting behaviour.

Expectantly, this should encourage Pentecostals to consider neuroscience's work on this, and appreciate its importance and significance to the work of the Holy Spirit, especially in spiritual transformation. With conviction, I propose the information presented could work well within Pentecostalism's doctrinal framework of the Holy Spirit's work in creation, since all neuroscience is doing, is revealing the inner workings of the brain and possibly, how God generates spiritual experiences.

Reference List

- Anderson A 2004. *An introduction to pentecostalism: Global Charismatic Christianity*. UK: Cambridge University Press.
- Barbour I 2000. *When science meets religion: Enemies, strangers or partners*. New York: HarperCollins Publishers.
- Barrett DB and Johnson MJ 2003. Annual statistical table on global missions. *International Bulletin on Missionary Research* 27:1–25.
- Beauregard M and O'Leary D 2007. *The spiritual brain: A neuroscientists case for the existence of the soul*. New York: HarperCollins.
- Bentall RP 1990. The illusion of reality: A review and integration of psychological research on hallucinations. *Psychological Bulletin* 107(1):82–95.
- Burgess SM and van der Maas EM (eds.) 2002. *The new international dictionary of Pentecostal and Charismatic movements*. Grand Rapids: Zondervan.
- D'Aquili E and Newberg AB 1999. *The mystical mind: Probing the biology of religious experiences*. Minneapolis: Fortress Press.
- Giordano J and Engebretson J 2006. Neural and cognitive factors in spiritual experiences: bio-psycho social domains of effect relevant to clinical practice. *Explore* 2(3):187–196.
- Giovannoli J 2001. *The Biology of belief: How our biology biases our beliefs and perceptions*. Brooklyn: Rosetta Press.
- Gould SJ 1997. Nonoverlapping magisteria. *Natural History* 106:16–22.
- Griffiths RR, Richards WA, McCann U, and Jesse R 2006. Psilocybin can occasion mystical-type experiences having substantial and sustained personal meaning and spiritual significance. *Psychopharmacology* 187:268–83.

- Hagerty BB 2009. *Fingerprints of God: What science is learning about the brain and spiritual experience*. London: Penguin Books.
- MacLean KA, Johnson MW, and Griffiths RR 2011. Mystical experiences occasioned by the hallucinogen psilocybin lead to increases in the personality domain of openness. *J. Psychopharmacol* 25:1453–61.
- McNamara P 2009. *The neuroscience of religious experience 1st edition*. Cambridge: Cambridge University Press.
- Moll R 2014. *What your body knows about God: How we are designed to connect, serve and thrive*. Downers Grove: IVP.
- Newberg AB and Waldman MR 2006. *Why we believe what we believe: Uncovering our biological need for meaning, spirituality, and truth*. New York: Free Press.
- _____. 2010. *How God changes your brain: Breakthrough findings from a leading neuroscientist*. New York: Ballantine Books.
- Pannenberg W 1988. *Systematic theology 1*. Grand Rapids: Eerdmans.
- Pew Research 2011. Washington DC. www.pewresearch.org,01-05-2018.
- Plantinga A 2000. *Warranted Christian belief*. New York: Oxford University Press.
- Pretorius M and Lioy D 2012. *The Holy Spirit: A systemised study of the Spirit's person and work*. Johannesburg, RSA: South African Theological Seminary Press.
- Pretorius M 2016. Is consciousness a product of the brain or/and a divine act of God? Concise insights from neuroscience and Christian theology. *HTS Teologiese Studies/Theological Studies* 72(4), a3472.
- _____. 2017. A metaphysical and neuropsychological assessment of musical tones to affect the brain, relax the mind and heal the body. *Verbum et Ecclesia* 38(1):a1719.
- Thomas Aquinas 1912. *The Summa Theologica of St. Thomas Aquinas*. London: Burns Oates & Washbourne.
- Verghese A 2008. Spirituality and mental health'. *Indian Journal of Psychiatry* 50(4):233–237.
- Willard D 2002. *Renovation of the heart: Putting on the character of Christ*. Colorado Springs: NavPress.

Yong A (ed.) 2011. *The Spirit of creation: Modern science and divine action in the Pentecostal–Charismatic imagination*. Grand Rapids: Eerdmans.

Young RA 2000. The knowledge of God in Romans 1:18–23: Exegetical and theological reflections. *Journal of the Evangelical Theological Society* 43/4:695–707.