

# A Psychological and Neurological Study of Glossolalia

Harry Rockower

This project focuses on the intersection between Neuroscience, Psychology, and Religion within American Pentecostalism. Pentecostalism emphasizes personal religious experience that takes the shape of “Baptism of the Holy Spirit.” Pentecostals believe that the Holy Spirit dwells within the body and manifests itself in various ways. Glossolalia, or speaking in tongues, is one of the more prevalent examples of “Baptism of the Holy Spirit” within our society today. The goal of this project is to examine various theories that can help us better understand this phenomenon from a psychological and a neurological standpoint. To better understand glossolalia I attended services on several occasions at a local Pentecostal Church and interviewed a member who practices glossolalia.

## Psychological

Nearly 100 years ago, William James laid the foundation for the study of mystical states and religious experiences. His ideas were revolutionary at the time and many of them still prevail in the field and continue to foster new studies. In *The Varieties of Religious Experience*, James presents a pragmatic approach that analyzes religious states through the lens of personal experience. By adopting his view one can analyze and contrast normative consciousness with a variety of mystical states. James identifies mystical states not with a concrete definition but with four main criteria that may occur during the experience. The first of these is *Ineffability* which implies that this experience “defies

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expression” (329). One cannot explain or describe the experience completely and wholly to others who have not had a similar experience. It is phenomenologically distinct and unique for each person. Mystical states also contain what James calls a *noetic quality* by which he means that these experiences have epistemological significance and importance to the practitioner and carry a sense of authoritative knowledge. This knowledge becomes efficacious to the participant as new perspectives on the world transform past ideas and beliefs. The final two criteria are *transiency* and *passivity*. For most people, James argues, the mystical experience is one that is not infinite but lasts for a certain period of time. As well, those in a mystical state describe a feeling of being “grasped or held by a superior power” (330). This *passivity* may mean that the participant retains no recollection. While these four criteria elucidate a way to describe mystical and religious experience one must not, James indicates, overlook the phenomenological study of altered states of consciousness (ASC).

James posits that our normal or baseline conscious state is one of a multitude of states that are possible. This argument is broken down into two parts, the objective and the subjective. The objective is described as “the sum total of whatsoever at any given time we may be thinking of,” while the subjective is “the inner ‘state’ in which thinking has come to pass” (James, 428-9). The objective part represents all of the various stimuli and experiences that we take part in and are aware of. The subjective reflects these inner states and how these stimuli are internalized and processed. A participatory world is possible through this subjective state as our thoughts and actions become the center of our energy and consciousness. While this reflects our lived experience, James also discusses the idea of a field that is “extra marginal and outside of the primary conscious altogether” (207). The extra marginal field, or subconscious, becomes the vehicle by which various attributes stem from and serves as a possible explanation for various psychological tendencies.

James further discusses the idea that certain religious experiences take place through a dynamic process which differs from normal conscious functionality. Throughout our normal life, our mind is in a constant state of transformation. Our normal disposition is in a constantly changing state, but we regard these various transformations

as wholly normal. During an activity or experience, the resulting state “engrosses the interest, [as] all the ideas connected with other groups may be excluded from the mental field” (175). This shift is a “dynamic energy” whereby various interests are changed from “top to bottom” as new ideas manifest themselves from objective stimuli and push others away from the normative or subjective field into the subconscious (175-6). This process becomes reversed as various ideas and thoughts that were once latent shift to the forefront of consciousness. On certain occasions, for example, “religious ideas, previously peripheral in consciousness, now take a central place” (177). The conversion experience, which can be concomitant with a mystical experience, is one that originates from within the realm of consciousness. A shift in consciousness of this magnitude begins with the incubation and maturing of various ideas until a rapid transformation takes place and these ideas burst forward into the conscious field.

James uses the example of automatisms such as obsessive-compulsive disorder or hypochondriac feelings as an example of psychological tendencies that also originate not from outside stimuli but from subliminal areas of the mind. Those who undergo conversion experiences, such as Baptism of the Holy Spirit, may show similar qualities to these automatisms. These subjects are “in possession of a large region in which mental work can go on subliminally, and from which invasive experience, abruptly upsetting the equilibrium of primary consciousness, may come” (210). But James also emphasizes that nervous instability, rather than divine inspiration produces these psychological disorders. Although it may seem as though he simply reduces religious experience to the status of psychological phenomena, he does seek to reconcile his theory with the possibility of a higher control. The subconscious region of our mind, he posits, may be the vehicle by which a divine being manifests itself.

## **Neurological**

More recent research has narrowed the gap between religion and science. Developing the theories of James, neuropsychologist Warren Brown emphasizes how “religious and spiritual experiences, like all other human experiences, are grounded in neural processes” (92). In his book *Neuroscience, Psychology, and Religion*, Brown provides a detailed explanation of brain function and human consciousness that may help

to explain glossolalia. Brown posits a theory regarding neural processes and consciousness called dynamic core theory. Dynamic core theory defines consciousness as a “temporary and dynamically changing process within the cerebral cortex that is characterized by a high degree of functional interconnectedness among widespread areas” (51). This involves non-localized brain function that exhibits two different types of activity: conscious and unconscious. In the unconscious state, the “lower brain (brain stem and midbrain)” controls automatic processes while the conscious state is a product of the “upper brain (cerebral cortex)” (51). This dualistic process creates a hierarchical organization of thoughts and actions. Such organization is made possible, Brown explains, by the plasticity within neurons and synapses. Different actions or thoughts are experienced initially in the conscious state and then ultimately are integrated within the hierarchy of the subconscious. The reverse of this process may be the conversion experience that James’ describes. Although the “organization of the cerebral cortex is influenced (or predisposed) by genetics” it is also shaped and “formed by experiences within the world” (49). One may be predisposed to speaking in tongues, but the process itself may be a learned process that must first become embedded within our subconscious and then given the opportunity to “erupt.”

Many theorists posit that religious experiences, including glossolalia, stem from a shift from baseline consciousness to an altered state of consciousness. In a study of glossolalia, Felicitas Goodman presents the theory that glossolalia “always involves a change of mental state similar to trance” (qtd. in Maloney 100-1). Goodman analyzed four different instances in which speaking in tongues occurred. According to her, in each case the “individual switched off cortical control in response to rhythmic activity (prayer or singing)” (qtd. in Maloney 102). Brain functions that are not associated with normal consciousness take a primary role. By using an electroencephalograph (EEG), Dubois has measured brain waves during a religious experience or trance state demonstrating that those produced during a trance state are lower frequency alpha waves, which are also produced during sleep (114). He describes this shift in consciousness as the collapse of the sympathetic nervous system which allows the parasympathetic nervous system to take control. This type of activity within the brain creates a “kindling

effect” which makes “the brain’s resistance to it lessens in the future... [as] it becomes progressively easier... to fall into trance” (113). Since all actions are grounded in neural processes, a religious act such as speaking in tongues may be a learned process and stored within the hierarchy of brain function like normal everyday activities.

Modern brain imaging has been used to illustrate the various brain structures that become active during religious experiences. Some brain states that are associated with those felt by a religious practitioner have been reproduced by transcranial magnetic stimulation. This method stimulates various areas of the brain with an electrical signal and those who received a “stimulation of the right temporal lobe resulted in the person’s reporting a ‘sense of presence’” (95). Many researchers extrapolate from this data the idea that there must be a “God Spot” because these experiences stem from a specific area in the brain. However, by applying the dynamic core theory, one could argue that there can be no “God Spot” because brain function is a constantly shifting, adaptive and emergent process. Many different parts of the brain, including the parietal lobe and temporal, have been identified as being active during religious experiences.

A study by Andrew Newberg examined the brain state of a participant while she was speaking in tongues. This participant practiced glossolalia alone while in a laboratory setting that used a non-invasive procedure to measure her brain states. His data showed that “the frontal lobes showed decreased perfusion during glossolalia... consistent with subjects’ description of a lack of intentional control over the performance of glossolalia” (70). This data provides a physiological reason that can be reconciled with a participant’s lived experience. The loss of control that is associated with a divine spirit is manifested through this type of brain activity. As James also suggests, this brain activity could be initiated by subconscious activity. While this may give an explanation of the lived experience, it does not negate the idea of a divine aspect because it does not signify causality. In a different study Shulka and Pattison posited that glossolalia disrupts “the psychobiological pathway of normal speech” (qtd. in Maloney 114). The normal speech process becomes interrupted as the temporal lobe becomes excited and initiates speech without any normal stimulus or idea. Speaking in tongues is incomprehensible because areas of

the brain that are normally active during speech no longer govern the process.

Another example of brain activity that is often aligned with religious experience is epilepsy. Before going into a seizure, some epileptic patients describe being in a state of spiritual intensity. Others, though, do not report having a religious experience accompanying their seizures. This difference suggests that religious experiences are largely dictated by past learned experiences as well as by situational contexts. Maloney describes this idea in further detail by explaining how “all our choices are determined by the culture in which we are raised and even when we select one alternative over another we do so within the range of options available in our society” (110). Religious experiences function on a physiological level but ultimately are influenced by the social and cultural setting.

### **Pentecostalism**

The turn of the 20<sup>th</sup> century gave rise to what is now the largest Protestant Christian denomination in the world: Pentecostalism. Pentecostalism gained popularity from its emphasis on personal experience. This experience came in the form of “Baptism of the Holy Spirit” and is manifested through various actions such as divine healing and speaking in tongues. Glossolalia or tongues, is an accessible topic with numerous contemporary practitioners who trace the experience back to the book of Acts in the New Testament. According to Burgess, “speaking in tongues unknown to the speaker is the necessary first sign that one has received the Pentecostal experience” (220). This experience proceeds through two stages, the “sign” and the “gift.” The sign takes place when the Holy Spirit fills the body, which is available to every single person. While there are many different gifts of the spirit such as divine healing or prophecy, glossolalia signifies that the Holy Spirit has entered the body and is working through the practitioner.

In a synthesis of firsthand accounts of glossolalia, Grant Wacker highlights various commonalities between the practitioners. The first similarity is that all who have experienced glossolalia believed in the truth of the experience prior to it occurring. Second, many who were firm believers in these practices and doctrines were not successful in their attempts to receive the gifts of the spirit. In many cases, the laying on of hands facilitated the glossolalic experience and the experience

almost always “took place in a setting where others were seeking and receiving the baptism” (38). Wacker also describes common physical sensations that occur during the experience. These include a self reported feeling of an electric shock, fire, heat or hot coals, various liquid similes, and muscle spasms. Less common experiences associated with tongues include *xenolalia* when practitioners speak another language of which they have no actual knowledge and *cryptomnesia*, when they “vocalize portions of a language they had casually encountered” (47). These phenomena are highly controversial and exceedingly harder to prove.

Wacker also offers a social science perspective for the physiological mechanism by which glossolalia works. This process, called dissociation, occurs when “the higher speech control center in the cerebral cortex of the brain is cut off from the lower motor control center in the medulla” (52). Dissociation, which is similar to Goodman’s altered state theory, results in various noises and sounds that are not identifiable as normal language.

### **Ethnography**

For this project, I attended services at a Pentecostal Church (PC) for three consecutive Sunday services. The congregation of PC is interracial, roughly 75% black and 25% white. Ages vary, spanning from young children to the elderly. As one walks into the sanctuary, there are rows of pews on the left, center, and right separated by two aisles. On the back of the pews are Bibles for the congregants, but there were very few of them throughout room. From the front rows to the stage there is roughly 10 feet as well as a balcony in the back with more seats, electrical equipment, and a video camera to record the service. On the walls on either side are flags of various countries signifying that PC believes that its message should be spread throughout the whole world. There are four steps leading up to the raised stage. A podium with a cross on it appears at the front: it appears to be the only cross in the entire sanctuary. There do not appear to be any images of Jesus anywhere in the sanctuary. The choir sits on the left and right hand sides behind the podium with approximately 10 people on each side. On the stage directly behind the podium, people play drums, keyboard, and bass guitar. Partially hidden from view at the far back of the stage is a baptismal font. There are giant projector screens above the stage

on either side which broadcast the words to various songs as well as various talking points throughout the sermon. The congregants dress in a range of attire from jeans and t-shirts to full suits as the Church encourages the congregation to wear whatever they deem fitting for the service.

During the three times that I attended, I observed a pattern within the structure of the service but the prayers changed from week to week. The service started with various people clapping, throwing their hands up to in the air exclaiming praises, or coming to the front of the room and putting their head on benches that were right below the stage. After a couple minutes had elapsed, the choir came out and began singing various gospel songs accompanied by the band. The lyrics to these songs were put up on the screen so that the congregation could follow along. The songs had very few different words in them and repeated the same phrases such as “God is good,” “Hallelujah,” and “Praise is what I do.” During these songs there was a tremendous amount of enthusiasm in the room and each time that I was there I observed a man in his mid-fifties in the row in front of me dancing with the same passion and energy as if he were in a club. The majority of the congregation sang along and/or participated in some way.

After about 20-25 minutes of singing, the Pastor, a white male of 50 or so dressed in a three piece suit, would come out and begin to take an active role. With the music still playing in the background, the Pastor would ask the congregation “who’s ready to be healed?” and then attempt to increase the enthusiasm by saying he didn’t feel enough energy in the room. The choir and band would continue to play as many people started to put their hands up in the air and scream “Praise Jesus” or “Thank you Jesus.” During this time many people begin to speak in tongues. The noises that I heard were incomprehensible and I could not discern any specific pattern or the suggestion of a known language. Many different people around me were speaking in tongues and this was manifested in a variety of ways. Some people stayed in their pews while others began to run in front of the stage or congregate in the corner. At that point, the Pastor would then encourage people to get out of the aisles and come collectively pray in front of the stage while the music continued to play softly in the background.

As he talked, the Pastor would shift back and forth between speaking



in tongues and English. I believe that this is a different experience from those in the audience because the Pastor was leading the service and seemed to be completely conscious of what he was doing. His eyes were open and he was giving directions to the congregation as he seemed to be facilitating the experience for others rather than cultivating it for himself. As many of the congregants came to the front, the glossolalia became communal. Congregants would lay hands on the foreheads of other members and begin to chant in tongues and pray while in constant contact with each other. During or after speaking in tongues, many people began to cry, or shake, or fall to the floor.

Of the many people that I witnessed having this experience there were two individuals that I observed in great detail. The subjects were located directly next to me and in front of me. The first was an African American woman in her mid 30s who began to speak in tongues. As this woman was praying, she had her hands in the air, closed her eyes, and began to shake. She then began to speak in tongues, uttering incomprehensible noises. During this time, which lasted about 5 minutes, she appeared in anguish and was crying. She looked as if she was in a constant dialogue the whole time. As she emerged from the experience she began speaking in English again to the man next to her. The other subject was an African American woman in her mid 30s who sat two rows in front of me. This woman began to convulse violently and began shaking up and down. While she was shaking uncontrollably the women around her began comforting her by patting her back and encouraging her. One woman brought over a box of tissues and began to wipe the sweat off of her face. They then put the box of tissues in front of her mouth, as it looked like she was vomiting. I was behind her so my view was partially blocked, but she seemed to be coughing or vomiting into the box. After roughly five to ten minutes or so, the women returned to normal consciousness and the women around her began to congratulate and hug her. She had a look of satisfaction, relief, and joy after this experience had concluded.

### **Case Study**

To understand this phenomenon more clearly, I interviewed an older member of the church for his views on speaking in tongues. The man I interviewed, whom I will call C, is an African American man in

his early to mid 60's and was first baptized in the Holy Spirit 36 years ago. He described himself as running wild through the streets of New York before being baptized by the spirit. C spoke seven different languages (tongues being his eighth), was very articulate, and seemed well respected in the church community. I did not witness him speak tongues but I watched him lay hands on someone else who had begun to speak tongues for the first time.

The interview with C reaffirmed the conclusion that speaking in tongues is a learned experience. I asked C if it was possible that someone who had never gone to church, never heard of God or Pentecostalism, would be able to speak in tongues. C responded that this ability is innate, that "you were born with that ability," but that there is nonetheless a process one typically followed: "Repentance, Baptism, Holy Ghost." Dynamical core theory can account for this; as Brown argues, our thoughts and actions are influenced by genetics but shaped by our experiences in the world. Because of this, speaking in tongues could be a genetic trait that must be learned in order to be manifested. As well, this could explain Wacker's description of some practitioners who never were able to speak in tongues albeit trying because they did not possess the correct genetic traits.

During the service, singing and praise worship play an integral part in the tongues experience, apparently helping to facilitate the process. C describes how "in the beginning of the service, you sing songs because the Bible says praise him." Each service that I attended began with communal singing and the speaking in tongues that I witnessed occurred only when accompanied by music and singing. As Goodman claims, praying and singing helps to facilitate the switching off of cortical control. The music and singing serves as a catalyst for the shift that takes places into speaking in tongues.

As C describes it, speaking in tongues is a transitional process that reflects a shift in consciousness. As a person begins to speak in tongues, C observes, one can "recognize and know this because you'll notice they say the words hallelujah, the words hallelujah start messing up." This could be the initial step in a loss of cortical control that activates different centers of the brain which affect speech as explained by Shulka and Pattison. C represents the process as a "quick transition" in which the spirit begins to control your tongue and "God

is taking over and letting you make that transition.” C describes how one must cross a threshold and then “Boom! You receive the gifts.” The notion of crossing this threshold recalls the conversion process that James describes.

The individuals that I witnessed speaking in tongue returned to normal states after five minutes or so, which highlights the trait that mystical experiences are, according to James, *transient*. C mentioned multiple times that the experience was analogous to flowing water and that once you receive the gifts “it’s like bubbling water, you can’t sit still.” C also stated that following the experience “you feel like you just drank a quart of scotch.” While many of the theories discuss various changes within the brain or common physical traits, C highlights a feeling of intoxication as another byproduct of the tongues experience.

During the speaking in tongues experience, new ideas come forward from the subconscious which change and shape a person’s normal disposition. C explains, “I don’t know what happens inside of your body, but it is that transition that takes place where that person actually feels that, ‘Wow, there is a change.’” This change is something that may be made possible by the shift into an altered state that differs from the normal transformations of our consciousness. Speaking in tongues can occur more easily after the first time as “you receive the Holy Ghost one time” after which “whenever the gifts are ready to be used by the lord” they will come out of you. This reflects the idea of “kindling” posited by Dubois, in which the brain’s resistance to such events lessens each time. Speaking in tongues gradually becomes a “nearly automatic, response to certain ritual behaviors, such as singing [or] dancing” (113).

## **Conclusion**

My research has encouraged me to understand the experience of glossolalia as an individual process that unfolds within a religious and communal event. By entering an altered state of consciousness, the participant brings forth perceptions that would otherwise remain latent or subconscious. In the phase prior to the experience, the individual is active within the church setting. Either by participating in song or engaging in private prayer, the individual gives him or herself over to a Pentecostal service and the religious framework and perspective lens of that church. The participant retains free choice, as Maloney

states, but only within the set of boundaries of the social group to which he or she belongs. As the Baptism of the Holy Spirit occurs, the participant shifts into an altered state of consciousness in which different centers of the brain become more active. As one shifts into this altered state, the dynamical core, described by Brown, adapts to the new information and inverts the hierarchical order of consciousness. Ideas that were once latent have now “erupted” forward as various learned thoughts become the new “habitual centre of energy,” and the person undergoes something similar to James’ explanation of conversion. Normal speech becomes inhibited, as Wacker and Shulka and Pattison indicate, and the mechanism for speech becomes rooted in the subconscious.

The lasting effects of the experience are also in direct correlation to the experience itself. I believe that the altered state of consciousness creates a measurable change on a neurological level that can affect personality and disposition. As the participant reverts back to regular consciousness the feeling of a “presence” is real to that person because there is a change on the chemical level, as Brown suggests. A noetic state, or state of knowledge, may be possible because of changes in brain chemistry as well as social conditioning. The participant comes out of the ASC expecting to be a changed person. James describes best how neuroscience, psychology, and religion can all coexist as the subconscious could be the pathway through which divine causality takes place and speaking in tongues originates.

While the theories above may partly explain the phenomena of speaking in tongues, there are still features of the experience that require further research. Even with our current neuroimaging technology, there is also no way to monitor a person’s brain states when he or she is speaking in tongues in a church service. I believe the best way to understand this phenomenon will be to measure brain states in a community setting. As well, more research can be done on the physiological effects of speaking in tongues. Various studies could be done analyzing both personal disposition and brain function before and after the experience take place. More detailed studies of the subconscious and conscious could be used to better understand the physiological aspects of speaking in tongues.

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