

# Speaking in Tongues: Glossolalia and Stress Reduction

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In Topeka, Kansas, on New Year's Day, 1901, a Bethel Bible College student named Agnes Ozman began making sounds “that were not discernible as normal language to the others present.” A few years later, William J. Seymour exhibited the same behavior in Los Angeles, becoming the centerpiece of the well-known 1905 Azusa Street Revival—an event that helped launch the modern Pentecostal movement.

At the heart of the Pentecostal experience is the act of speaking in tongues, known as glossolalia. What goes on in the brain of people engaging in this unusual form of utterance? Recent neurobiological research has shown that glossolalia may be a more directed activity than previously believed, and may play a direct role in defusing stress reactions.

In 1972, anthropologist Felicitas Goodman engaged in a long-term [study](#) of glossolalia among English and Spanish-speaking Pentecostal communities in the U.S. and Mexico. She views glossolalia as an induced trance that manifested as a “dissociative hyper-arousal state,” with similar features across time and cultures. Other researchers have described instances of glossolalia among Inuit populations in the Arctic, in rituals of the Saami of Finland, and during certain possession states achieved in Haitian voodoo—although the extent to which it occurs outside of religious contexts remains unclear.

In 2006, glossolalia rekindled the interest of researchers after neuroscientist Andrew Newberg and associates at the University of Pennsylvania School of Medicine [recorded](#) single-photon emission computerized tomography (SPECT) scans of active glossolalists (hymn singers were used as controls). Unlike people engaged in “attention-focusing tasks” like mindful meditation, people speaking in tongues while being scanned showed decreased cerebral blood flow activity in the prefrontal cortices. “Glossolalia brain function appears to be more similar to other trance-like states in which the frontal lobe activity diminishes as the person loses their sense of purposely performing the practice,” said Newberg, in an interview for this article. “In some sense, it is the opposite of the concentrative process of meditation.”

Under closer observation, glossolalic utterances are beginning to look more like goal-directed actions, and less like involuntary outbursts. In the Newberg study, subjects claimed to have no control over their speech patterns during an episode of glossolalia, but they were able to begin tongue speaking more or less on demand while being scanned. “It seems to be something that someone can ready themselves to do, but once they are fully into it, they experience being ‘taken over’ by it,” Newberg said. “The people we studied certainly were not in their usual state of consciousness and required some effort to stop them from the practice. They also seemed to require several minutes before ‘coming back’ to their usual state.”

As one glossolalist [explained](#): “When I am speaking in tongues, I generally do not exercise control over the syllables that I am speaking; however, at all times I have full control over the pitch, volume, clarity of pronunciation, whether to cease or pause, etc.”

## **Glossolalia and Dissociation**

If glossolalia is partly voluntary, but does not affect the brain like concentrative meditation, then what, exactly, does it do? In a 2011 [report](#) in the *American Journal of Human Biology*, biological anthropologist Christopher Lynn and coworkers at the University of Albany (SUNY) defined glossolalia as “an embodied pattern of religious behavior with biological outcomes,” and tentatively demonstrated that one of those outcomes may be the reduction of biological stress.

Lynn’s team found that glossolalia was associated with both a reduction in circulatory cortisol, and enhancements in alpha-amylase enzyme activity—two common biomarkers of stress reduction that can be measured in saliva. Cortisol is a stress hormone responsible for the familiar stress response known as the fight-or-flight reaction. Alpha-amylase is an arousal enzyme that is sensitive to quick environmental changes and involves adrenaline release in the sympathetic nervous system.

Lynn’s [study](#) of 52 Pentecostals in New York’s Hudson Valley found that the experience of glossolalia dampened reactions to normal daily stressors. “I was comparing both biomarkers on Sunday and Monday because I wanted to see if people with more glossolalia experience would have less reactive nervous systems, as though their experience had caused them to be less anxious people in the face of stress, as meditation is reputed to do,” Lynn said. On Sunday, Lynn found that cortisol levels were high for all churchgoers in the study, as expected. “On Monday,” Lynn said, “I predicted people with more glossolalia experience would have lower cortisol, which they generally did. Amylase is a little more difficult to interpret, but the higher rate of amylase among those with more glossolalia experience on Monday is interpreted as greater stability.”

Lynn thinks glossolalia is best viewed as a dissociative state of consciousness. “Dissociation is the psychological state wherein areas of conscious awareness are

partitioned from each other,” he said. From the outside, observers often describe this as a trance. “This is consistent with Pentecostal reports that their awareness and memories of their tongues experiences range from absent to hazy,” Lynn said. “In the brain, this is what Newberg and others call ‘deafferentation.’ Afferent neural signals are those coming into an area, often sensory systems, so awareness of the environment and/or proprioception [self in space] are not coming through the executive areas in the prefrontal cortices and parietal areas to some degree. This is consistent with Newberg’s SPECT study of glossolalia.”

As for the difference between glossolalia and meditation, Lynn comments: “Different types of altered states of consciousness invoke different brain networks and association areas.”

But where does the “self” go during glossolalia? Dissociation, various forms of which may reduce stress, is defined as the splitting off of certain mental processes from the main body of consciousness. The common quality is automaticity, the experience of the activity being performed by itself. Dissociation ranges from mild detachment, such as missing a turn while driving because your mind was somewhere else, to extreme cases suggesting multiple personality disorder. “I have been looking at dissociation with regard to sitting in front of fires,” Lynn said, “suggesting that the relaxation response such states inculcate are beneficial individually and socially.” Another form of dissociation, Lynn suggested, is self-deception, which he defined as “a partitioning of consciousness to generally enhance oneself in the face of contrary evidence.”

As for glossolalia, Lynn notes that religion has been referred to as a “‘superstimulator,’ exploiting numerous basic cognitive mechanisms in a synergistic way.”

Is everybody capable of learning to speak in tongues? Are some people more prone to glossolalia than others? And why do some Pentecostals never speak in tongues at all? Earlier research had suggested a greater occurrence of dependency syndromes [belief that a group can not solve its own problems without outside help] among tongue speakers. But Lynn and others theorize that a proclivity for glossolalia may involve variability in dopaminergic genes believed to also mediate [susceptibility to hypnosis](#).