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A Neuroscientific Look at Speaking in Tongues

By Benedict Carey

The passionate, sometimes rhythmic, language-like patter that pours forth from religious people who “speak in tongues” reflects a state of mental possession, many of them say. Now they have some neuroscience to back them up.

Researchers at the University of Pennsylvania took brain images of five women while they spoke in tongues and found that their frontal lobes — the thinking, willful part of the brain through which people control what they do — were relatively quiet, as were the language centers. The regions involved in maintaining self-consciousness were active. The women were not in blind trances, and it was unclear which region was driving the behavior.

Evidence for a Religious State

Scientists found notable changes in brain activity when people speak in tongues. The brain scans below show blood flow in the brain (blue lowest, red highest).

[Images of brain scans showing increased activity in certain regions]

The images, appearing in the current issue of the journal Psychiatry Research: Neuroimaging, pinpoint the most active areas of the brain. The images are the first of their kind taken during this spoken religious practice, which has roots in the Old and New Testaments and in charismatic churches established in the United States around the turn of the 19th century. The women in the study were healthy, active churchgoers.
“The amazing thing was how the images supported people’s interpretation of what was happening,” said Dr. Andrew B. Newberg, leader of the study team, which included Donna Morgan, Nancy Wintering and Mark Waldman. “The way they describe it, and what they believe, is that God is talking through them,” he said.

Dr. Newberg is also a co-author of “Why We Believe What We Believe.”

In the study, the researchers used imaging techniques to track changes in blood flow in each woman’s brain in two conditions, once as she sang a gospel song and again while speaking in tongues. By comparing the patterns created by these two emotional, devotional activities, the researchers could pinpoint blood-flow peaks and valleys unique to speaking in tongues.

Ms. Morgan, a co-author of the study, was also a research subject. She is a born-again Christian who says she considers the ability to speak in tongues a gift. “You’re aware of your surroundings,” she said. “You’re not really out of control. But you have no control over what’s happening. You’re just flowing. You’re in a realm of peace and comfort, and it’s a fantastic feeling.”

Contrary to what may be a common perception, studies suggest that people who speak in tongues rarely suffer from mental problems. A recent study of nearly 1,000 evangelical Christians in England found that those who engaged in the practice were more emotionally stable than those who did not. Researchers have identified at least two forms of the practice, one ecstatic and frenzied, the other subdued and nearly silent.

The new findings contrasted sharply with images taken of other spiritually inspired mental states like meditation, which is often a highly focused mental exercise, activating the frontal lobes.

The scans also showed a dip in the activity of a region called the left caudate. “The findings from the frontal lobes are very clear, and make sense, but the caudate is usually active when you have positive affect, pleasure, positive emotions,” said Dr. James A. Coan, a psychologist at the University of Virginia. “So it’s not so clear what that finding says” about speaking in tongues.

The caudate area is also involved in motor and emotional control, Dr. Newberg said, so it may be that practitioners, while mindful of their circumstances, nonetheless cede some control over their bodies and emotions.