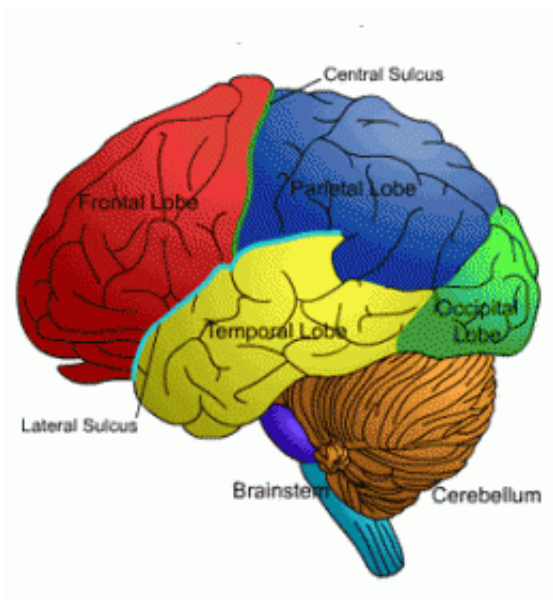


# Religious factors may influence changes in the brain

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Brain diagram. Credit: dwp.gov.uk

(Medical Xpress) -- Researchers at Duke University Medical Center have found an apparent correlation between religious practices and changes in the brains of older adults.

They measured changes in the volume of the hippocampus, an area of the [brain](#) involved in [learning and memory](#). All human brains tend to shrink with age, with different [brain regions](#) shrinking at different rates. Shrinkage (atrophy) in the hippocampus has been linked with depression

and Alzheimer's disease.

The researchers found that Protestants who did not identify themselves as born-again had less atrophy in the hippocampus region than did born-again Protestants, Catholics, or those having no [religious affiliation](#). Study participants who reported having had a religious experience that changed their life were also found to have more atrophy in the hippocampus than those who did not.

The study measured relationships between religious factors and changes in the volume of the hippocampus over time in older adults. In standardized interviews, 268 people aged 58-84 were asked about their religious group, spiritual practices, and life-changing religious experiences. Changes in the volume of their hippocampus were then tracked, using MRI scans, over a period of 2-8 years.

The study was published recently in [PLoS ONE](#) (Public Library of Science ONE), an open-access science journal.

Authors Amy Owen, Ph.D., and David Hayward, Ph.D., research associates at Duke University Medical Center, said these findings were not explained by other factors related to hippocampal atrophy, such as age, education, social support from friends and family, being depressed, or [brain size](#). In addition, other religious factors (such as prayer, meditation, or Bible study) did not predict changes in the volume of the hippocampus in this study.

The authors speculate that stress might play a role in their findings.

"One interpretation of our finding -- that members of majority religious groups seem to have less atrophy compared with minority religious groups -- is that when you feel your beliefs and values are somewhat at odds with those of society as a whole, it may contribute to long-term

stress that could have implications for the brain," said Owen, who was lead author of the study.

"Other studies have led us to think that whether a new experience you consider spiritual is interpreted as comforting or stressful may depend on whether or not it fits in with your existing religious beliefs and those of the people around you," Hayward said. "Especially for older adults, these unexpected new experiences may lead to doubts about long-held religious beliefs, or to disagreements with friends and family.

"Several studies have found that, for many people, belonging to a religious group seems to be related to better health in later life, but not all religious people experience the same benefits. This study may help us to understand some of the reasons for those differences," Hayward said.

While this stress may be a plausible interpretation of the findings of this study, the authors caution that not enough detail is known about the mechanics of how stress affects brain atrophy.

This study is among the first to examine religious and spiritual links to changes in volume of specific areas in the brain, and is the first to explore religious factors such as life-changing religious experiences. Rather than suggesting that particular religious experiences or groups should be avoided or promoted, the emphasis of this study was to help clarify possible relationships between religion and the brain.

Learning which factors are associated with hippocampal atrophy is valuable, as previous research has established that smaller hippocampal volumes are related to health outcomes such as depression, dementia, and Alzheimer's disease in older adulthood.

Provided by Duke University

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