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## More Education Delays Dementia Signs--But Not Damage

**A new study of hundreds of human brains helps to explain why education seems to help stave off dementia**

By Katherine Harmon

Education has been linked to decreased risk for dementia for decades, but researchers behind a new study opened up the brains of hundreds of people who had died with the disease to try to find out why this correlation exists.

The scientists found that the number of years a person had spent in school early in life did not change the amount of damage to the brain from dementia.

Most of the previous studies describing the [link between education and risk for dementia](#) were purely observational—a method in which "you can't really prove a cause and effect," says [P. Murali Doraiswamy](#), head of biological psychiatry at Duke University and who was not involved in the new research. He also notes that many of the cognitive tests to diagnose dementia are biased against those who have lower levels of verbal and reasoning abilities due to less education to begin with.



"If low education is truly associated with dementia then you would see a higher pathology in the brain," Doraiswamy says. And that is not what the researchers behind the new study found. The work is described in a paper published online July 26 in [Brain](#).

The findings indicate that a person's education in early life does not have much impact on how much physical damage dementia seems to do to the brain. Those who had the fewest years of formal education had "increased vulnerability to cognitive deterioration," the researchers noted in the study, making them less able to cope with slipping mental function.

But the conclusions do not indicate that the more learned are immune to the degenerative condition. A number of well-educated scientific minds, such as Charles Kao whose 1960s work on fiber optics won him the 2009 Nobel Prize in Physics, have fallen prey to Alzheimer's disease.

The researchers analyzed survey data and interviews from three large cohort studies in the U.K. and Finland in which subjects were followed for up to two decades. And 872 people in the studies donated their brains for postmortem analysis (some 56 percent of whom showed some signs of dementia before death). Most of those who died during the studies had finished their formal education more than 70 years before death—an association that the authors of the new paper described as "remarkable."

The years of education ranged from zero through postgraduate degrees. Subjects who hailed from the U.K. had had a nine-year mandatory school minimum at the time when subjects were growing up, but those from Finland tended to have far fewer, which was "quite informative because there was no mandatory education [there] at the time," says [Hannah Keage](#), a researcher at the University of Cambridge's department of neuroscience and a co-author of the new study.

### Education for a healthier brain?

As the number of people projected to be diagnosed with Alzheimer's disease grows by the decade, researchers struggle to tease apart the possible confounding variables to find clearer understandings of risk. Everything from diet to [exercise](#) to a [word-puzzle habit](#) have been purported to help reduce the risk of dementia, but many of these lifestyle issues are also intimately linked to education.

"There's a really big hypothesis that those with less formal education led a less healthy lifestyle," Keage says, "but we didn't really find that at all." Many studies have pointed to a greater risk for cardiovascular disease in lower socioeconomic classes (in which people are also likely to have fewer total years of education). But the brain dissections showed that vascular damage, which has been linked to dementia, did not correlate with the amount of formal education a person had had in their younger years.

The researchers did find that on average, those with additional years of formal education had heavier brains at the time of death.

"We can't tell if it's education leading to greater brain weight," Keage says. "It may be that those with larger brains are more predisposed to taking more education." As she and her colleagues discuss in the study, the more substantial heft might be due to an increased number of synapses as a result of education—and a more stimulating, healthier mental life thereafter.

Researchers are still on the hunt to figure out just what role early-life education has on later-life cognitive performance. "Is it truly a cause and effect, or is it a marker for something else?" Doraiswamy asks of education. Education, he suggests, could be a marker for something as distant as prenatal nutrition, as mothers who do not get the proper nutrition while pregnant often give birth to children with smaller brains.

### Improving odds

Although [no cure exists for Alzheimer's](#) or other forms of dementia, some research results have suggested slight benefits if dementia is [diagnosed early](#). As such, does this mean that a more educated person, who might not show signs of decline as early on as someone less learned, would be at a disadvantage?

Not necessarily, Keage says. "Those with higher education are more likely to seek services" and diagnosis if they start to feel they are slipping. She adds that "those with a higher education do have a sharper trajectory [of decline] to death."

But for most the news that formal education early in life might help [delay some of the symptoms of dementia](#) comes decades too late. "People past their education age seemed to be disappointed by the results," Keage says. She emphasizes, however, that education seems to be "just one more factor that can modify your dementia risk." Doraiswamy says it likely plays a small role and is probably less important than genetics as well as a host of health and lifestyle factors that are only starting to be parsed out.

"There's probably still some neuroplasticity left in the brain during adulthood," Doraiswamy notes. He suggests more studies of the impact of midlife and late-life [hobbies](#) and occupations to see what patterns education duration plays throughout life—and what those long past their campus days can do to improve their odds.

For now, research suggests a healthy diet, exercise and social engagement as likely to help stave off the dreaded condition. So if you did not go in for a PhD, Keage says, "I don't think it's time to give up yet."

### Further Reading

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[Self-Fulfilling Fakery: Feigning Mental Illness Is a Form of Self-Deception](#)

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