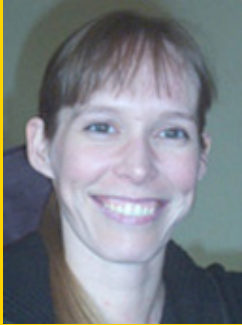


# The Memory Practice Newsletter

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In this issue Dr. Michelon tells you about Education and Cognitive Reserve.

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## More Education = More Cognitive Reserve.

What is cognitive (or brain) reserve?

The cognitive reserve hypothesis states that individuals with more cognitive reserve can experience more Alzheimer's disease pathology in the brain (more plaques and tangles) without becoming demented.

### A recent study.

In a 2008 study, Roe and colleagues from Washington University in St. Louis, used the number of years of education as a measure of cognitive reserve.

Why years of education? Because previous studies have shown that people who have more education also exhibit a greater resistance to Alzheimer's symptoms, even while pathological changes are occurring in the brain.

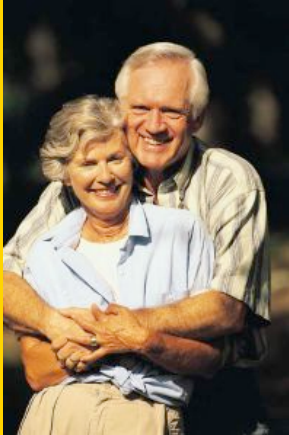
Roe and her colleagues studied 198 individuals whose mean age was 67. Out of these 198 individuals, 161 were non-demented and 37 were diagnosed with Alzheimer's Disease.

All the participants in the study took a 1.5h battery of tests to evaluate their cognitive functioning.

They also underwent a PiB PET scan. This brain-imaging technique uses a marker called carbon 11-labeled Pittsburgh Compound B (PiB). The marker binds to beta-amyloid plaques in the brain and can be seen on a positron emission tomography (PET) scan. Statistical tests were used to assess how the number of plaques in the brain, clinical and behavioral measures, and cognitive reserve interacted.

### Results

For participants who had a large amount of plaques in the brain, performance on several cognitive tests increased with increasing education. This relationship was not observed for individuals with a lower amount of plaques in the brain.



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This means that individuals with greater education maintain better cognitive functioning in the presence of Alzheimer's Disease pathology.

## **Conclusions**

This new study confirms the idea that cognitive reserve (here measured in terms of years of education) influences the relationship between cognitive functioning and amount of Alzheimer's pathology.

It also raises several questions:

### **How many years of education does one need to be "protected"?**

In the studies published so far individuals with high levels of education were individuals who had 15 years or more of education. Little is known about the effect of lower levels of education.

### **Are years of education the only measure of cognitive reserve?**

No. Other indicators include a challenging occupation, engaging hobbies and active social networks. As you can guess, years of education are easier to objectively measure, which may explain why they are used more often in studies of cognitive reserve.

### **Does it mean that if one doesn't have a high education level, it is too late, there is nothing that one can do?**

No! As described above, cognitive reserve can be measured in other ways. This means that people who are not highly educated but live a stimulating life and are active socially can still get some neuroprotection.

## **References**

Roe, C. M., Mintun, M. A., D'Angelo, G., Xiong, C., Grant, E. A., Morris, J. C. (2008). Alzheimer Disease and Cognitive Reserve. Variation of Education Effect With Carbon 11-Labeled Pittsburgh Compound B Uptake. *Arch Neurol.*, 65(11), 1467-1471.