NACC Project #2005-JI-03 (Secondary Analysis of NACC data)
“Education, The Cognitive Reserve Hypothesis, and Alzheimer’s Disease Without Dementia”

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Project Description
Some clinically-assessed individuals will not receive a diagnosis of dementia during life, but will meet neuropathologic criteria for Alzheimer’s disease (AD). The presence of high plaque and tangle counts at autopsy among nondemented participants has led some researchers to propose that individuals with a neuropathological diagnosis of AD and with no cognitive impairment during life, may be those with presymptomatic or unrecognized early symptomatic AD. The Cognitive Reserve Hypothesis suggests that individuals with greater amounts of education will be better able to cope with brain pathology, showing fewer dementia symptoms at a particular level of AD neuropathology. Therefore, individuals with more formal education might be expected to make up a greater proportion of the subsample of individuals who meet neuropathological criteria for AD, but do not receive a dementia diagnosis during life. The National Alzheimer’s Coordinating Center (NACC) maintains a database that receives clinical (Minimum Data Set [MDS]) and neuropathologic (Neuropathology Data Set) data on an ongoing basis for participants enrolled in the 32 Alzheimer Disease Centers nationwide. The proposed study will examine the role of education in presymptomatic AD within the framework of the Cognitive Reserve hypothesis, using data from the NACC MDS and Neuropathology datasets, along with data from a NACC collaborative study which examined AD neuropathology among nondemented older adults. The specific hypotheses to be tested are: (1) among participants who are judged to be nondemented at the last assessment prior to death, AD-related neuropathology will be more advanced in individuals with greater amounts of education, and (2) among participants with neuropathologic diagnoses of AD, individuals with greater education will be more likely to be found nondemented at the last assessment prior to death. If results indicate that educational level mediates the relationship between AD pathology and dementia, and that education is related to receiving a neuropathological diagnosis of AD without a corresponding clinical diagnosis of dementia, these findings would support increased use of the Cognitive Reserve Hypothesis as a framework for investigating the mechanisms that underlie development of AD, and would encourage research into how knowledge of an individual’s educational level might aid in the early and accurate diagnosis of the disease.

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