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Areas of Investigation with Respect to Reserve and Resilience

- Population Studied:
 - Older adults in longitudinal general population cohort studies
- Methods:
 - For reserve, primarily path modeling of cognitive outcomes and their life course determinants
 - For resilience, regression models testing life course modifiers associations between adverse exposures or neuropathology and cognitive outcomes
- Measures:
 - Cognitive outcomes are fluid abilities including mental status
 - Cognitive reserve is captured by crystallized ability
 - Key life course determinants are cognitive development and educational attainment
 - Other determinants are genetic (*APOE* ϵ 4), parental socioeconomic status (paternal occupation, maternal education) and midlife occupational complexity

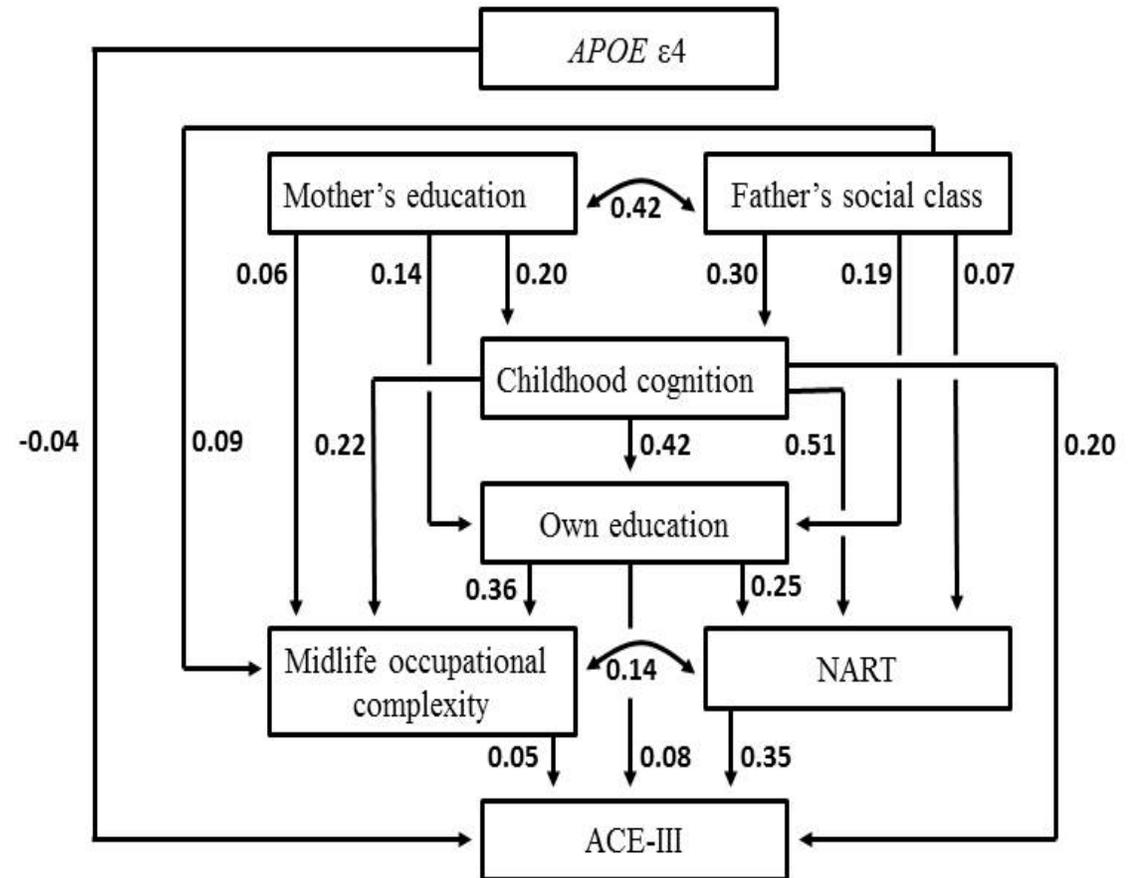
Concepts Used In Research

- **Cognitive reserve** → the cumulative improvement, through environmental factors, of intellectual resources ('crystallized' cognitive ability) that mitigate the rate and functional consequences of decline in fluid cognitive functions, and ultimately the clinical expression of dementia
- **Crystallized ability** → a type of cognitive function, mainly grounded in abstract and world knowledge, that accrues over the life course but is resistant to age- and morbidity-related decline (except in advanced dementia)
- **Resilience** → good (or 'good enough') function in spite of adverse exposures; e.g. maintained cognitive function in spite of severe chronic stress, physical morbidity, or preclinical neuropathology
- **Life course epidemiology** → the study of long term effects on later health or disease risk of physical or social exposures during gestation, childhood, adolescence, young adulthood and later adult life (Kuh & Ben Shlomo 2003)

Example of Data that Address One Concept

- Concept: cognitive reserve
- Measure:
 - Mental status (ACE-III) and how it relates to reserve (prior crystallized ability: NART)
- Key findings:
 - The NART is strongly and directly influenced by childhood cognition and education
 - The NART in turn part-mediates the influence of these factors on the ACE-III
- Implication:
 - Since the NART is relatively stable in later life, this will influence rate of ACE-III decline, and therefore risk of dementia

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All paths are mutually independent; only those $p < 0.05$ are shown.