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Areas of Investigation with Respect to Reserve and Resilience

- **Population Studied:**

- Longitudinal study of adults, age 80+ selected for their superior episodic memory performance (labelled, SuperAgers) and a 'control' group of cognitively average individuals with similar demographics, longitudinal study

- **Methods:**

- MRI, fMRI, PET, neuropathology, genetics, psychosocial and lifestyle factors.
- The project is designed to explore neurocognitive, psychosocial, neuropathologic, and genetic mechanisms of **resilience** and **resistance** to brain aging and Alzheimer's disease in a unique group of individuals with episodic memory performance at least as good as what would be considered average for 50-60 year-olds.

Concepts Used In Research

- **Resistance** → the avoidance of expected negative factor
 - Example: Superior memory performance in aging (i.e. resisting age-related memory decline)
 - Example: Resistance to the development of neuropathology associated with aging (i.e. resisting accumulation of tangles)
- **Resilience** → the ability to overcome effects of a negative factor
 - Example 1: Superior memory performance in the presence of a significant atrophy of the hippocampus (i.e., resilience to the negative factor of atrophy)
 - Example 2: Superior memory performance in the presence of significantly high levels of AD pathology (i.e., resilience to the negative factor of plaques and tangles).
- **Compensation** → the recruitment of resources outside of the usual sources to achieve a desired result

*Definitions are not specific to a particular topic but instead specific to a phenomenon

Resistance to age-related brain atrophy

- **Concept:** resistance
- **Measure:** structural MR measurements of atrophy
- **Operational question:** Do SuperAgers resist age-related atrophy?

SuperAgers show **resistance** to commonly reported age-related atrophy:

1. Compared to cognitively average middle-aged adults, cognitively average elderly show atrophy, while SuperAgers do not (brain resistance).
2. Atrophy rates over time are lower in SuperAgers than Cognitively Average Controls 80+ year-olds (brain resistance)

