

Lawrence Whalley, MD

University of Aberdeen

A Normative Investigation of Reserve and Resilience

- **Population:** Sample of 791 healthy community residents born 1921 or 1936. All were IQ tested age 11 years and without serious illness or sensory impairments. Approx 80% of eligible population volunteered.
- **Method:** 12 y longitudinal study of changes in health and cognition.
- **Analyses:** Associations between IQ age 11, life course data and ~biannual measures of five cognitive domains with genetic, nutrition, vascular disease and social data. 50% sample provided MRI exam data with fMRI sub-study.

Concepts Used In Research

- **Reserve** : A “catch-all” that integrates the cumulative benefits of early life advantages, education, nutrition, job history, lifetime mental and physical health. Together these preserve cognitive functions in the face of severe mental illness or chronic neurologic disease or deleterious age-related brain changes.
- **Maintenance** : Has two major components: (1) that enhance neural health through neurobiological pathways involving neural regeneration,, differentiation and cellular protection/repair and (2) act through pathways that involve cognitive effort, social interaction and promote physical well-being. Synergism between these components contributes to neural health and reduced harm of the effects on brain of aging or severe mental illness and/or age-related disease.
- **Compensation** : A complex mix of processes that rely on self-organization of cortical networks and adaptive behaviours. Their net effect is to make available resources sufficient to reduce or mask cognitive deficits attributable to neural dysfunction occurring after acute brain injury or chronic neurodegeneration.

How Aberdeen data address the reserve concept

- **Concept:**

RESERVE

- **Measures:**

Life course exposures and repeated cognitive tests

- **Operational definition:**

Cognitive test trajectories ages 63 to 82 are influenced by passive and active processes:

1. Passive life course exposures determine baseline performance - **intercept**
2. Active processes influence cognitive change with major effects of childhood IQ and practice - **slope**

