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Areas of Investigation with Respect to Reserve and Resilience

- **Population Studied:** Healthy older adults and patients with MCI and AD- cross sectional analyses presented here
- **Methods:** PET imaging of β amyloid (Aβ) with ^{11}C Pittsburgh Compound B (PiB) and tau with ^{18}F Flortauecipir (FTP)
- **Areas of Investigation:** My work has focused on the factors that influence the relationship between cognition and pathologic burden across the Alzheimer Dementia spectrum and in Preclinical Alzheimer's disease, a stage where normal cognition is maintained despite increased pathological burden.

Concepts Used In Research

- **Reserve** → defined as an individual's ability to maintain cognitive performance in the context of increasing amyloid and tau burden. We have not used the terms maintenance or compensation.

  - Theoretically, I have thought that there is a dissociation between cognitive and brain reserve i.e., use of cognitive strategies (CR) vs. additional neuronal connections (BR). I have not studied brain reserve per se.

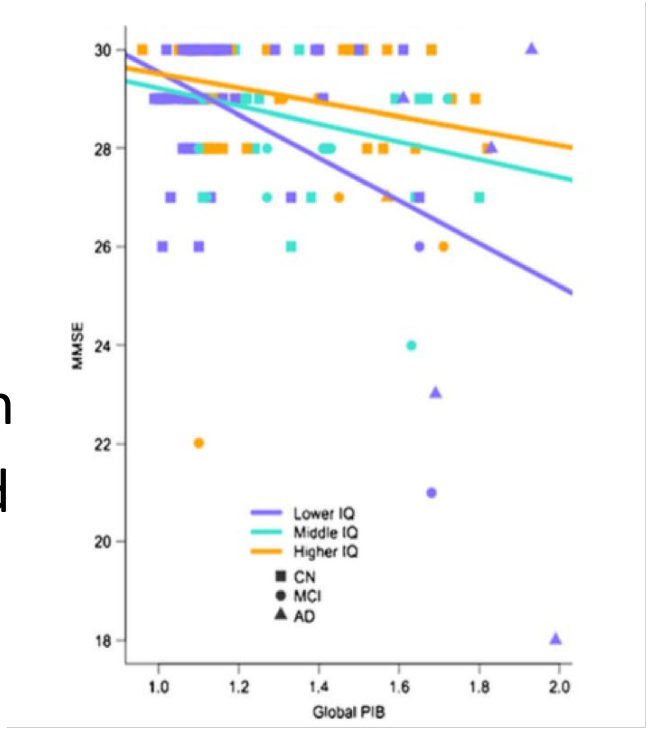
  - The main proxy of reserve that we have included in our research was a measure of estimated intelligence (AMNART-EIQ), as our early studies found a bias where women were less educated then men, despite having high levels of IQ. When both education and AMNART were included in statistical models, AMNART had the greater effect. We divided AMNART into 3 IQ groups- high, middle and low.

Example of Data that Addresses CR, Performance and Amyloid and Tau Status

- **Concept:** Reserve
- **Measure:** MMSE, AMNART IQ, Aβ and IFT Tau PET imaging. In separate linear regression models predicting MMSE, we examined the interactions of CR x global Aβ and CR x IFT tau across all participants
- **Operational definition:** Higher CR related to maintained MMSE performance in context of elevated Aβ and IFT tau burden
- **Findings:** The interaction between CR and IFT tau was significant ($p < 0.003$), such that higher CR participants with elevated IFT tau had better MMSE scores compared with low CR participants with similar levels of IFT tau. The interaction between CR and Aβ status did not reach significance ($p = 0.093$).

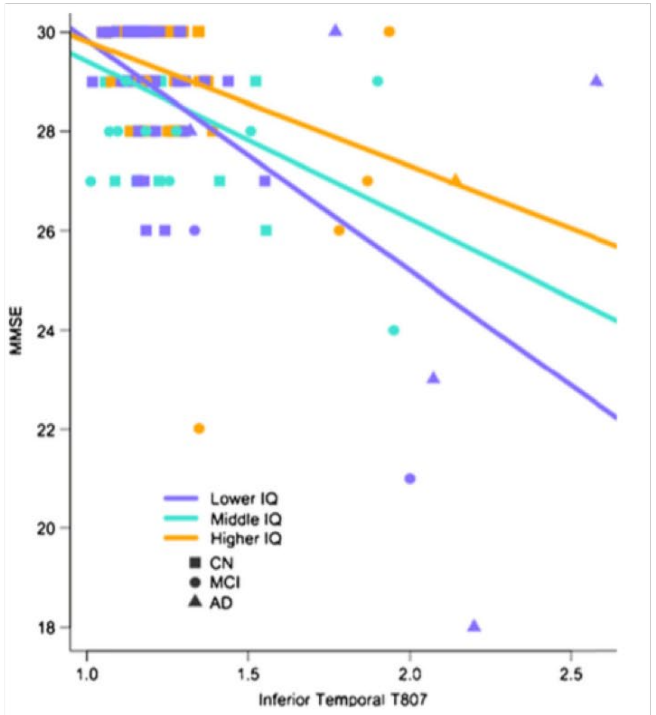
Cross-sectional Relationship Across Disease Spectrum

CR X Global Aβ on MMSE



β= 0.09, *p= 0.093*

CR X IFT tau on MMSE



β= 0.14, *p= 0.003*

Rentz, et al., Brain Imaging Behav; 11(2): pp. 383-390.