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Area of Investigation: Compensation

- Population Studied: Healthy older adults, cross sectional
- Methods: fMRI, PET
- In this study, we investigated the effects of β -amyloid on neural activity during memory encoding, with the aim of understanding how the deposition of β -amyloid affects the relationship between neural activity and the detail of the encoded memory.

Concepts Used In Research

Resistance → absence of brain pathology (usually reflecting AD), particularly in a situation in which it would be expected (i.e., low $A\beta$ in an E4 carrier, low tau in someone with extensive $A\beta$ deposition)

Reserve → neural endowment that mitigates the effect of pathological and age-related processes. A specific form of resilience

Compensation → temporally dynamic alterations in neural resources that are evoked in response to evident or suspected pathology and which are related to preserved or superior performance. Another form of resilience

Compensation Example

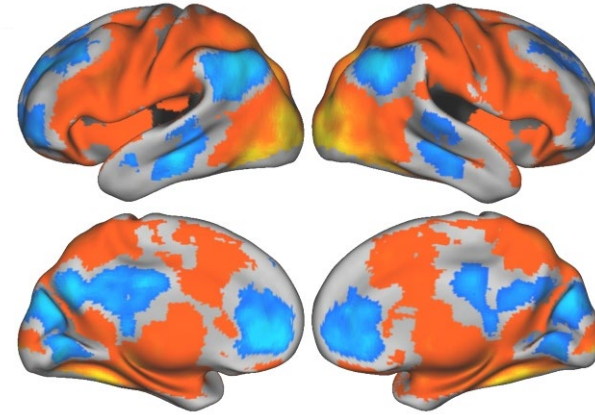
- Measure: fMRI activity vs details of encoded stimuli
- Operational definition, greater fMRI activity:
 1. In PIB+ (neurological lesion)
 2. \uparrow Activity \rightarrow \uparrow Performance

Experiment:

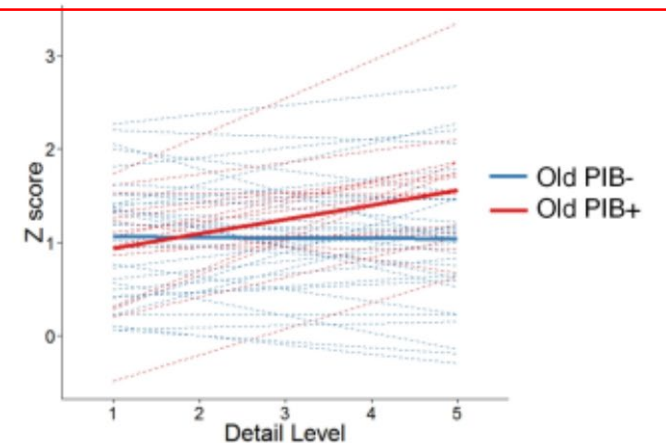
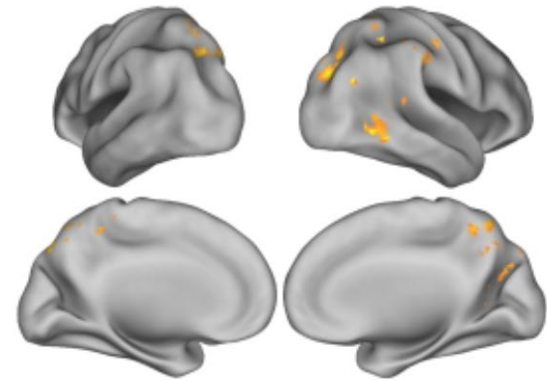
View images during fMRI acquisition

Assess “gist” memory with written descriptions

Probe memory richness with 6 T/F questions about stimuli



Successful encoding (gist), mask used for detail analysis



Linear contrast of activity related to number of details by older $A\beta+$ (N=16) and $A\beta-$ (N=33). Increasing activity in $A\beta+$ is associated with more detailed memory