1-1-2012

Episodic Memory Measures Complement Structural and Functional MRI for Predicting Cognitive Decline in Apolipoprotein E ε4 Carriers

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LONG-TERM MEMORY: Development & aging

D54
INTER-INDIVIDUAL VARIABILITY IN CRITERION SHIFTING ACROSS THE LIFESPAN

Brian Lopez1, Craig Bennett1, Tyler Santander1, Michael Miller1; 1University of California, Santa Barbara — A critical aspect of recognition memory is the integration of available memory evidence and a decision criterion. Previous work has shown that a wide range of factors can affect the placement of a decision criterion, including cognitive and personality factors. In this study we attempted to quantify the impact of aging on criterion placement during episodic recognition. To that end, we used fMRI to examine recognition behavior and regional brain activity in 30 young adults (25-35 yrs) and 30 elderly subjects (60-75 yrs) during a task involving criterion shifting. Subjects were first asked to encode 150 words for later recognition. The words were then presented alongside new, unobserved words in conditions of high target probability (70%, old, 30% new) and low target probability (30%, old, 70% new). Subjects had to decide for each word whether it was a target old word or a non-target new word. The results demonstrated that target discrimination ability (d-prime) was lower in the elderly group, and that the elderly group showed increased variability in the degree of criterion shifting between the two probability conditions. We also found that the elderly group had significantly increased inter-individual variability in regional brain activity relative to the young adult group while performing the task. The results suggest that aging is associated with increased variability in criterion shifting and in the regional brain activity that accompanies such criterion shifts.

D55
THE CONTRIBUTION OF BLOOD SERUM BIOMARKERS TO THE PREDICTION OF COGNITIVE DECLINE BY FMRI AND APOLIPOPROTEIN-E4 IN HEALTHY OLDER ADULTS

Kristy A. Nielsen1,2, Michael A. Sugaraman1, John L. Woodard1, Michael Seidenberg2, J. Carson Smith3, Sally Durgerian2, Stephen M. Rao1; 1Marquette University, 2Medical College of Wisconsin, 3Wayne State University, — A mixed-effects model was used to examine the contribution of serum biomarkers to the prediction of cognitive decline using structural (sMRI) and functional (fMRI) magnetic resonance imaging. The findings support protected encoding of within-domain association learning in amnestic mild cognitive impairment (aMCI) patients, revealing no significant interaction [F(4,13) = 1.56, p = .22], and a positive effect of age (p = .04) and serum ApoE4 carrier status (p = .02) on encoding performance in aMCI patients. The results suggest that serum biomarkers may be useful in predicting cognitive decline and may provide insights into the underlying mechanisms of aging and cognitive decline.

D56
EPISODIC MEMORY MEASURES COMPLEMENT STRUCTURAL AND FUNCTIONAL MRI FOR PREDICTING COGNITIVE DECLINE IN APOLIPOPROTEIN E4 CARRIERS

John L. Woodard1, Michael Seidenberg2, Kristy A. Nielsen1,5, Michael A. Sugaraman1, J. Carson Smith3, Sally Durgerian2, Alissa M. Butts1, Melissa A. Lancaster4, Mary K. Foster2, Nathan C. Hanke1, Monica A. Matthews2, Stephen M. Rao2, — A mixed-effects model was used to examine the contribution of serum biomarkers to the prediction of cognitive decline using structural (sMRI) and functional (fMRI) magnetic resonance imaging. The findings support protected encoding of within-domain association learning in amnestic mild cognitive impairment (aMCI) patients, revealing no significant interaction [F(4,13) = 1.56, p = .22], and a positive effect of age (p = .04) and serum ApoE4 carrier status (p = .02) on encoding performance in aMCI patients. The results suggest that serum biomarkers may be useful in predicting cognitive decline and may provide insights into the underlying mechanisms of aging and cognitive decline.