ABSTRACT
THE ROLE OF RESPONSE INHIBITION IN MEMORY AWARENESS: AN ERP STUDY ON ASYMPTOMATIC OLDER ADULTS AND THOSE AT GENETIC RISK FOR ALZHEIMER'S DISEASE

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The Alzheimer's disease (AD) literature has begun shifting its focus to examining accuracy of subjective memory complaints (SMC), or memory awareness, rather than self-reported cognitive complaints, as a possible predictor of future cognitive decline. Evidence has implicated executive functioning in awareness of memory across the AD spectrum, with more recent literature implicating specific executive subprocesses (i.e., response inhibition). Little is known, however, with respect to the relationship between memory awareness and response inhibition in asymptomatic older adults and older adults at greater risk for AD.

This study examined the relationship between response inhibition and discrepancy between subjective and objective memory performance (i.e., memory awareness) in asymptomatic older adults, as well as the impact genetic risk for AD (via the Apolipoprotein-E (APOE) ε4 status) has on this relationship. Event related potentials (ERP) were used as neural indices of response inhibition. Participants (n =34 cognitively intact older adults, 15 of whom were APOE ε4 carriers) completed an assessment of perceived memory functioning, objective cognitive performance, and a stop-signal task while EEG data were collected for later extraction of ERPs.

ERP components were significant predictors of discrepancy between subjective and objective memory in asymptomatic older adults. Moreover, APOE ε4 carrier status moderated the relationship between ERP amplitude during successful stopping and discrepancy scores. Specifically, ε4 carriers who exhibited inefficient response inhibition (via altered ERP amplitudes) overestimated their memory functioning.

Overall, this study revealed that altered neural efficiency during response inhibition may underly deficits in memory awareness in cognitively intact older adults, and this may be particularly important in the context of AD genetic risk. Results highlight the importance of assessing SMC accuracy and help discriminate at-risk individuals whose awareness of memory may be associated with pathophysiological changes across the AD spectrum.