Objective:
Stress responsivity has long been implicated as contributing to the risk of Alzheimer's Disease (AD). Among the procedures used to study stress, the Trier Social Stress Test (TSST) has emerged as the gold-standard method, yet studies of stress using the TSST in individuals at risk for AD are lacking. We aimed to explore the tolerability of this procedure and to study the association between cognitive test performance and subjective distress in response to the TSST in individuals at risk for AD. Based on prior preclinical and human studies showing associations between stress and performance on tests of memory and executive functioning in particular, we predicted that performance on tests of these domains would predict individuals' subjective responses to a social stressor in individuals at risk for AD.

Method:
Participants were included in the study if they had at least one of the following risk factors for AD: mild cognitive impairment, presence of apolipoprotein E e4 allele, history of AD in a first-degree relative, subjective memory concerns. The sample comprised 26 individuals (14 women, 12 men) ages 60 – 87 years (mean 72.6; SD = 6.4). As part of a larger study, subjects were administered a cognitive test battery and underwent the TSST. At prespecified intervals 3 points prior to, and 6 points following the TSST, subjects indicated their subjective distress on a visual analog scale. Composite scores representing memory and executive domains were derived by calculating the sum of standardized scores on a test of word-list learning and memory (memory domain), and part B of the Trail Making Test, and Digit Span Backwards (executive domain). Areas under the curves (AUC) were computed using the trapezoidal method for subjective distress ratings for all points prior to the TSST and all points following the TSST. The difference between the post-TSST and pre-TSST AUCs indicated TSST response. We then examined the correlations between the two cognitive domain scores with the three subjective distress AUCs.

Results:
No individuals withdrew from participation during the TSST. Results indicate no correlation between either cognitive domain and pre-TSST subjective ratings of distress, and memory performance was not correlated with subjective distress at any time (all correlation coefficients were less than .09). In contrast, higher scores on the executive domain correlated with lower subjective distress in response to the TSST ($R = .40$, $p = .021$).

Conclusion(s):
Our findings provide support for the tolerability of the TSST in older adults at risk for AD. Our hypothesis regarding the association between memory and subjective distress was not supported. In contrast, our hypothesis regarding executive functioning was supported such that the greatest distress in response to a social stressor was seen in those with lower executive domain scores. These findings suggest that in individuals at risk for AD, poor memory does not contribute to subjective distress, whereas lower executive functioning does. If confirmed in studies of larger samples, our findings indicate that interventions targeting executive functioning may mitigate the risk of AD conferred by stress sensitivity in older individuals.