

**Objective:** The Apolipoprotein E (APOE) gene has been established in the Alzheimer's disease (AD) literature to impact brain structure and function and may also show congruent effects in healthy older adults, although findings in this population are much less consistent. Magnetic Resonance Imaging (MRI), Diffusion Tensor Imaging (DTI), and neuropsychological measures present as useful, non-invasive tools to investigate the impact of APOE- $\epsilon$  allele status on grey matter structure, white matter integrity, and cognitive functioning, respectively. Nonetheless, studies to date have revealed mixed findings and few studies have taken a multimodal approach to investigating APOE's effects. Thus, the objective of the current study was to replicate and expand upon the multimodal neuroimaging study conducted by Honea et al. (2009), that examined the impact of APOE- $\epsilon$ 4 presence on brain structure and cognitive function in healthy older adults, with the addition of APOE- $\epsilon$ 2 carriers and cognitive composite measures. The aim of the current replication study was to identify reliable changes to grey matter volume and white matter integrity in healthy older adults as it relates to APOE- $\epsilon$  allele presence and cognitive performance. This represents one of the first studies to investigate both the risk and protective effects of APOE- $\epsilon$  alleles ( $\epsilon$ 4 and  $\epsilon$ 2 respectively) on measures of cognitive performance, GMV and white matter integrity in healthy older adults.

**Participants and Methods:** Data were obtained from the Alzheimer's Disease Initiative phase 3 (ADNI3) database. Baseline MRI, DTI and cognitive composite scores for memory (ADNI-Mem) and executive function (ADNI-EF) were acquired from 116 healthy controls. Participants were grouped according to APOE allele presence (APOE- $\epsilon$ 2+ N= 17, APOE- $\epsilon$ 3 $\epsilon$ 3 N= 64, APOE- $\epsilon$ 4+ N=35). Voxel-based morphometry (VBM) and tract based spatial statistics (TBSS) were used to compare grey matter volume (GMV) and white matter integrity respectively between APOE- $\epsilon$ 2+ and APOE- $\epsilon$ 3 $\epsilon$ 3 controls, and again between APOE- $\epsilon$ 4+ and APOE- $\epsilon$ 3 $\epsilon$ 3 controls. Multivariate analysis of covariance (MANCOVA) was used to examine the effects of APOE polymorphism on memory and EF across all APOE groups with covariates of age, sex, education, and cognitive scores were correlated with imaging metrics within groups (Pearson r) to examine associations between cognitive performance and brain structure.

**Results:** Consistent with findings from Honea et al. (2009), no significant differences were seen

across APOE groups, within-groups in MRI metrics, or cognitive performance ( $p > 0.05$ , corrected for multiple comparisons). Taking a similar approach to Honea and company, non-significant, trend-level results were examined ( $p < 0.2$ , corrected for multiple comparisons) and suggested: 1) Decreased GMV and increased mean diffusivity (MD) were present in APOE- $\epsilon$ 4+ compared to APOE- $\epsilon$ 3 $\epsilon$ 3 and 2) Increased GMV and fractional anisotropy (FA) were present in APOE- $\epsilon$ 2+ compared to APOE- $\epsilon$ 3 $\epsilon$ 3.

**Conclusions:** The current study replicated and extended previous findings. Trend-level findings across both the current and replicated study suggests there may be subtle neurostructural differences in healthy aging as a function of APOE- $\epsilon$ 4 status. The current study additionally found potential subtle differences in GMV and white matter integrity in APOE- $\epsilon$ 2 carriers at the trend-level, consistent with previous reports of APOE- $\epsilon$ 2's protective effects against neurodegeneration. Although these findings should be interpreted with caution, trend-level effects seen in the current study are consistent with previous research and may hold important implications for APOE neuromechanisms.

**Categories:** Aging

**Keyword 1:** apolipoprotein E

**Keyword 2:** neuroimaging: structural

**Keyword 3:** cognitive functioning

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## 5 Cross-cultural Diagnostic Validity of the Multilingual Naming Test (MINT) in a Sample of Older Adults.

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**Objective:** The current study aimed to evaluate the psychometric properties and diagnostic accuracy of the 32-item version of the Multilingual Naming Test (MINT) in a sample of

English and Spanish monolinguals and bilingual older adults from two ethnic groups (EA; European Americans and HA; Hispanic American) with typical and atypical aging. An IRT model was used to identify 24 MINT Items assessed across ethnicity and language testing groups (Spanish and English). We analyzed the discriminant and predictive validity of the 32-item and 24-item scales across diagnostic groups (cognitively normal [CN], mild cognitive impairment [MCI], and dementia [AD]). Diagnostic accuracy was then assessed with both versions applying ROC (Receiver Operating Characteristics) curve reporting using AUC (Area Under the Curve). We expected the MINT to distinguish between the CN and AD groups but not between CN and MCI and the MCI and AD. We conducted IRT analyses to evaluate the cross-language validity of the items from the 32-item MINT in English and Spanish through Rasch Analysis across our two ethnic groups. Finally, we tested the association between MINT scores and MRI volumetric measures of language-related areas in both cerebral hemispheres' temporal and frontal lobes.

**Participants and Methods:** The sample comprised 281 participants (178 females) enrolled in the 1Florida Alzheimer's Disease Research Center (ADRC), with 175 participants self-identified as HA (51 tested in English and 124 in Spanish) and 106 EA, all of them monolingual English speakers. The participants were classified into three diagnostic groups: 1. CN ( $n = 94$ ); 2. MCI ( $n = 148$ ); and 3. AD ( $n = 39$ ). Participants are evaluated yearly through a comprehensive neuropsychological battery, including the MINT is a standard CN task that requires patients to retrieve words upon presentation of a line drawing.

**Results:** We obtained a ceiling effect in four items (Butterfly, Glove, Watch, and Candle). Four items were easier in English (Blind, Gauge, Porthole, and Pestle) and four in Spanish (Dustpan, Funnel, Anvil, and Mortar). In the 32-item version of the MINT, EA scored significantly higher than HA, but when removing those eight items, the ethnic difference was attenuated and no longer statistically significant (controlling for education). The ROC curves showed that both versions of the MINT had poor accuracy when identifying CN participants and were acceptable in identifying dementia participants but unacceptable for classifying MCI participants. The 32-item MINT in English and Spanish and the 24-item MINT in Spanish were significantly

correlated with the bilateral MTG. However, the 24-item MINT in English was only correlated with this area's volume in the right hemisphere. The left FG correlated with MINT scores regardless of language and MINT version. We also found some differential correlations depending on the language of administration. The bilateral hippocampi, STG, MTG and FG, and right ITG were significantly correlated only with MINT Spanish scores, while the left ITG was significant only when either version of the MINT was administered in English.

**Conclusions:** Our results highlight the importance of analyzing cross-cultural samples when implementing neuropsychological tests.

**Categories:** Aging

**Keyword 1:** dementia - Alzheimer's disease

**Keyword 2:** assessment

**Keyword 3:** language: second/foreign

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## 6 Depressive Symptoms are Associated With Decline Over Time in Verbal Fluency Performance in Female but not Male Community-Dwelling Older Adults

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**Objective:** Late-life depression is prevalent among older adults and the presence of depressive symptoms has been shown to be associated cross-sectionally with worse verbal fluency performance. There is limited and mixed evidence as to whether depressive symptoms impact change in verbal fluency performance over time, and whether gender impacts this relationship.

**Participants and Methods:** Participants were community-dwelling older adults who were dementia-free at baseline ( $N = 522$ ;  $M$  age = 75.96,  $SD \pm 6.46$  years). Baseline depressive symptoms were measured using the Geriatric Depression Scale. Category fluency and letter fluency performance, using the Controlled Oral Word Association Test (COWAT), were examined annually. Linear mixed effects models stratified by gender examined whether associations between baseline depressive