Objective: Chronic traumatic encephalopathy (CTE) is a neurodegenerative disease that can only be diagnosed at post-mortem. Revised criteria for the clinical syndrome of CTE, known as traumatic encephalopathy syndrome (TES), include impairments in episodic memory and/or executive function as core clinical features. These criteria were informed by retrospective interviews with next-of-kin and the presence and rates of objective impairments in memory and executive functions in CTE are unknown. Here, we characterized antemortem neuropsychological test performance in episodic memory and executive functions among deceased contact sport athletes neuropathologically diagnosed with CTE.
Participants and Methods: The sample included 80 deceased male contact sport athletes from the UNITE brain bank who had autopsy-confirmed CTE (and no other neurodegenerative diseases). Published criteria were used for the autopsy diagnosis of CTE. Neuropsychological test reports (raw scores) were acquired through medical record requests. Raw scores were converted to z-scores using the same age, sex, and education-adjusted normative data. Tests of memory included long delay trials from the Rey Complex Figure, CVLT-II, HVLT-R, RBANS, and BVMT-R. Tests of executive functions included Trail Making Test-B (TMT-B), Controlled Oral Word Association Test, WAIS-III Picture Arrangement, and various WAIS-IV subtests. Not all brain donors had the same tests, and the sample sizes vary across tests, with 33 donors having tests from both domains. Twenty-eight had 1 test in memory and 3 had 2+. Eight had 1 test of executive function and 46 had 2+. A z-score of 1.5 standard deviations below the normative mean was impaired. Interpretation of test performance followed the American Academy of Clinical Neuropsychology guidelines (Guilmette et al., 2020). Bivariate correlations assessed cumulative p-tau burden (summary semi-quantitative ratings of p-tau severity across 11 brain regions) and TMT-B (n=34) and CVLT-II (n=14), the most common tests available.
Results: Of the 80 (mean age= 59.9, SD=18.0 years; 13, 16.3% were Black), 72 played football, 4 played ice hockey, and 4 played other contact sports. Most played at the professional level (57, 71.3%). Mean time between neuropsychological testing and death was 3.9 (SD= 4.5) years. The most common reason for testing was dementia-related (43, 53.8%). Mean z-scores fell in the average psychometric range (mean z= -0.52, SD=1.5, range= -6.0 to 3.0) for executive function and the low average range for memory (mean z= -1.3, SD=1.1, range= -4.0 to 2.0). Eleven (20.4%) had impairment on 1 test and 3 (5.6%) on 2+ tests of executive functions. The most common impairment was on TMT-B (mean z= -1.77, 13 [38.2%] impaired). For memory, 13 (41.9%) had impairment on 1 test. Of the 14 who had CVLT-II, 7 were impaired (mean z= -1.33). Greater p-tau burden was associated with worse performance on CVLT-II (r= -.653, p= .02), but not TMT-B (r= .187, p>.05).
Conclusions: This study provides the first evidence for objectively-measured impairments in executive functions and memory in a sample with known, autopsy-confirmed CTE. Furthermore, p-tau burden corresponded to worse memory test performance. Examination of neuropsychological tests from medical records has limitations but can overcome shortcomings of retrospective informant reports to provide insight into the cognitive profiles associated with CTE.

Categories: Dementia (Non-AD)
Keyword 1: brain injury
Keyword 2: memory complaints
Keyword 3: dementia - other cortical
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60 Are all Embedded Measures Created Equal? A look at Embedded PVTs in Major Neurocognitive Disorder

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Objective: Although performance validity is critical in determining the quality and accuracy of test data, research suggests not all neuropsychologists incorporate performance validity tests (PVTs) in dementia evaluations (McGuire et al., 2019). Furthermore, well-validated embedded measures, such as Reliable Digit Span (RDS) from the Wechsler Adult Intelligence Scale – Fourth Edition (WAIS-IV),

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have evidenced an unusually high number of failures in a dementia population when utilizing typical clinical cut-offs (Zenisek et al., 2016). The objective of this study is to explore performance on embedded PVTs among older adults who have a major neurocognitive disorder (MND), specifically among Alzheimer disease (AD) and non-AD patients.
Participants and Methods: Archival data from outpatient neuropsychological evaluations were analyzed. All participants were at least 65 years of age, diagnosed with a MND, and completed Digit Span from the WAIS-IV, Brief Visuospatial Memory Test- Revised (BVMT-R), and Hopkins Verbal Learning Test-Revised (HVLT-R). In total, 84 participants, aged 67-96 (M=78.44, SD=6.11) with 6-20 years of education (M=13.47, SD=3.30), were included. The sample predominantly identified as female (n=60) and White (n=61). More individuals were diagnosed with AD (n=50) than non-AD dementia (n=34). Common non-AD diagnoses included Vascular (n=44), Lewy bodies (n=8), and Parkinson's (n=2) dementias. Fisher's Exact Test of Independence was used to account for the smaller sample to determine if there was a nonrandom association between diagnosis (AD vs non-AD) and embedded PVT performance: RDS≤ 7, BVMT-R Hits<4, BVMT-R Recognition Discrimination (RD) ≤ 4, and HVLT-R RD ≤ 5 (Bailey et al., 2018).
Results: The Fisher's Exact Test of Independence revealed a statistically significant association between neurocognitive diagnosis and RDS (p= .008), BVMT-R RD (p<.001), and HVLT-R RD (p<.001). BVMT-R Hits were not significantly associated with diagnosis (p = 0.10). These measures evidenced opposite patterns with RDS demonstrating a higher percentage of fails for the non-AD (63%) versus AD (20%) group. The AD group had a higher percentage of fails for BVMT-R RD (58% for AD and 13% for non-AD groups) and HLVT-R RD (66% for AD and 29% for non-AD group).
Conclusions: The current study suggests performance on embedded PVTs vary across MND diagnoses. Individuals with a non-AD diagnosis were more likely to fail RDS than those with AD. This is likely secondary to attention and working memory demands that are mediated by the frontal-subcortical networks, which are less impacted by AD pathology (Bonelli & Cummings, 2022; Loring et al., 2016). In contrast, AD patients were more likely to fail embedded PVTs within memory measures, which are largely mediated by the mesial temporal cortex associated with AD (Pluta, 2022). These results suggest embedded measures operate differently based on diagnosis and neuroanatomical systems affected. The clinical relevance of these findings includes potentially using alternative PVTs or different cut-offs based on diagnosis. Future research should attempt to better delineate more appropriate, as well as time efficient, PVTs among the dementia population.

Categories: Dementia (Non-AD)
Keyword 1: performance validity
Keyword 2: dementia - Alzheimer's disease
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61 The Impact of Cognitive Reserve on Executive Function in Dementia

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Objective: Cognitive reserve (CR) refers to how flexibly and efficiently the individual makes use of available brain resources. Early-life education, midlife social and occupational activities, and later-life cognitive and social interactions are associated with greater CR. Years of education, premorbid intellectual (IQ) functioning, linguistic ability, and occupational complexity are often used as proxies of CR. CR theory seeks to explain discrepancies between the extent of disease pathology and clinical presentation amongst individuals with dementia. In the presence of Alzheimer's Disease (AD) pathology, higher CR is associated with slower declines in executive functioning (EF). The current study examined the correlation between CR and EF performance across various stages of dementia severity as measured by the total score on the Clinical Dementia Rating Scale (CDRS).
Participants and Methods: The study cohort consisted of 269 individuals who had completed measures of EF and the CDRS from phase 1 of the Alzheimer's Disease Neuroimaging Initiative

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