neurologic etiologies. The aim of this study was to validate a Spanish list learning task developed as a linguistically appropriate measure of memory in a diverse sample of Spanish speaking Bay Area older adults who identify as Hispanic/Latino.

Participants and Methods: Cognitive scores were assessed in 72 Spanish-speaking older adults living in the Bay Area, California, originally from different countries across South and Central America [(n=29 with CDR scores of 0; n=31 with CDRs of 0.5; and n=12 with CDR of 1), aged 54-96, 30% male)], who completed the Spanish list learning task and a brief neuropsychological battery. The list learning task contains 9 words, 3 words from 3 different semantic categories. Category exemplars were excluded. Administration includes three immediate recall trials, a 30-second delay free recall, 10-minute delay free and cued recall, and yes/no recognition. In this initial validation study, we selected the 10-minute delay recall trial as our primary variable and looked at several indices of construct validity. We hypothesized delayed free recall would: 1) correlate highly with other episodic memory tasks, and minimally with non-memory tests (controlling for CDR sum of boxes), and 2) show step-wise declines as total CDR increased from 0 to 1 (controlling for age, sex, and education).

Results: Delayed recall scores of 30-seconds and 10-minutes showed step-wise declines as CDR scores increased (CDR 0 vs. 1, p<0.001 and CDR 0.5 vs. 1, p=0.001). There were no differences in delayed recall between CDR 0 vs. CDR 0.5 (p>0.05). 10-minute delay showed medium-to-large correlations with UDS Craft Story Delayed Recall (partial r =0.45, p<0.001) and Benson Complex Figure Recall (partial r=0.63, p<0.001). Nonsignificant, weaker associations were observed with measures of executive (F Word Verbal Fluency partial r=0.10, Digit Span Forward partial r=0.12), and language (Animal Fluency partial r=0.18) function.

Conclusions: Although there is heterogeneity within Hispanic/Latino populations in the U.S., findings begin to support ecological and construct validity of the Spanish list learning task as a measure of verbal memory in older Spanish-speaking adults in the Bay Area. Supporting ecological validity, delayed recall scores significantly differentiated functionally impaired (CDR=1) from functionally mild or unimpaired older adults (CDR=0 or 0.5), though evidenced less sensitivity differentiating

unimpaired from mild stages of illness. The Spanish list learning task evidenced strong construct validity as a measure of episodic memory, including strong correlations with other validated memory tasks, and non-significant correlations with non-memory tasks. Larger studies should account for diversity of Spanish speakers in the U.S to see how region of origin, education, and differences between first- and second-generation Spanish speakers influences performance on the task. Future work incorporating imaging markers of brain structure may help further validate the Spanish list learning task as an appropriate measure of memory.

Categories:
Assessment/Psychometrics/Methods (Adult)
Keyword 1: aging disorders
Keyword 2: diversity
Keyword 3: dementia - Alzheimer's disease
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58 Preliminary Development of a Virtual Reality Neuropsychological Assessment System

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Objective: While there exist numerous validated neuropsychological tests and batteries to measure cognitive and behavioral capacities, the vast majority of these are time intensive and difficult to administer and score outside of the clinic. Moreover, many existing assessments may have limited ecological validity in some contexts (e.g., military operations). Therefore, we have been developing a novel approach to administering neuropsychological assessment using a virtual reality (VR) "game" that will collect simultaneously acquired multi-dimensional data that is synthesized by machine

learning algorithms to identify neurocognitive strengths and weaknesses in a fraction of the time of typical assessment approaches. For our initial pilot project, we developed a preliminary VR task that involved a brief game-like military "shoot/no-shoot" task that collected data on hits, false alarms, discriminability, and response times under a context-dependent rule set. This prototype task will eventually be expanded to include a significantly more complex set of tasks with greater cognitive demands, sensor feeds, and response variables that could be modified to fit many other contexts. The objective of this project was to construct a rudimentary pilot version and demonstrate whether it could predict outcomes on standard neuropsychological assessments.

Participants and Methods: To demonstrate proof-of-concept, we collected data from 20 healthy participants from the general population (11 male; age=24.8, SD=7.8) with high average intelligence (IQ = 112, SD=10.7). All participants completed the Wechsler Abbreviated Scale of Intelligence-II (WASI-II), and several neuropsychological tests including the ImPACT, the Attention and Executive Function modules of the Neuropsychological Assessment Battery (NAB), and the VR task. Initially, we used a prior dataset from 359 participants (n=191 mild traumatic brain injury; n=120healthy control; n=48 sleep deprived) to serve as a training sample for machine learning models. Based on these outcomes, we applied machine learning, as well as standard multiple regression approaches to predict neuropsychological outcomes in the 20 test participants.

Results: In this limited study, the machine learning approach did not converge on a meaningful prediction due to the instability of the small sample. However, standard multiple linear regression using stepwise entry/deletion of the VR task variables significantly predicted neuropsychological performance. The VR task predicted WASI-II vocabulary (R=.457, p=.043), NAB Attention Index (R=.787, p=.001), and NAB Executive Function Index (R=.715, p=.002). Interestingly, these performances were generally as good or better than the predictions resulting from the ImPACT, a commercially available neuropsychological test battery, which correlated with WASI-II vocabulary (R=.557, p=.011), NAB Attention Index (R=.574, p=.008), and NAB Executive Function Index (R=.619, p=.004).

Conclusions: Our pilot VR task was able to predict performances on standard neuropsychological assessment measures at a level comparable to that of a commercially available computerized assessment battery, providing preliminary evidence of concurrent validity. Ongoing work is expanding this rudimentary task into one involving greater complexity and nuance. As multivariate data integration models are incorporated into the tasks and extraction features, future work will collect data on much larger samples of individuals to develop and refine the machine learning models. With additional work this approach may provide an important advance in neuropsychological assessment methods.

Categories:
Assessment/Psychometrics/Methods (Adult)
Keyword 1: assessment
Keyword 2: computerized neuropsychological testing
Keyword 3: technology
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59 A Preliminary Investigation of Digital Clock Drawing in Fibromyalgia Patients Versus Non-Fibromyalgia Peers

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Objective: Widespread musculoskeletal pain disorders like fibromyalgia are often accompanied by varying levels of cognitive dysfunction. Fibromyalgia research suggests that around the time of diagnosis, typically 30-50 years of age, many patients are already showing cognitive difficulties on various neuropsychological assessments. It is unknown, however, how older adults with fibromyalgia perform on rapid cognitive screeners in clinical settings. The present study compared older adults with and without fibromyalgia on a digitized version of a classic neuropsychological screener, the clock drawing test.

Participants and Methods: Participants aged 65+ were recruited as part of a larger IRB-approved and federally funded investigation within the preoperative surgical center at the