other performance validity tests were gathered. The CIH demonstrated low diagnostic accuracy (AUC = .66; p >.05; CI = .51 -.81); a cut score of <8 resulted in a sensitivity of .96 and a specificty of .64. Logistic Regression showed that CIH performance significantly predicted performance validity (X2 = -0.93; df = 1; N = 68; p < .05), accounting for 18-28% of the variance in performance classification (Cox & Snell R2 = .18; Nagelkerke R2 = .28). It correctly classified 96% of valid performers, but only correctly classified 35% of invalid performers, with an overall correct prediction rate of 83%. A predicted chase in log odds (B= -.93) and odd ratio [Exp (B) =.40] indicated that every unit increase in CIH score was associated with a decrease probability of performance invalidity. Logistic regression was also used to calculate the probability of performance invalidity at each possible CIH score (Table 1).
Conclusions: Results suggests that poor performance on CIH does not necessarily equate to invalid performances, but instead, should act as a screener to cue neuropsychologists working with Veterans that additional PVTs should be considered. Overall, it was determined that CIH was able to correctly predict 35% of invalid performers and 96% of valid performers, with an overall correct prediction rate of 83%, suggesting the procedure may be too simple to be an effective standalone PVT for clinical use. These results also highlight that every correct response on the CIH was associated with a decreased probability of performance invalidity. Additionally, an AUC analysis determined the tests optimal cut off score to be <8, suggesting that shortening the procedure may be as effective as giving the full 10 trials.

Categories: Other
Keyword 1: performance validity
Keyword 2: neuropsychological assessment
Keyword 3: validity (performance or symptom)
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Poster Symposium: Leveraging Digital Technology to Capture Highly Nuanced Neuropsychological Behavior: Realizing the Vision of the Boston Process Approach to Neuropsychological Assessment

Chair

Anna MacKay - Brandt
Nathan Kline Institute for Psychiatric Research, Orangeburg, USA

Discussant

Rhoda Au
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Summary Abstract:
Neuropsychological test scores tap a number of underlying cognitive abilities. Examining the means by which omnibus scores are achieved provides considerable information regarding brain – behavior relationships and a richer context for clinical interpretation. This examination is the core tenant of the Boston Process Approach. Nonetheless, quantification of errors and process can be time consuming. However, the development of digital assessment technology is able to meet this challenge. For example, using a digital clock drawing test, previously unappreciated behaviors are now easily quantified and can dissociate between dementia and MCI subtypes. Research presented in this paper session provides additional insight into how digital technology can be leveraged as a powerful tool to capture behavior that, until recently, was either impractical or impossible to measure.
The assessment of graphomotor behavior can be challenging. In the context of a large-scale normative neuroimaging study, Colcombe and colleagues have engineered a digital Archimedes Spiral Test that includes measures of speed variability, rotational smoothness, and goodness of fit to the model. The temporal and spatial precision of these metrics is impressive. This research shows that, age predicted greater variable drawing speed, greater tracing errors, reduced rotational smoothness, and increasing drawing speed variability.
MacKay-Brandt and colleagues present data using a digital version of the Trail Making Tests (TMT), one of the most commonly administered neuropsychological tests. This research provides a panel of new parameters to evaluate TMT performance, including detailed speed

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metrics with spatial segregation to parse circle connection time from dwell time within a circle. Interestingly, dwell time, rather than traditional total time to completion, was the strongest predictor of differences between conditions and across age.
Baliga and colleagues present data on a protocol of novel cancellation tests. Memory clinic patients were classified into groups presenting with mild dementia, mild cognitive impairment, and those who were cognitively normal. Digital parameters of interest included correct responses, commissions, mean intra-response latency, and mean apple pencil touch. Using these parameters, significant between group differences were obtained. Moreover, logistic regression analyses were able to classify patients into their respective groups.
It is well understood that paragraph recall tests assess a variety of underlying cognitive abilities. Andersen and colleagues studied Logical Memory recall in the Long-Life Family Study and extracted linguistic parameters that included word count, grammatical features (e.g., prepositions), and content words related to specific categories (e.g., work). Participants were classified as cognitively normal or impaired. Analyses identified distinct linguistic features of free recall that predicted cognitive status.
Hershkovich and colleagues extract measured pauses and speech frequency behavior also from a paragraph recall test. A combination of paragraph recall pause duration, speech frequency parameters, and demographic variables were able to classify older adults with and without cognitive compromise. Collectively, the evidence provided in this series of papers demonstrates that digital platforms can capture and quantify highly nuanced neurocognitive behavior to enrich information available to researchers and clinicians for analysis and clinical formulations. Digital assessment technology holds promise to realize the vision of the Boston Process Approach and revolutionize neuropsychological assessment.
Keyword 1: assessment
Keyword 2: cognitive processing
Keyword 3: aging (normal)

95 Delving Beyond the Test Score: Linguistic Markers of Cognitive Impairment on Paragraph Recall

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Objective: Cognitive tests requiring spoken responses, such as paragraph recall, are rich in cognitive-related information that is not captured using traditional scoring methods. This study aimed to determine if linguistic features embedded in spoken responses may differentiate between individuals who are and are not cognitively impaired.
Participants and Methods: Participants in the Long Life Family Study completed a neuropsychological assessment which included the WMS-R Logical Memory I paragraph recall. For a subset of participants (N=709), test responses were digitally recorded and manually transcribed. We used Linguistic Inquiry Word Count, a text analysis program, to quantify word counts, grammatical features (e.g, prepositions, verb tenses), and the use of content words related to specific semantic categories (e.g., work-related, numbers) for immediate (IR) and delayed recall (DR). We used regression models with Generalized Estimating Equations adjusted by age, sex, education, and within-family correlation to select features associated with cognitive status (normal cognition [NC] versus cognitive impairment [CI]; Bonferroni-corrected threshold $p<0.001$). Next, we developed a "polyfeature score" (PFS) for both immediate and delayed recall, each calculated as a weighted sum of the selected linguistic features. We then built a logistic regression model to evaluate the predictive value of each PFS for identifying cognitively impaired individuals. In secondary analyses, we used regression models as above to identify features associated with mild cognitive impairment subtype (amnestic

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