Submission possibilities

<http://jnnp.bmj.com/> -Journal of Neurology, Neurosurgery, and Psychiatry – paper? Short report?

<http://www.alzheimersanddementia.com/> - Alzheimer’s and Dementia

Cortex

Both journals have published Moca/MMSE related things

Title of the article

Avital Sternin\*, Jessica A. Grahn, Adrian M. Owen

\* avital.sternin@uwo.ca

AS, JAG & AMO  
Brain and Mind Institute  
University of Western Ontario  
London, Ontario  
Canada  
N6A 3K7  
519 661 2111 x86057

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Abstract (250 words)

Assessing an individual’s cognitive capacity has become an increasingly large part of caring for the elderly. Cognitive capacity assessments are used to determine the level of care an individual requires and assessment results have legal implications for determining whether an individual is capable of making decisions about property and personal care. Full cognitive capacity assessments are difficult and time-consuming to administer. Shorter versions have been created that can be used to gain a snapshot understanding of an individual’s capacity and to follow cognitive health changes over long periods of time. Currently, the most widely used tests are the Mini-Mental State Exam (MMSE; Folstein, Folstein, & McHugh, 1975) and the Montreal Cognitive Assessment (MoCA; Nasreddine et al., 2005). Both the MMSE and the MoCA are paper-pencil tests that can be administered by a trained individual in under 10 minutes. The MMSE was developed in 1975 as an efficient way to routinely evaluate psychiatric patients (Folstein et al., 1975). Currently, the MMSE is most widely used in clinical and legal settings. However, the MoCA may well replace the MMSE as the gold-standard because it is freely available and recent work has shown the MoCA’s increased sensitivity for detecting mild cognitive impairment (Larner, 2012; Smith, Gildeh, & Holmes, 2007; Zadikoff et al., 2008). The ability to accurately detect cognitive impairment is extremely important for the appropriate care of our aging and elderly populations.

The MoCA and the MMSE are paper-and-pencil tests that determine the presence of cognitive impairment by comparing an individual’s score to a validated cut-off. One issue with these tests is an ambiguity in how to interpret scores that fall near or between the borderlines for an impaired or unimpaired diagnosis. Ambiguity in how to classify these scores can cause misdiagnosis of some individuals and result in inappropriate changes to their treatment. Recently, a computerized battery of three tests was able to differentiate 88% of individuals with borderline cognitive impairment as determined by the MoCA (Brenkel, Shulman, Hazan, Herrmann, & Owen, 2017). The scores on the computerized tests were used to categorize individuals who achieved an ambiguous score on the MoCA into the impaired or unimpaired categories indicating that this computerized test battery is capable of a more fine-grained classification of cognitive abilities.

In this study, we were interested whether a larger computerized battery of 12 tests would be able to differentiate more than 88% of individuals with ambiguous scores. We were also interested in determining how the computerized test battery would compare to the MMSE as well as the MoCA. Specifically, we were interested to see which subset of the computerized test battery tasks predicted MoCA and MMSE scores.

**METHODS**

**Subjects**

Participants were recruited from retirement homes and the general community. Participants over the age of 50 with the ability to provide informed consent were included in the study. Any participant who was unable to understand the instructions of the tasks was excluded. In total \_\_ participants (\_\_ female) participated in this study. The study was approved by the University of Western Ontario Research Ethics Board. All subjects gave written informed consent to participate.

**Procedure**

The computerized test battery (CBS battery) consisted of 12 different tasks. Details regarding these tasks can be found \_\_\_\_. These tasks were presented to participants on a tablet computer. Each of the tasks was preceded by instructions and practice trials. Researchers were on hand to offer any further clarification of instructions. Participants completed all 12 tasks in a random order and took as many breaks as necessary between tests to prevent fatigue. After the CBS task battery, a MoCA (version 7.1 English) and MMSE (Folstein et al, 1987) were administered on paper in interview format with a researcher. All MoCAs and MMSEs were administered by the same researcher. Participants also completed a demographic questionnaire on paper.

**RESULTS**

Summary of all scores/demographic info

Using CBS to categorize borderline MoCA scores – Brenkel 2017 replication

Why it doesn’t work with MMSE

Regression results

**DISCUSSION**

In general, another advantage of computerized test batteries is their consistent and reliable administration of tests to each participant. Without

**Acknowledgements**

Emily S. Nichols, Alexandra A. Pearce, Christie Gardens, CBS?

**Competing Interests**

The Cambridge Brain Sciences Battery was created by Professor Owen. Although he has an unrestricted academic license to use this software he stands to gain nothing financially (or otherwise) from its use in this research project. The software was developed in his lab, primarily for research purposes, and is being used currently in numerous academic research studies. There is no conflict of interest.

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