



Validation of the Medication Box Task Assessment

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INTRODUCTION

- Acquired brain injury (ABI) is an injury within the brain that occurs after birth and is unrelated to degenerative diseases or conditions. The most common causes are due to a traumatic brain injury (TBI) and cerebral vascular accident (CVA) (Brain Injury, 2015).
- There is a need for clinical assessments that can evaluate cognitive performance in relation to functional performance of everyday tasks for the ABI population (Hartman-Maeir, et al., 2009).
- Two types of cognitive assessments are used to assess the ABI population: tabletop and occupation-based assessments (Cooke et al, 2006).
- Tabletop assessments may indicate the overall cognition or a specific aspect of cognition through pen and paper tasks, such as answering questions or solving problems (Garcia-Molina et al., 2012).
- Occupation-based cognitive assessments, also known as performance-based assessments, measure cognition through a functional task, such as dressing, meal preparation, or medication management to assess an individual's cognition (Burgess et al., 2006).

Statement of Purpose

- This study aimed to validate the Medication Box Task assessment as an occupation-based cognitive assessment for individuals with ABI. A battery of gold standard tabletop assessments were used as criterion measurements against the Medication Box Task assessment.

LITERATURE

- Depending on the level of cognitive deficits, many individuals with ABI face challenges with functional performance in occupations. These cognitive impairments indicate a greater need for rehabilitation in recovering from these injuries (Hartman-Maeir, Harel, & Katz, 2009).
- For occupational therapists to provide client-centered care throughout the entire rehabilitation process, using an assessment that addresses occupational performance of cognition is imperative to functional outcomes (Burgess et al., 2006).
- Studies suggest that tabletop assessments are frequently used with individuals with ABI as a method to gain a snapshot of cognitive impairment. However, these assessments often lack ecological validity, meaning the assessment is unlikely to reflect predictability of an individual's occupational performance (Burgess et al., 2006; Cooke et al., 2006 ;Garcia-Molina et al., 2012).
- Occupation-based cognitive assessments possess greater ecological validity because they are particularly sensitive to executive dysfunction and the impact on functional performance of everyday activities, (Maeir, Krauss, & Katz, 2011). However, there is a limited number of assessments that have been validated for the population of ABI (Burgess et al., 2006; Maeir, Krauss, & Katz, 2011).
- Many occupation-based cognitive assessments can take up to an hour or more to complete as they intend to be as close to real life activity as possible and require the use of real life environments like kitchens and bedrooms (Cooke et al., 2006; Hartman-Maeir et al.,2009).
- Implementation of occupation-based cognitive assessments in practice may be limited by their infeasibility and time constraints in most clinical settings (Hartman-Maeir et al., 2009).

METHODOLOGY

Design

- Quantitative exploratory correlation study.

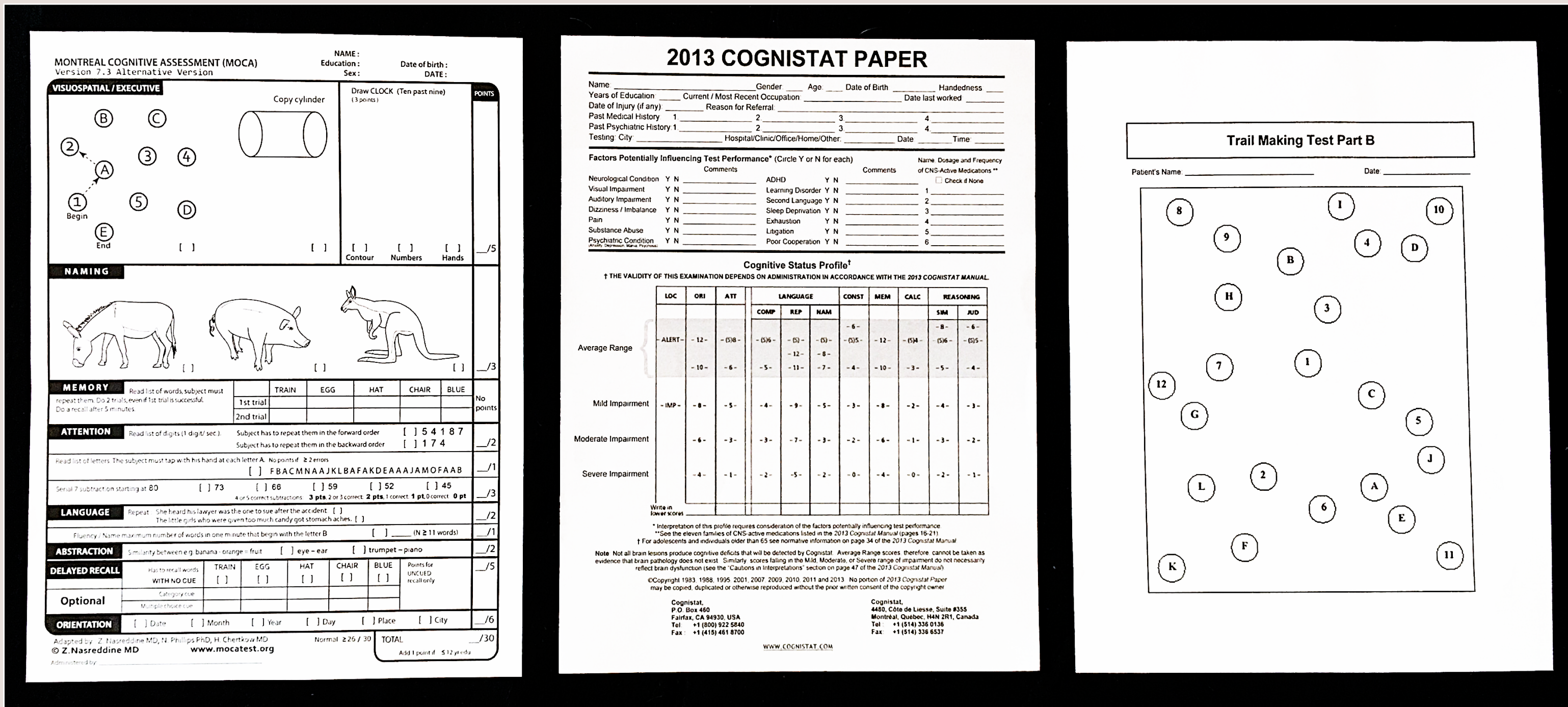
Participants

- Eight English speaking individuals over the age of 18 with CVA, TBI, or brain tumor.

Data Collection Procedure

- Three screening methods were used to determine eligibility: telephone interview, demographic survey, and a test of the individual's ability to open a medication bottle.
- The researchers administered five assessments in the same sequence: The Cognistat© (2013), Trail Making Test Part B, The Medication Box Task assessment, The Tower of London, and The Montreal Cognitive Assessment (MoCA©) (7.3).

Assessments



The Medication Box Task assessment is an occupation-based cognitive assessment that measures executive function. Prior to the start of the assessment, a dice is rolled by the administrator to determine the number of over-the-counter "distractor" bottles added to the assessment. Participants are given a pill organizer labeled for both morning and evening, five medication bottles with directions, and over-the-counter "distractor" bottles. Oral instructions are given once by the administrator, and the participant is handed written instruction for reference. After instruction is completed, the administrator steps away and leaves the participant to complete the task within a 20-minute time frame.

RESULTS

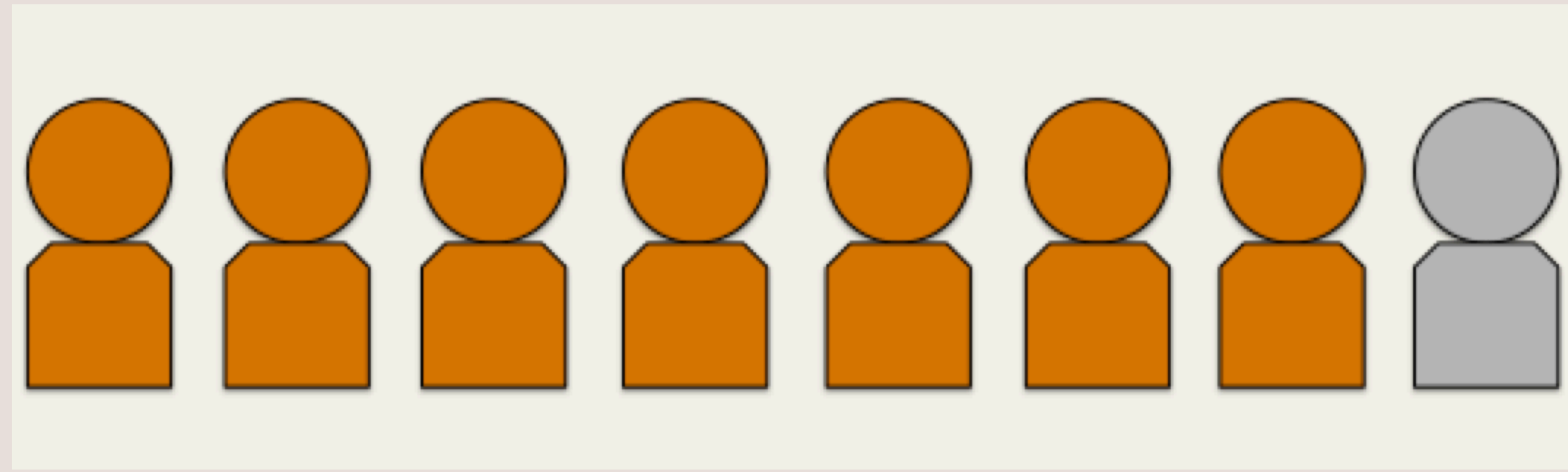
- Seven out of eight participants made errors on the Medication Box Task assessment.
- There is no significant correlation ($p=.06$, $r=.687$) between participants who managed their own medication and the number of errors made on the Medication Box Task assessment.
- Significant correlation was found between missing pills and extra pills of the Medication Box Task assessment and type II error of the Tower of London.

		MEDB TOTAL ERRORS	MEDB TIME	MEDB NUMBER OF DISTRAC TOR BOTTLES	MEDB OC MISTAKES	MEDB MISSIN G PILLS	MEDB EXTRA PILLS	MEDB TOTAL CORRECT
TOL Type II Error	Pearson Correlation	.178	.555	.036	-.397	.981**	.947**	-.951**
	Significance (2-Tailed)	.673	.195	.932	.330	.000	.000	.000
MoCA Total Score	Pearson Correlation	-.360	-.140	.147	-.468	.148	.272	-.224
	Significance (2-Tailed)	.381	.765	.729	.242	.726	.515	.594
TM Time	Pearson Correlation	.263	.147	-.720*	.398	-.333	-.164	.334
	Significance (2-Tailed)	.528	.753	.044	.329	.420	.698	.419
COG Total Score	Pearson Correlation	.439	-.393	.376	.370	-.001	.168	-.106
	Significance (2-Tailed)	.277	.383	.359	.367	.998	.691	.802

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed)

DISCUSSION

- Based on the results of this study, the Medication Box Task assessment may not have construct validity as an occupation-based cognitive assessment for individuals with ABI.
- Limitations of the study include a small sample size, recruitment from one agency, and only high functioning participants were recruited.



- Errors made on the Medication Box Task assessment by seven out of the eight participants may be an indication of a safety risk, since seven out of the eight participants reported to have managed their own medication.
- Significant correlations found between the subcomponents of scoring for the Tower of London and the Medication Box Task Assessment, suggests that the Medication Box may have potential to be useful in identifying impairments in executive functioning.
- In conclusion, the discovery of safety risks in medication management supports the need for efficient occupation-based cognitive assessments in the field of occupational therapy. The Medication Box Task assessment may be further developed to address this need in the population of ABI.