CLINICAL MANIFESTATIONS

PODIUM PRESENTATION

NEUROPSYCHOLOGY

Construct Validity Indicators from the ARMADA STUDY for the Tablet Computer-Based NIH Toolbox Cognition Battery

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Abstract

Background: The Advancing Reliable Measurement in Alzheimer's Disease and Cognitive Aging (ARMADA) study was designed to validate and further develop the full tablet-based NIH Toolbox Assessment of Neurological and Behavioral Function within an older, racially diverse sample. This ARMADA cohort study of the Toolbox Cognition Battery (NIHTB-CB) reports construct validity, assessed through its two components: convergent (high correlations to related constructs) and discriminant (low correlations with dissimilar constructs) validity.

Methods: Participants (age range 65–99 years, 142 aged 85+) were consensus conference-diagnosed with normal cognition (N = 367), amnestic mild cognitive impairment (N = 136), and Alzheimer's disease (N = 68). NIHTB-CB assesses domains of *Fluid Executive*, including Set Shifting (Dimensional Card Sort/DCCS), Inhibitory Control and Attention, (Flanker) and Working Memory (List Sort Working Memory/LSWM); *Fluid Processing Speed* (Pattern Comparison/PCPS), *Fluid Episodic Memory* (Picture Sequence Memory/PSM) and *Crystalized Language* (Oral Reading/ORR, Vocabulary/TPVT). Participants were also given the National Alzheimer's Disease Coordinating Center Unified Data Set (UDS3) cognitive measures: *Memory Composite* (Benson Figure and Craft Stories Delayed Recall); *Executive Composite* (Trail Making, Semantic Fluency), *Auditory Attention* (Digit Span Forward), *Figure Copy* (Benson), and *Language* (Multi-lingual Naming Test). Unadjusted, (uncorrected) standard scores were created based on the full Toolbox and UDS populations.

Result: Based on the large sample size, most all correlations between NIHTB-CD and UDS3 were significant, though patterns were clear. NIHTB-CB/Fluid Executive tests had highest correlations with the related UDS3 Executive factor composite (r = 0.53-0.60), approaching threshold for a "good" designation (>0.6), and "low" designation correlations (r<0.3) for Auditory Attention. PSM correlated highest with UDS Episodic Memory (r = 0.55), and lowest with Auditory Attention (r = 0.23). PCPS was highest with the Executive Composite (r = 0.53) and lowest with Language (r = 0.26). Crystal-

ized NIHTB-CB correlated highest with UDS Language ($r = 0.41$-0.50) versus ORR with Memory ($r = 0.22$) and TPVT with Copy ($r = 0.26$).

Conclusion: Results demonstrated that the highest correlations between NIHTB-CD and UDS3 measures were between related constructs and lowest correlations were between dissimilar constructs. Thus, convergent/discriminant expectations were supported across NIHTB-CB measures, reinforcing NIHTB-CB construct validity. Consistent results across diagnoses and other analytic approaches are also presented, supporting these findings.