

TEST-RETEST RELIABILITY OF A NEUROCOGNITIVE MOBILE APPLICATION IN HEALTHY ADULTS

Jose Miranda

College of Applied Studies
Applied Sciences Poster Presentation

Abstract: **PURPOSE:** This study tested the consistency and reliability of a neurocognitive mobile application to assess reaction time and cognitive function. Specifically, the test-retest reliability of the mobile application. **METHODS:** 49 healthy adults participated. Participation included 3 trials administered 7-10 days apart. Testing included 6 modules (i.e., Memory, Reverse Number Counting, Cued Stroop, Reaction Time, Impulse Control, Inspection Time) using a smartphone (iPhone 12 or Samsung 13) with the Sway Medical App, Version 5.5.6. Analysis was conducted on 39 subjects, $M = 23.38 + 1.36$, 56% female. Ten subjects were removed before analysis (1- known neurocognitive condition, 9 - missing data). **Summary of RESULTS:** A Repeated Measures ANOVA using Greenhouse-Geisser found no significant difference in main effect Trials, $F(1.698, 64.52) = 1.647$, $p = .204$, $np2 = .042$, observed Power .310, across the three assessments trial 1 ($M = 170.351 + SE = 4.386$), trial 2 ($M = 166.291 + SE = 4.529$), and trial 3 ($M = 164.453 + SE = 4.242$), respectively. No significant Trials x Modules Interaction, $F(2.578, 97.948) = 1.419$, $p = .245$, $np2 = .036$, observed Power .338 was found, however, the main effect for Modules was significant $F(1.376, 52.306) = 530.269$, $p = .000$, $np2 = .933$, observed Power 1.0. **CONCLUSION:** Despite a lack of statistical power, the Sway neurocognitive mobile app demonstrated test-retest reliability in this study. The gradual decline in mean scores across trials, although not significant, may indicate an apparent learning effect when using this tool requiring further investigation. The significant finding across Modules, however, was anticipated because Module is an individualized test intended to assess a specific cognitive or reaction time measure. In conclusion, the Sway Mobile App may serve as a viable cognitive assessment tool, however, reliability testing on each individual assessment module along with reliability testing on other age groups and populations is needed.

Faculty Mentor: *Heidi Bell*