

independent of eye movements. In a subset of 182 ischemic stroke patients, we also assessed visuoconstruction (Copy Rey-Complex Figure Test), visual emotion recognition (FEEST test) and visual memory (Doors-test).

Results: The results showed that deficits in motion-perception were most prevalent (26%), followed by colour (22%), texture (22%), location (21%), orientation (18%), contrast (14%), shape (14%) and glossiness (13%). 63% of the stroke patients showed one or more mid-range visual deficits. Overlap of deficits was small; they mostly occurred in isolation or co-occurred with only one or two other deficits. Impairments in mid-range visual functions could not predict performance on higher-order visual cognitive tasks. Impaired visuoconstruction and visual memory were only modestly predicted by a worse location perception. Impaired emotion perception was modestly predicted by a worse orientation perception. In addition, double dissociations were found: there were patients with selective deficits in 'mid-range' visual functions without higher-order visual deficits and vice versa.

Conclusions: First, deficits in "mid-range" visual functions are very prevalent. Since we found no strong patterns of co-occurrences, we suggest that an assessment of deficits at this level of visual processing requires screening the full range of visual functions. Second, the relationship between mid-range visual tasks and higher-order visual cognitive tasks is weak. Finally, our findings are not supportive of the hierarchical, two-pathway model but more in line with an alternative patchwork model.

Categories:

Assessment/Psychometrics/Methods (Adult)

Keyword 1: stroke

Keyword 2: visuospatial functions

Keyword 3: memory disorders

Correspondence: Edward de Haan, University of Amsterdam, e.h.f.dehaan@uva.nl

15 Exploratory Factor Analysis of Cognitive and Positive Valence Measures for the RDoC

Emily T Sturm¹, John R Duffy¹, Anastasia G Sares¹, Andrea Mendez-Colmenares¹, Lauren Sarabia², Eve Delao², Max Henneke¹, Raana

Manavi¹, Donald C Rojas¹, Jason R Tregellas², Jared W Young³, Michael L Thomas¹
¹Colorado State University, Fort Collins, CO, USA. ²University of Colorado Anschutz Medical Campus, Aurora, CO, USA. ³University of California San Diego, San Diego, CA, USA

Objective: As part of the Research Domain Criteria (RDoC) initiative, the NIMH seeks to improve experimental measures of cognitive and positive valence systems for use in intervention research. However, many RDoC tasks have not been psychometrically evaluated as a battery of measures. Our aim was to examine the factor structure of 7 such tasks chosen for their relevance to schizophrenia and other forms of serious mental illness. These include the n-back, Sternberg, and self-ordered pointing tasks (measures of the RDoC cognitive systems working memory construct); flanker and continuous performance tasks (measures of the RDoC cognitive systems cognitive control construct); and probabilistic learning and effort expenditure for reward tasks (measures of reward learning and reward valuation constructs).

Participants and Methods: The sample comprised 286 cognitively healthy participants who completed novel versions of all 7 tasks via an online recruitment platform, Prolific, in the summer of 2022. The mean age of participants was 38.6 years (SD = 14.5, range 18-74), 52% identified as female, and stratified recruitment ensured an ethnographically diverse sample. Excluding time for instructions and practice, each task lasted approximately 6 minutes. Task order was randomized. We estimated optimal scores from each task including signal detection d-prime measures for the n-back, Sternberg, and continuous performance task, mean accuracy for the flanker task, win-stay to win-shift ratio for the probabilistic learning task, and trials completed for the effort expenditure for reward task. We used parallel analysis and a scree plot to determine the number of latent factors measured by the 7 task scores. Exploratory factor analysis with oblimin (oblique) rotation was used to examine the factor loading matrix.

Results: The scree plot and parallel analyses of the 7 task scores suggested three primary factors. The flanker and continuous performance task both strongly loaded onto the first factor, suggesting that these measures are strong indicators of cognitive control. The n-back,

Sternberg, and self-ordered pointing tasks strongly loaded onto the second factor, suggesting that these measures are strong indicators of working memory. The probabilistic learning task solely loaded onto the third factor, suggesting that it is an independent indicator of reinforcement learning. Finally, the effort expenditure for reward task modestly loaded onto the second but not the first and third factors, suggesting that effort is most strongly related to working memory.

Conclusions: Our aim was to examine the factor structure of 7 RDoC tasks. Results support the RDoC suggestion of independent cognitive control, working memory, and reinforcement learning. However, effort is a factorially complex construct that is not uniquely or even most strongly related to positive valance. Thus, there is reason to believe that the use of at least 6 of these tasks are appropriate measures of constructs such as working memory, reinforcement learning and cognitive control.

Categories:

Assessment/Psychometrics/Methods (Adult)

Keyword 1: cognitive control

Keyword 2: working memory

Keyword 3: effort testing

Correspondence: Emily T. Sturm, Colorado State University, emily.sturm@colostate.edu

16 Validation of the Pillbox Test in a Veteran Sample: A Replication Study.

Frances M. Bozsik¹, Timothy J. Arentsen^{1,2}, Brad L. Roper^{1,2}, Jessica M. Fett¹, Marcy C. Adler^{1,2}, Jennifer L. Jacobson¹, Charlotte Bayer¹
¹Memphis VA Medical Center, Memphis, TN, USA. ²University of Tennessee Health Science Center, Memphis, TN, USA

Objective: Assessment of medication management, an instrumental activity of daily living (IADL), is particularly important among Veterans, who are prescribed an average of 25-40 prescriptions per year (Nguyen et al., 2017). The Pillbox Test (PT) is a brief, performance-based measure that was designed as an ecologically valid measure of executive functioning (EF; Zartman, Hilsabeck, Guarnaccia, & Houtz, 2013), the cognitive domain most predictive of successful medication

schedule management (Suchy, Ziemnik, Niermeyer, & Brothers, 2020). However, a validation study by Logue, Marceaux, Balldin, and Hilsabeck (2015) found that EF predicted performance on the PT more so than processing speed (PS), but not the language, attention, visuospatial, and memory domains combined. Thus, this project sought to increase generalizability of the latter study by replicating and extending their investigation utilizing a larger set of neuropsychological tests.

Participants and Methods: Participants included 176 patients in a mixed clinical sample (5.1% female, 43.2% Black/African American, 55.7% white, $M_{age} = 70.7$ years, $SD_{age} = 9.3$, $M_{edu} = 12.6$ years, $SD_{edu} = 2.6$) who completed a comprehensive neuropsychological evaluation in a VA medical center. All participants completed the PT where they had five minutes to organize five pill bottles using a seven-day pillbox according to standardized instructions on the labels. Participants also completed some combination of 26 neuropsychological tests (i.e., participants did not complete every test as evaluations were tailored to disparate referral questions). Correlations between completed tests and number of pillbox errors were evaluated. These tests were then combined into the following six domains: language, visuospatial, working memory (WM), psychomotor/PS, memory, and EF. Hierarchical multiple regression was completed using these domains to predict pillbox errors.

Results: Spearman's correlation coefficients indicated that 25 tests had a weak to moderate relationship with PT total errors ($r_s = 0.23 - 0.51$); forward digit span was not significantly related ($r_s = 0.13$). A forced-entry multiple regression was run to predict PT total errors from the six domains. The model accounted for 29% of the variance in PT performance, $F(6, 169) = 11.56$, $p < .001$. Of the domains, psychomotor/PS made the greatest contribution, $t(169) = 2.73$, $p = .007$, followed by language, $t(169) = 2.41$, $p = .017$, and WM, $t(169) = 2.15$, $p = .033$. Visuospatial performance and EF did not make significant contributions ($p_s > .05$). Next, two hierarchical multiple regressions were run. Results indicated that EF predicted performance on the PT beyond measures of PS, $\Delta R^2 = .02$, $p = .044$, but not beyond the combination of all cognitive domains, $\Delta R^2 = .00$, $p = .863$.

Conclusions: Results of this study partially replicated the findings of Logue et al. (2015). Namely, EF predicted PT performance beyond PS, but not other cognitive domains. However,