

preliminary performance metrics including speed, accuracy, and variability are reported.

Results: Preliminary data include 12 participants from the NKI-RS2 study ranging in age from 11-75 years ($M = 52.83$, $SD = 19.97$); 67% female. Overall participants took longer to complete condition B ($M_B = 51.71$ secs) compared to condition A ($M_A = 23.07$ secs), $p = 0.0005$. Connections were made more slowly ($M_A = 37.47$ secs vs. $M_B = 24.50$ secs, $p < 0.001$) and connection speed was more variable ($CV_A = 0.90$ vs. $CV_B = 1.22$, $p < 0.01$) on condition B versus A. Connection speed decreased and speed variability increased with age ($t[11] = -3.25$, $p = 0.05$, $t[11] = -3.63$, $p < 0.01$, respectively). Time spent within circles (dwell time) was significantly greater in B versus A ($t[11] = 6.81$, $p < 0.001$). Number of errors were limited ($M_A = .89$ and $M_B = 1.0$, range 0-2 in both tests) with no difference between tests or effects of age (both $ps > 0.05$).

Conclusions: These preliminary data from the NKI-RS2 normative neuroimaging study demonstrate that a digitized version of a classic neuropsychological test is feasible across a diverse range of community participants, and replicates known age effects. The advantages of growing access to these DCA tools and the shared data resources they will produce has the potential to revolutionize neuropsychological research and clinical practice.

Categories: Teleneuropsychology/ Technology

Keyword 1: assessment

Keyword 2: cognitive processing

Keyword 3: aging (normal)

Correspondence: Anna MacKay-Brandt, Nathan Kline Institute for Psychiatric Research, anna.mackay-brandt@nki.rfmh.org

94 Digitized Archimedes Spiral Drawing in the NKI-Rockland Sample

Stan Colcombe, Anna MacKay-Brandt, Ava Waters, Sarah Abdelaziz, Nora Liu
Nathan Kline Institute for Psychiatric Research, Orangeburg, NY, USA

Objective: Digital cognitive assessments (DCAs) provide insight into cognition and behavior that remains inaccessible through standard assessment approaches. However, the availability of DCAs and the requisite toolkits

to extract and analyze meaningful features from these datasets are largely constrained to technical specialists or through fee-for-service commercial entities. The NKI-Rockland Sample provides a large-scale lifespan data sample featuring DCAs, and also openly shares its DCA tasks through the open-source MindLogger platform along with pipelines for feature extraction and analyses. Here we present normative performance from a digital version of Archimedes Spiral Drawing.

Participants and Methods: NKI-RS2 participants were largely drawn from the existing NKI-RS participant pool ($n = 1,500$), aged 8-85. The NKI-RS2 is in year 1 of data collection; here, we report on a subset of participants ($n = 9$) who performed a digitized version of the Archimedes Spiral Drawing task. This graphomotor task with well-established research and clinical utility in movement disordered populations was adapted for use for off-the-shelf tablet devices. The NKI-RS2 implements these tasks on an Apple iPad Pro2, sampling participant drawing at 120Hz, and featuring pixel- and millisecond-level resolution for all tasks. On the Spiral Drawing and Recall Tests participants traced five Archimedes spirals from the center outward through four windings presented on the iPad. They were then asked to replicate the spiral freehand three times. From these spiral drawings, we extracted time to completion, distance covered, speed/ speed variability, rotational smoothness, number of crossings, mean absolute error, bias, and goodness of fit to the ideal Archimedes spiral.

Results: Comparing the tracing and recall conditions, participants showed significantly faster drawing speed ($t[8] = 5.32$, $p < .001$), more variable drawing speed ($t[8] = 5.93$, $p < .001$), reduced goodness of fit to the template ($t[8] = 4.99$, $p < .002$), and reduced rotational smoothness ($t[8] = 7.43$, $p < .0003$) in the recall conditions. Collapsing across conditions, age predicted more variable drawing speed: $t[8] = 2.77$, $p < .019$, greater tracing error ($t[8] = 2.69$, $p < .0227$), and reduced rotational smoothness ($t[8] = 2.67$, $p < .024$). Between conditions, age predicts a greater increase in drawing speed variability ($t[8] = 9.76$, $p < .0006$).

Conclusions: Using the open source MindLogger platform and off-the-shelf digital tablets, we were able to replicate classic paper and pen neuropsychological tests. By adapting these tasks to DCA, we were able to extract meaningful features that are not otherwise accessible (drawing speed, variability, etc.), or

that would require additional hardware solutions (e.g., dwell time). By making these tasks and their processing pipelines available, the NKI-RS2 can facilitate the democratization of DCA and DCA analysis to a broader range of researchers and clinicians.

Categories: Teleneuropsychology/ Technology

Keyword 1: assessment

Keyword 2: cognitive processing

Keyword 3: aging (normal)

Correspondence: Stan Colcombe, Nathan Kline Institute for Psychiatric Research, stan.colcombe@nki.rfmh.org

Poster Symposium: Digital Neuropsychology in Perspective: Are we 'Clinically' there yet?

Chair

Lucia Crivelli
Fleni, Buenos Aires, Argentina

Discussant

Preeti Sunderaraman
Boston University School of Medicine, Boston, USA

Summary Abstract:

Traditionally, neuropsychology has focused on assessing aspects of the brain and behavior using in-person, paper-and-pencil tests. There was a heavy emphasis on the standardization of test procedures and use of psychometrically sound norms to enable precise clinical evaluations and diagnosis. In the past few decades, the advent of digital technology has led to an increased focus on teleneuropsychology, which consists of conducting evaluations remotely. The coronavirus (COVID) pandemic propelled teleneuropsychology to new heights as it became increasingly recognized that cognitive evaluations conducted via technology can be both a feasible and practical approach to understanding the brain. However, with this realization, it also became apparent that teleneuropsychology tests and procedures need to be updated to keep pace with the contextual

changes. In keeping with this need the current symposium includes four abstracts covering a range of topics relevant to improve our understanding of the future of teleneuropsychology and its emergent clinical applications. The first abstract focuses on providing the audience with a scoping review of the literature about the current state of teleneuropsychology following the COVID pandemic. The second abstract focuses on providing evidence for the feasibility of conducting cognitive assessments remotely along with providing construct validity for the tasks. The third abstract discusses a rapid approach to test development, piloting, translation to clinical use, and adaptation for other languages and cultures using a unique platform. Finally, the last abstract focuses on improving our understanding of a Hybrid Neuropsychology model that integrates various digital tools for neuropsychological use that is being implemented in a clinical setting.

Keyword 1: psychometrics

Keyword 2: neuropsychological assessment

Keyword 3: teleneuropsychology

97 Looking in the Webcam Reflection: A Scoping Review of Videoconferencing-Based Teleneuropsychological Assessment Since the Start of the COVID-19 Pandemic

Joshua T Fox-Fuller^{1,2}, Preeti Sunderaraman^{3,4}, C. Munro Cullum⁵, Yakeel T. Quiroz⁶

¹Boston University Department of Psychological and Brain Sciences, Boston, MA, USA. ²Emory University School of Medicine, Atlanta, GA, USA. ³Boston University School of Medicine, Department of Neurology, Boston, MA, USA.

⁴The Framingham Heart Study, Framingham, MA, USA. ⁵University of Texas Southwestern Medical Center Departments of Psychiatry, Neurology, and Neurological Surgery, Dallas, TX, USA. ⁶Massachusetts General Hospital Departments of Psychiatry and Neurology, Boston, MA, USA

Objective: Following the start of the SARS-COV-2 (COVID-19) pandemic there was a rapid