Controlled Oral Word Association (COWA) test, category fluency ('animals')). Pearson Product Moment Correlations were used to assess the linear relationships between pauses and speech frequency categories and neuropsychological metrics.
Results: Neuropsychology metric classification using -1SD cut-off identified 27% (18/67 participants) as Cognitively Compromised. The Cognitively Compromised group and the Cognitively Well group did not show any difference in distributions of individual pause/frequency features (Mann Whitney U-test, p> 0.11). A negative correlation was found between total duration of short pauses and HVLT total immediate free recall, while a positive correlation was found between MFCC-10 and HVLT total immediate free recall. The best classification model was AdaBoost Classifier which predicted the Cognitively Compromised label with 0.91 area under receiver operating curve, 0.81 accuracy, 0.43 sensitivity, 1.0 specificity, 1.0 precision, 0.6 f1 score.
Conclusions: Pause characteristics and frequency profiles of speech immediately following pauses from a paragraph memory test accurately identified older adults with compromised cognition, as measured by verbal learning and verbal fluency metrics. Furthermore, individuals with reduced HVLT immediate free recall generated more pauses, while individuals who recalled more words had higher power in mid-frequency bands (10th MFCC). Future research needs to replicate how paragraph recall pause characteristics and frequency the profile of speech immediately following pauses potentially provides a low resource alternative to automatic speech recognition models for detecting cognitive impairments.

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93 Digitized Trail Making Test in the NKI-Rockland Sample Normative Lifespan Neuroimaging Study

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Objective: Digitized cognitive assessment captures rich behavioral information that remains unmeasured using conventional methods. Data capture tools recently accessible only in specialized laboratories are now feasible at scale using off-the-shelf tablet devices. This study aims to share data from a digitized cognitive assessment embedded in an open-science research program collecting extensive neuroimaging, health, behavioral, neuropsychological, and psychiatric characterizations to advance translational cognitive neuroscience. In this research we present normative performance metrics from a digital version of the Trail Making Test.
Participants and Methods: The NKI-Rockland Sample (NKI-RS) has provided a model for openly-shared lifespan normative neuroimaging resources contributed by a community-ascertained sample (n=1,500, aged 6-85) and generating over 400 publications across diverse research areas. The next generation NKI-RS study (recruitment target= 600, aged 9-75) aims to enrich these resources for brain-behavioral research, normative reference, and biomarker discovery. One focus of innovation is the inclusion of digitized cognitive assessments (DCAs) utilizing an open-resource task development and data collection platform (Mindlogger, Child Mind Institute). We present preliminary data from a digitized version of the Trail Making Tests and report early descriptive metrics. The TMTs was administered via an iPad Pro using an Apple pen as part of a laboratory-based EEG procedure. The TMTs follows standard administration instructions, including a practice sample before each test condition. Error feedback is included in the task implementation such that an incorrect connection is marked with an "x" and the participant is directed to the last correct circle to continue. Feedback is automated within the task. Pixel-level spatial resolution and millisecond timing is captured across all drawing tasks. Task design, implementation, and

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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 (MA = .89 and MB = 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
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94 Digitized Archimedes Spiral Drawing in the NKI-Rockland Sample

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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

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