(mCAPP), to remotely detect cognitive changes associated with aging and preclinical Alzheimer's Disease (AD).

Participants and Methods: The mCAPP includes three gamified tasks: (1) a memory task that includes learning and matching hidden card pairs and incorporates increasing memory load, pattern separation features (lure vs. non-lure), and spatial memory (2) a stroop-like task ("brick drop") with speeded word and color identification and response inhibition components and (3) a digit-symbol coding-like task ("space imposters") with increasing pairs and incidental learning components. The cohort completed the NACC UDS3 neuropsychological battery, selected NIH Toolbox tasks, and additional cognitive testing sensitive to pre-clinical AD, within six months of the mCAPP testing. Participants included thirty-seven older adults (60% female; age=72±4.4, years of education=17±2.5; 67% Caucasian, 30% Black/AA, 3% Multiracial) with normal cognition who are enrolled in the Penn Alzheimer's Disease Research Center (ADRC) cohort. Participants completed one in-person session and two weeks of at-home testing, with eight scheduled sessions, four in the morning and four in the afternoon. Participants also completed questionnaires and an interview about technology use and wore activity trackers to collect daily step and sleep data and answered questions about mood, anxiety, and fatigue throughout the two weeks of at-home data collection.

Results: The participants completed an average of 11 at-home sessions, with the majority choosing to play extra sessions. Participants reported high usability ratings for all tasks and the majority rated the task difficulty as acceptable. On all mCAPP tasks, participant performance declined in accuracy and speed with increasing memory load and task complexity. mCAPP tasks correlated significantly with paper and pencil measures and several NIH Toolbox tasks (p<0.05). Examination of performance trends over multiple sessions indicates stabilization of performance within 4-6 sessions on memory mCAPP measures and 5-7 sessions on executive functioning mCAPP measures. Preliminary analyses indicate differences in mCAPP measures and imaging biomarkers.

Conclusions: Participants were willing and able to complete at-home cognitive testing and most chose to complete more than the assigned sessions. Remote data collection is feasible and well-tolerated. We show preliminary construct validity with the UDS3 and NIH Toolbox and test-retest reliability following a period of task learning and performance improvement and stabilization. This work will help to advance remote detection and monitoring of early cognitive changes associated with preclinical AD. Future directions will include further evaluation of the relationships between mCAPP performance, behavioral states, and neuroimaging biomarkers as well as the utility of detection of practice effects in identifying longitudinal change and risk for ADRD-related cognitive decline.

Categories: Teleneuropsychology/ Technology
Keyword 1: teleneuropsychology
Keyword 2: technology
Keyword 3: aging disorders
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99 Validation and clinical translation of a remote self-administered cognitive measure and models for cultural and linguistic adaptations through Mayo Test Drive

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Objective: Despite significant recent advances in test development in research settings, neuropsychological tests and normative data used in clinical settings have fallen behind in innovation in terms of empiricism and modality of administration (Bilder & Reise, 2019). Most widely-used test paradigms were initially developed 50-150 years ago with normative data that is often limited to White American-born monolingual English samples (Pugh et al., 2022; Rabin et al., 2016). Few digital tests have successfully translated into clinical use (Collins & Riley, 2016).

Participants and Methods: Mayo Test Development through Rapid Iteration, Validation, and Expansion (Mayo Test Drive) is a remote platform for neuropsychological test development and self-administration that is accessible through any web-based device (Stricker et al., 2022). To date, we have demonstrated rapid validation and clinical

translation of the SLS in native English speaking older adults and are now beginning cultural/linguistic adaptation for further validation, and clinical translation for Spanish speakers. Mayo Test Drive's web-based platform captures all item-level data to allow future item level analysis and application of machine learning techniques.

Results: The broader aim of Mayo Test Drive is to provide infrastructure to include more tests, adaptations, and normative datasets to ultimately improve access and utility for diverse patient populations. Mayo Test Drive currently includes two measures: Stricker Learning Span (SLS), a novel learning and recognition memory test, and Symbols Test, an open access processing speed measure (Stricker et al., 2022; Wilks et al., 2022). The SLS was designed with consideration of learning principles from cognitive neuroscience to enhance detection of the early decline in learning observed in preclinical Alzheimer's disease (AD). The SLS uses computer adaptive testing to adapt task difficulty trial-by-trial (e.g., increasing word span) and uses a sensitive 4-choice format to test recognition memory for each word. The SLS underwent initial piloting in older females to determine psychometric properties, test-retest reliability, convergent validity with traditional measures, and criterion validity (e.g., neuroanatomical associations).

Conclusions: Further validation and normative data development in the Mayo Clinic Study of Aging is ongoing, with additional criterion validation assessed by comparing brain PET (amyloid and tau) biomarker positive vs. negative groups. The SLS is equivalent to an in-person memory measure (AVLT), and the Mayo Test Drive composite including SLS and Symbols is superior to an in-person global screen (Short Test of Mental Status, like the MMSE) in distinguishing biomarker +/- older adults. To adapt the SLS for other languages/cultures, we have added community-based components to development (e.g., cognitive interviewing, additional piloting). We are beginning data-driven linguistic and remote cognitive interviewing approaches to develop an adaptation of the SLS for Spanish speakers. This study involves virtual focus groups with native Spanish speakers from different backgrounds (e.g., countries of origin, multilingualism) to examine the test paradigm, instructions, and items. Following piloting of the adaptations, next steps include normative data collection and clinical implementation. Future

work involves in-person adaptation studies for lower/middle income countries including a collaboration with a Master's level psychology graduate program in Grenada, West Indies to complete cognitive interviewing and pilot work with community members and stakeholders.

Categories: Teleneuropsychology/ Technology
Keyword 1: diversity
Keyword 2: neuropsychological assessment
Keyword 3: cognitive functioning
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100 Hybrid Neuropsychology in practice: Preliminary data and future directions

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Objective: The dynamic transitions towards and away from digitizing mental health care services have put immense pressure on neuropsychology to develop a more technologically advanced approach to patient care. Consistent with this, neuropsychologists are faced with an increasing burden to rapidly learn novel techniques of administering digital and/or remote cognitive measures, which may not be sufficiently standardized and/or psychometrically validated.

Participants and Methods: The Hybrid Neuropsychology model, which aims to provide a framework for the integration of digital tools in neuropsychological assessment, has been incorporated routinely in our clinical practice, and among diverse clinical populations in inpatient and outpatient settings.

Results: This talk aims to 1) provide a brief background on Hybrid Neuropsychology; 2) discuss preliminary findings from our ongoing studies implementing this approach in clinical populations; and 3) offer key insights gleaned from methodological, analytical, and practical perspectives.

Conclusions: Future work towards building a more integrative method of data collection and storage based on extant preliminary data will also be discussed.

Categories: Teleneuropsychology/ Technology
Keyword 1: cognitive functioning