

controls were assessed on the REASmash. They were instructed to find a target mole presented amongst distractor moles. The stimulus array consisted of a grid of 6 columns and 4 rows of molehills, from which the target and 11, 17 and 23 distractors moles could randomly appear, in two search conditions (single feature condition and saliency condition). Responses were made with the ipsilesional hand for individuals with stroke and with the dominant hand for the healthy controls. Participants were evaluated also with two standardized clinical tests of attention; the hearts cancellation task of the Oxford Cognitive Screen, and the visual scanning subtest of the Test for Attentional Performance.

Results: Validation results showed significant and strong correlations between the REASmash and the two reference tests, with the REASmash showing high sensitivity and specificity (i.e., the correct identification of the post-stroke vs. control individuals). The REASmash also showed significant and strong test/re-test reliability. We additionally evaluated user experience using the UEQ, and the results showed excellent attractiveness and novelty, and good stimulation and efficiency.

Conclusions: In conclusion, the REASmash is a novel immersive virtual environment serious game that is valid, sensitive, and usable. It provides a new diagnosis measure spatial and non-spatial attention impairment.

Categories: Teleneuropsychology/ Technology

Keyword 1: stroke

Keyword 2: computerized neuropsychological testing

Keyword 3: neglect

Correspondence: Khawla AJANA PSY-NAPS Group Psychological Sciences Research Institute (IPSY), Université Catholique de Louvain. Email address: khawla.ajana@uclouvain.be

89 Performance and Usability of a Remote App-Based Assessment of Cognition Among Older Adult Mobile Game Players and Non-Players

Kimberly Halberstadter, La'cendria Pulley, Rachel Rovere, Michael Dicalogero, David Wolk, Dawn Mechanic-Hamilton

University of Pennsylvania, Philadelphia, PA, USA

Objective: Mobile, valid, and engaging cognitive assessments are essential for detecting and tracking change in research participants and patients at risk for Alzheimer's Disease and Related Dementias (ADRDs). The mobile cognitive app performance platform (mCAPP) includes memory and executive functioning tasks to remotely detect cognitive changes associated with aging and preclinical Alzheimer's disease. This study assesses participants' comfort and subjective experiences with mCAPP as the potential utility and advantage of mobile app-based assessments for remote monitoring among older adults will depend upon usability and adoptability of such technology.

Participants and Methods: The mCAPP includes three gamified tasks: (1) a memory task involving learning and matching hidden card pairs ("Concentration") (2) a stroop-like task ("Brick Drop"), and (3) a digit-symbol coding-like task ("Space Imposters"). Participants included 37 older adults (60% female; age=72±4.4; years of education=17±2.5; 67% White) with normal cognition enrolled in the Penn ADRC cohort. Participants completed one baseline session of mCAPP in-person, followed by two weeks of at-home use with eight scheduled sessions. Information on prior experience with mobile technology and games was collected, and usability of mCAPP was measured at baseline and after 2-weeks of use with the IBM Computer Usability Satisfaction Questionnaire and the mHeath App Usability Questionnaire (MAUQ) respectively. Feedback on perceived difficulty, enjoyment, and likelihood to play mCAPP games again on their own was collected.

Results: Participants completed on average 11±4.9 sessions over 2 weeks, with each session lasting 11.5±2.5 minutes. 59% of participants reported using their mobile device to play games ("mobile game players"). Performance on mCAPP tasks was slower at baseline for non-players, with trend-level differences on higher-load blocks of Space Imposters (p=.057 and .059). No differences in game performance were seen between groups after playing 8 sessions at-home. There were no differences in usability of mCAPP between groups, with average usability 8.2±1.5 (IBM, 0-9 scale) at T1 and 6.2±0.8 (MAUQ, 1-7 scale) after completion of two weeks of at-home use

(TLast). Reported enjoyment was moderate to high for both groups at baseline and increased over time. Likelihood to play Concentration and Brick Drop again trended lower among non-players at T1 ($p=.061$ and $.054$), but not at TLast. Further, change in likelihood to play mCAPP from T1 to TLast was positive among non-players, with change for Concentration significantly higher for non-players than for players ($p=.037$).

Conclusions: Participants were willing and able to complete at-home cognitive testing and most completed more than the assigned sessions. While participants who do not play games on their own mobile device were slower on some tasks at baseline, these differences dissipated with further play at-home. Usability and enjoyment of mCAPP games were high regardless of mobile game-playing status, and non-players demonstrated increased willingness to play mCAPP games again at the end of participation compared to baseline. This pilot study shows preliminary feasibility and adoptability of mobile app-based assessment regardless of prior experience with mobile games.

Categories: Teleneuropsychology/ Technology

Keyword 1: computerized neuropsychological testing

Keyword 2: cognitive functioning

Keyword 3: neuropsychological assessment

Correspondence: Kimberly Halberstadter, University of Pennsylvania, kimberly.halberstadter@penmedicine.upenn.edu

90 Feasibility of Repeated Remote Memory Assessment with Mobile Devices to Detect Subtle Cognitive Decline in Older Adults

Lindsay R Clark^{1,2}, David Berron³, Amanda J Peterson¹, Kristin Basche¹, Samantha Allison⁴, Sterling C Johnson^{1,2}, Emrah Duzel^{3,5}

¹University of Wisconsin School of Medicine and Public Health, Madison, WI, USA. ²William S Middleton Memorial Veterans Hospital, Madison, WI, USA. ³German Center for Neurodegenerative Diseases (DZNE), Magdeburg, Germany. ⁴Intermountain Neurosciences Institute, Murray, UT, USA.

⁵Institute for Cognitive Neurology and Dementia Research, Univ. of Magdeburg, Magdeburg, Germany

Objective: Frequent and remote cognitive assessment may improve sensitivity to subtle cognitive decline associated with preclinical Alzheimer's disease (AD). The objective of this study was to evaluate the feasibility and acceptability of repeated remote memory assessment in late middle-aged and older adults.

Participants and Methods: We recruited participants from a longitudinal aging cohort to complete three medial temporal lobe-based memory paradigms (Object-In-Room Recall [ORR], Mnemonic Discrimination for Objects and Scenes [MDT-OS], Complex Scene Recognition [CSR]) using the neotiv application at repeated intervals over one year. We conducted initial telephone calls to perform screening, consent, and download instructions. Participants were assigned 24 remote sessions on a smartphone or tablet and were alerted via push notification when an assignment was ready to complete. Participants were randomly assigned to: (1) complete memory tests every other week or (2) complete memory tests for multiple days within one week every other month. Each remote session lasts approximately 10 minutes and includes one memory paradigm and brief usability/acceptability questionnaires followed by a delayed retrieval session 90 minutes later. Feasibility metrics examined included participation, retention, compliance, and usability/acceptability.

Results: Of 150 participants recruited, 113 consented and were enrolled into the study (participation rate = 75%). Current retention rate is 75%, with 85/113 currently active ($n=73$) or completed ($n=12$). Of the 85 active or completed participants, the mean age is 68.7 (range = 48-82), 64% are women, 70% used a smartphone (30% tablet), 84 are cognitively unimpaired and 1 has mild cognitive impairment. The primary threat to retention was participants consenting into the study but never registering in the app or completing their first scheduled assignment. After enrollment, 130 telephone calls were made by study staff to facilitate registration into the app or to remind participants to complete tasks. 74-80% of participants completed delayed retrieval tasks within 30 minutes of push notification, but average retrieval time was 125-137 minutes post-learning trials. Regarding