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Remotely administered computerized cognitive test battery using video chat and automated scoring

Computerized cognitive assessments are an efficient and sensitive method of identifying cognitive impairments in brain-injured and aging populations. The current study examines the feasibility and reliability of remote testing with a new tool, the California Cognitive Assessment Battery (CCAB). The CCAB runs on a remote tablet platform and includes telemedical interaction with an examiner via video chat. Examiners administer a comprehensive set of cognitive tests including, verbal, visual, memory, and processing speed tasks, as well as psychological questionnaires. The tasks are scored automatically, including consensus automated speech recognition (CASR) for the transcription of responses on verbal tasks (e.g., list-learning memory tasks, picture description, verbal fluency). For the current study, the CCAB was administered remotely to 185 healthy older adults (aged 60-89; 18% women) in their homes, with testing sessions under video and audio supervision and assistance. The battery was administered three times within one week to assess test-retest reliability. Reaction times, word onset latency, response accuracy, error types, and speech samples were collected and analyzed. Participant experience was generally favorable, and 98% of participants completed all three testing sessions. Recorded speech levels were also sufficient relative to home noise levels to support CASR transcript generation for scoring verbal tasks. Finally, in a subset of 44 participants, similar test battery characteristics were found when the CCAB was repeated later under laboratory conditions. The CCAB shows promise as an objective, reliable automated digital assessment tool to evaluate cognitive functioning in adults.