Using Ecological Momentary Assessment to Index Real-world Treatment Gains From Remotely Delivered Cognitive and Functional Skills Training

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Background

- Computerized cognitive training and skills training have been found to lead to improvements in cognition and skills performance
- Improvements are seen in healthy older people as well as in Mild Cognitive Impairment (MCI)
- The latest generation of these training efforts are delivered fully remotely

The Challenge

- One of the arguments by skeptics is that cognitive training has no real-world benefit
- It is the case that new functional skills are not acquired with cognitive training alone
- However, we train both cognition and functional skills and in this study we used digital assessment (Ecological Momentary Assessment: EMA) data to evaluate real-world transfer of training.

EMA As a Measurement Strategy

- As part of our training effort, participants were paged 3 times per week and asked to answer as to whether they had performed any of the trained tasks since the last survey
- To measure more general transfer, they were also asked if they had performed any technology-related untrained skills as well

EMA Outcomes

Trained Tasks

ATM, Internet Banking, Tech-Based Prescription Refill, Medication Management

Untrained Tasks

General internet use, Mobile Phone calls, sending text messages

Remote Training Strategy

All training in this study was done fully remotely with cloud-connected devices

Current Study

- Healthy Controls over age 60: n=50
- MCI participants over age 60=50
- Skills training FUNSAT: 6 functional tasks, 2 hours per week, up to 12 weeks or graduation
  - Combined training: 3 weeks Brain HQ training, followed by 9 weeks of skills training

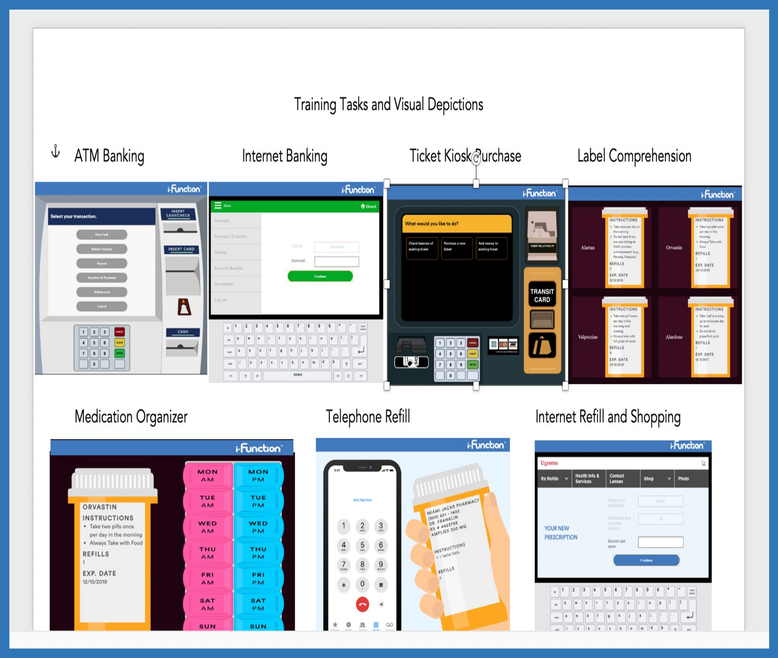
Design

- All HC, skills only, MCI 50% to each intervention
- Training is 100% remote and home based
- Graduation is defined by performance of a training task with either zero or only 1 error
- Outcomes are time to completion and errors
- Assessment Sequence:
- Form 1 at Baseline
- Form 2 after training completion
- Form 3 30 days after training

FUNSAT Tasks

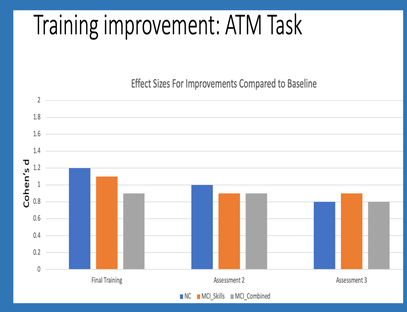
Ticket Purchase, ATM and Internet Banking, Medication Label Comprehension and management, Telephone Voice Menu, Drug Store Website

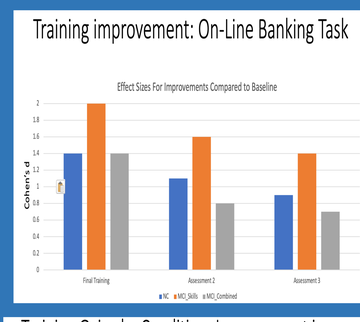
3 different fixed difficulty forms and training version

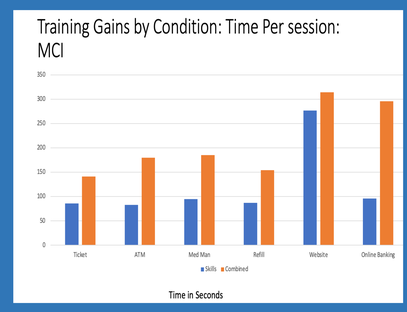


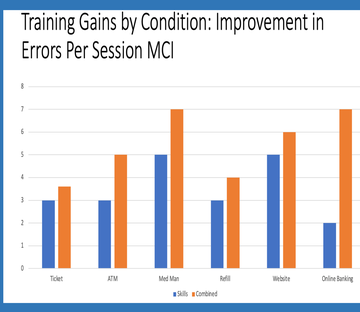
Results

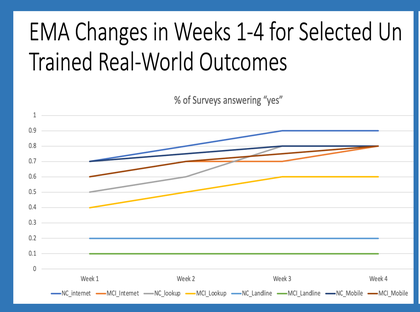
- Both groups improved on all 6 tasks and the MCI participants improved more with cognitive training
- Training gains were preserved across all tasks at the 30-day post training follow-up
- Significant increases in trained and untrained tasks across the entire follow-up period were detected with EMA

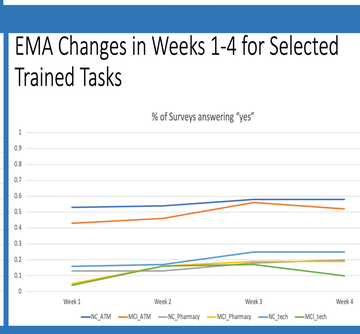


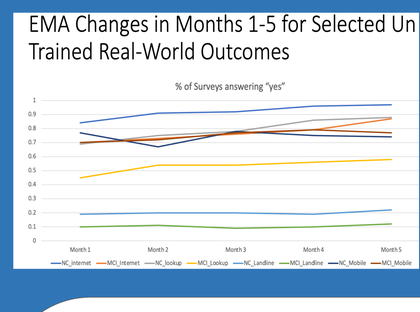


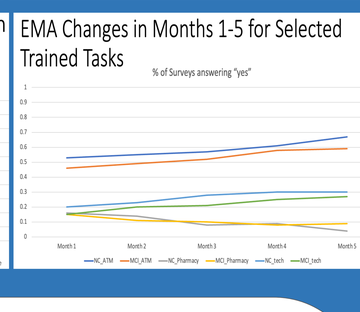












Implications

- Substantial training gains with remote training across conditions and populations
- Gains are maintained post treatment
- EMA detects changes in trained and untrained tasks
- In person pharmacy visits decline and technology facilitated refills are increased
- Increases in general technology usage are detected across populations