Training age-related multitasking deficits in older adults through an action driving video game.

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Experimental Overview

- Older adults have been shown to be more impacted by interference than young adults, especially when that interference is an interruption (part of a secondary task - multitasking; Clapp & Gazzaley, 2010; Clapp et al., 2011).

- We designed a novel action driving videogame (NeuroRacer) to challenge multitasking abilities through the integration of i) a target discrimination task, and ii) a visuospatial tracking task. This paradigm served as the basis for 2 different training interventions (dual-task training & single-task training) targeting age-related multitasking deficits in interference processing.

- Following an initial enrollment of 60 healthy older adults (61-79), 50 individuals completed either a dual-task training regime, a single task training regime, or acted as a no contact control group. Training took place at home in twelve 1-hour sessions over the course of a month. Participants were evaluated on a battery of cognitive measures as well as the NeuroRacer game before and after the training period.

NeuroRacer Conditions/Training

- **Discrimination**
  - No Interference
  - Single-task Training (n= 15)
  - Dual-task Training (n= 20)
  - No Contact Control (n= 15)

- **Tracking**
  - No Interference

- **Multitasking**
  - Interruption

**Sign Level - Training**

**Training Results**

Dual and Single task training for discrimination and tracking across the 12 sessions. Discrimination training showed a group main effect (p< .005), unlike tracking (p> .25). However, there was no group x session (2x) interaction for either measure (p> .30 for each).

**NeuroRacer Results**

Dual-task training led to smaller discrimination multitasking costs than single-task training or practice-related effects (p< .005). No such effects were observed for tracking (p> .25). Examination of each condition separately reveal that this improvement was not practice or single-task dependent, supporting the selectivity of the multitasking training.

**Future Directions**

This intervention showed the effective ability to mitigate age-related discrimination multitasking effects. Subsequent analyses will focus on the examination of EEG recordings during the NeuroRacer task, other measures of the cognitive battery, and performance on selected measures 6 months following each participant’s final visit.

Questions? Comments? email: joaquin.anguera@ucsf.edu

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