Distributed Attention Training in Young Adults
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Introduction
Attention is fundamental to our ability to navigate the complex sensory input we face daily and effectively engage in goal-directed activities. But outside of its relevance for normal functioning, attentional control deficiencies are an elementary part of many neurological disorders. This prevalence lead to our creation of a cognitive paradigm aimed at training attention.

We have developed a spatial distributed attention task ("DAT") on multiple platforms to assess focused and distributed attention. This task is designed to manipulate the amount of cued information regarding where a target will appear. In the present study we used an iPad-adapted version of DAT to examine whether the ability to focus and distribute attention can be trained and improved.

Methods
Task Paradigm
> Central spatial cue with varying degrees of information indicating where a go/no-go target is going to appear
> Participants were instructed to hold down "Home" button throughout the duration of trial until target appearance; respond by releasing "Home" button and tapping target
> Participant must tap "go" target within allotted time window ("Goal Reaction Time")
> Level progression dependent on the performance
> Amount of cued information incrementally decreases as the levels progress
> Upon progression through all levels of information, participant begins again at first level with a reduced "Goal Reaction Time"

Data Collection
> 30 healthy young adults (mean age 24.14 +/- 2.82 years; 17 females)
> 2 Study groups: Control group trained on a non-cognitive application PocketBowl, Train group trained on DAT
> All participants had 2 visits, prior to (Pre) and following (Post) training
> In lab: Neural (EEG) and behavioral outcome assessments.
> At-home: 30 minutes a day, 5 days a week for 2 weeks for a total of 10 hours of training.

Results

Figure A. DAT Test Pre to Post Performance

Figure B. DAT Test Pre to Post Performance

Figure C. Baseline Reaction Time

Conclusions
> Compared to young adults who trained for 10 hours on a non-cognitive paradigm, those who trained for 10 hours on DAT significantly improved distributed attention in the spatial domain.

> In the Train Group, performance on 0% cued-information trials following training was significantly greater than performance on 100% cued-information trials prior to training. This was not observed in Controls.

> Those who trained on the distributed attention paradigm improved in selective attention measured by the Useful Field of View task, whereas the Controls did not.

> Training on DAT similarly improved performance on top-down processing speed measured by the Visual Search task, whereas the Controls did not.

> Baseline psychomotor speed did not improve after training for either study group, excluding the possibility that these results were the product a general "quickening" of the Train group.

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