Neuroplastic Brain Fitness Exercises Improve College Students’ Attention Span

Center for Molecular & Behavioral Neuroscience, Rutgers University, Newark, NJ, USA

Abstract

This study investigated the effect of Fast ForWord® “brain fitness” exercises on college students’ cognitive skills, specifically selective and sustained attention. Fast ForWord® is a series of software programs (disguised as computer games) that focus on building language and foundational cognitive skills (memory, attention, processing rate, and sequencing). Fast ForWord, based on neuroplasticity research, uses frequent and intense practice, individually adaptive trials, sustained attention, simultaneous training, and timely rewards to drive neural change (Tallal, 2004). A pretest-posttest, randomized comparison group, crossover experimental design was used. 78 college students took a battery of cognitive assessments at the beginning and end of a 6-week training session. The participants were randomly assigned to Training Group 1 or Training Group 2. During the first training session, Training Group 1 (N=41) was trained using Fast ForWord Literacy (FFL) and Fast ForWord Reading Level 3, 4, and 5 computer software and Training Group 2 (N=37) served as a no training control. Results from this study showed that Training Group 1 made statistically greater improvement (pre- vs. posttest scores) in attention than the control group.

Methods

Participants

82 college students enrolled in Rutgers University-Newark during the 2010-2011 academic year were initially recruited from two populations to participate in this study:

(1) Students enrolled in developmental writing courses before being able to take the required composition courses (N=42), and

(2) L-SAMP scholars enrolled in STEM majors (N=40).

Stevens et al. (2008) using Fast ForWord training to improve language-impaired and typically developing children. Most students satisfactorily completed Fast ForWord Literacy and were working on Fast ForWord Reading Level 3 at the end of the study, but 16 students had moved on to Fast ForWord Reading Level 4 and 4 students had progressed to Fast ForWord Reading Level 5.

Testing Measure

Mindstreams® Cognitive Assessment Battery

Mindstreams® is a computerized assessment battery testing memory, executive function, attention, information processing, visual spatial, and verbal function. Specifically, participants’ attention was assessed using the following subtests:

- Go-NoGo
- Stroop Interference
- Staged Information Processing

The Go-NoGo test is a test of response time and inhibition. Participants are presented with a series of large colored squares at variable delays (2 or 3 s). Participants are instructed to respond as quickly as possible by pressing a mouse if the square is any color but red.

STROOP INTERFERENCE

Participants are presented with a word that names a color in letters of a color other than that named by the word. Participants must choose as quickly as possible which of two squares is the same color as the letters of the word presented immediately prior.

STAGED INFORMATION PROCESSING SPEED

Participants are presented with a series of digits and arithmetic problems and are instructed to respond as quickly as possible by pressing the left mouse button if the digit is ≤ or = to 4 and the right mouse button if it is > 4. Stimuli are presented at three different rates (600-2000 ms), incrementally increasing as the testing continues.

Results

Fast ForWord® Product Use

Students used the Fast ForWord products 12-32 days (mean = 28.2 +/- 4.8) and had attendance ranging from 52% to 96% (100% corresponds to 5 days/week) with a mean of 76%.

The group of students who used the Fast ForWord products made significantly greater improvement on measures of Attention than the comparison group. A repeated measures analysis of variance (ANOVA) showed that the difference was statistically significant (F(1,76) = 7.3; p < 0.01).

References


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