Introduction

As older adults comprise an increasingly large portion of our population (Hertzog, Kramer, Wilson, & Lindenberger, 2008), the importance of finding ways to ameliorate age-related cognitive decline is important for society as a whole as well as for individuals as they grow older. Older adults who exercise their brain using computer programs (the Brain Fitness Program) trains users through auditory-verbal games. Smith et al. (2009) reported significant training effects on verbal neuropsychological tests, but no published work has been done with the second computer program, InSight. InSight includes five computer games designed to improve visual processing, visual precision, divided attention, useful field of view, and visual memory (see Figure 1).

Hypothesis

Older adults who exercise their brain using InSight (experimental group) will show improvements in tests of visual memory and processing speed compared to older adults who do not (control group). Neither the experimental nor the control group will show improvements in tests of verbal memory.

Table 1. Mean Baseline and Change Scores in Main Dependent Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Experimental</th>
<th>Control</th>
<th>Group Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>Change</td>
<td>Baseline</td>
</tr>
<tr>
<td>Verbal Tasks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RBANS Verbal</td>
<td>76.7 (12.7)</td>
<td>1.4 (8.5)</td>
<td>75.0 (17.8)</td>
</tr>
<tr>
<td>HVLT-R</td>
<td>22.9 (4.7)</td>
<td>0.2 (3.8)</td>
<td>21.7 (7.0)</td>
</tr>
<tr>
<td>Visuospatial Tasks</td>
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<td></td>
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<tr>
<td>RBANS Visuospatial</td>
<td>81.1 (14.1)</td>
<td>5.8 (2.0)*</td>
<td>88.6 (13.8)</td>
</tr>
<tr>
<td>Clock Drawing</td>
<td>9.2 (1.7)</td>
<td>0.6 (1.0)*</td>
<td>10.1 (1.4)</td>
</tr>
<tr>
<td>Processing Speed Tasks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trails B-A</td>
<td>79.2 (40.5)</td>
<td>12.3 (40.9)</td>
<td>65.4 (55.3)</td>
</tr>
<tr>
<td>WAIS-III Digit Symbol</td>
<td>50.9 (13.3)</td>
<td>3.2 (6.0)*</td>
<td>54.1 (13.6)</td>
</tr>
<tr>
<td>Working Memory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WAIS-III Letter Number</td>
<td>8.1 (1.9)</td>
<td>1.2 (1.5)*</td>
<td>9.1 (2.7)</td>
</tr>
</tbody>
</table>

Note. * designates a significant (p < .05) change score.

Methods

Participants

- Participants were recruited through Dr. Ong’s medical office and a local community center.
- There were 21 in the experimental group and 20 in the waitlist control group.
- The mean age in both the present study and the Smith et al. (2009) study was 78.9. The mean education in both the present study and the Smith et al. (2009) study was 13.6 years. The mean income in the experimental group was 83,000 and in the control group 86,000.

Procedure

- Neuropsychological testing 1 (baseline)
- 40 sessions of InSight for the experimental group, 8-10 weeks of normal life for the waitlist control group
- Neuropsychological testing 2
- 40 sessions of InSight for the waitlist control group, 8-10 weeks of normal life for the experimental group

Results

- Table 1 reports scores on our neuropsychological measures.
- Paired-samples t-tests showed significant improvement in the experimental group on visuospatial measures (RBANS Visuospatial, Clock Drawing), a measure of processing speed (WAIS-III Digit Symbol), and a measure of working memory (WAIS-III Letter Number Sequencing).
- No significant changes were seen for the control group on any measure.
- The comparison of the experimental and control groups’ change scores yielded significantly greater improvements for the experimental group on the visuospatial measures (RBANS Visuospatial, Clock Drawing).

Discussion

- Older adults who completed visuospatial computer-game training showed significant improvement on standardized visuospatial tests; the controls did not.
- Smith et al. (2009) found that older adults who completed auditory-verbal computer-game training improved on standardized auditory-verbal memory tests significantly more than controls did.
- The training groups in both the present study and the Smith et al. study improved on measures of processing speed and working memory, while the control groups did not.
- Taken together, these results are evidence of training specificity across verbal/visuospatial domains as well as a general effect of computer game training on speed of processing and working memory.
- Support was found for cognitive exercise ameliorating age-related cognitive declines.

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References


Figure 1. Screen shots from the five InSight games