Neuropsychological Assessment Outcomes following Cognitive Rehabilitation Training for Children and Adults with Traumatic Brain Injury

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INTRODUCTION

Background. Cognitive struggles often persist beyond the TBI recovery period. Deficits typically involve memory, processing speed, and reasoning skills. LearningRx is a clinician-delivered cognitive rehabilitation training program that targets multiple cognitive skills through repeated engagement in game-like but rigorous mental tasks in 90 minute training sessions at least 3 days per week. The current study examined neuropsychological and functional outcomes following 95 hours of LearningRx training with 329 clients post-TBI.

Research Problem. We have reported improvements in cognition and/or neural connectivity in multiple studies on LearningRx cognitive training programs1,2,3,4,5 but no studies using LearningRx between children and adults.

METHODS

• Using a quasi-experimental design, we examined changes in IQ score, individual cognitive skills, and everyday functioning following 95 hours of training for 329 clients with Traumatic Brain Injury.
• The intervention included more than 100 exercises that target working memory, long-term memory, processing speed, attention, visual processing, auditory processing, and reasoning skills delivered one-on-one by a clinician.
• Training intensity was tightly controlled by the clinician using a metronome, timer, and deliberate distractions to “load” the participant with several simultaneous tasks. A metronome added to the distraction to ensure that mental breaks were minimized.
• Clients attended three 90-minute training sessions per week for an average of 95 hours over 6-9 months.
• Assessments included the Woodcock Johnson Tests of Cognitive Abilities and the LearningRx Client Survey.

SAMPLE

• Nationwide sample from 42 LearningRx clinics in 27 states
• n = 329 clients at least 3 months post-TBI (mild to moderate)
• Ages 6-87, Mean = 26.4
• 18-29 28.6
• 30-55 77.3
• 56+ 22.8
• 39% Female / 61% Male

NEUropsychological TESTING RESULTS

ADULTS (Ages 18+)

<table>
<thead>
<tr>
<th>IQ Score</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>106</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>108</td>
<td>Pre</td>
<td>Post</td>
</tr>
</tbody>
</table>

CHILDREN (Ages 6-17)

<table>
<thead>
<tr>
<th>IQ Score</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>104</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>106</td>
<td>Pre</td>
<td>Post</td>
</tr>
</tbody>
</table>

Difference in Standard Score Change* Adults versus Children

<table>
<thead>
<tr>
<th>Change</th>
<th>Adults</th>
<th>Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.11</td>
<td>LTM</td>
<td>WM</td>
</tr>
<tr>
<td>10.10</td>
<td>PS</td>
<td>LR</td>
</tr>
<tr>
<td>10.10</td>
<td>AP</td>
<td>Attn</td>
</tr>
</tbody>
</table>

*MANOVA revealed no statistically significant differences between children and adults on any of the outcome variables (all p values > .05).

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REFERENCES


TRANSFER TO REAL LIFE CHANGES

ADULTS

• Improved work performance: Writing, organizational skills, productivity
• Greater self-discipline, diligence, & coping skills when challenged
• Increased confidence, positive outlook, hope, & optimism
• Better driving ability
• Improved focus, attention, memory, & processing speed
• Improved social skills

CHILDREN

• Improved academic performance: Reading, comprehension, writing, math, social studies, & homework skills
• Greater self-discipline, organization, initiative, & decision-making skills
• Increased confidence, optimism, self-esteem, & positive outlook
• Improved focus, attention, memory, & processing speed