Independent and Additive Effects of Cognitive Remediation and Functional Skills Training in Schizophrenia: Generalization to Behavior Change?

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Disclosures

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• Scientific Advisory Board: Abbott Pharmaceuticals
• Research Funding: NARSAD
• Research Support: Scientific Brain Training
The Problem

Functional impairment is vast, common and severe in schizophrenia.

The Argument

Cognition is the optimal treatment target because it has the strongest relationship with functioning.

The Logic

If \( C = F \)

Then \( C (+N) = F (+N) \)
Wrench I

Third Variable(s)

• Schizophrenia likely involves neurodevelopmental hit(s) that, for many people:
  – Limit academic achievement
  – Reduce social opportunities
  – Preclude vocational training and experiences
  – Disrupt the acquisition of independent living skills

• Should we expect rehabilitation to occur for people who missed many habilitative opportunities?
Wrench II

Competence ≠ Performance

• The competence to perform activities does not fully translate to real world behavior

• This is a critical measurement distinction when attempting to identify targets for disability reduction
Prediction of Real World Behaviour in Schizophrenia
N=161

Bowie et al, in press, Am J Psychiatry
Cognitive Remediation Appears to Generalize to Behavior Change...in Context

• Kurtz (2009) – Cognitive Remediation improves UPSA
• Silverstein (2009) – Attention shaping potentiates skills training
• McGurk (2007) Significant heterogeneity between studies

Adapted from McGurk et al, Am J Psychiatry, 2007
Study Design

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Week 1-12</th>
<th>Week 13-24</th>
<th>Week 36</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRT</td>
<td>Baseline Assessment</td>
<td>Cognitive Remediation</td>
<td>Post-Treatment Assessment</td>
</tr>
<tr>
<td>FAST</td>
<td>Baseline Assessment</td>
<td>Functional Skills Training</td>
<td>Post-Treatment Assessment</td>
</tr>
<tr>
<td>COM-BINED</td>
<td>Baseline Assessment</td>
<td>Cognitive Remediation</td>
<td>Intermediate Assessment</td>
</tr>
</tbody>
</table>
Measures

• Cognition
  – Brief Assessment of Cognition in Schizophrenia
• Symptoms
  – Positive and Negative Syndrome Scale
• Adaptive Competence
  – Composite of UPSA, Advanced Finances, Medication Management
• Social Competence
  – Social Skills Performance Assessment
• Real World Functional Behavior
  – Specific Levels of Function Scale
CONSORT Chart

Referred
N= 119

Consented
N= 114

Allocated to CRT
N=38
2 lost before treatment
7 lost during treatment

CRT Analyzed
N=29

Allocated to FAST
N=38
3 lost before treatment
7 lost during treatment

FAST Analyzed
N=28

Allocated to Combined Treatment
N=38
2 lost before treatment
9 lost during treatment
1 lost post-treatment

Combined Analyzed N=26
<table>
<thead>
<tr>
<th><strong>CRT</strong></th>
<th><strong>FAST</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Target: 120 minutes, 1-2x per week for 12 weeks</td>
<td></td>
</tr>
<tr>
<td>• Small groups</td>
<td></td>
</tr>
<tr>
<td>– Non-social in nature</td>
<td></td>
</tr>
<tr>
<td>– 1:2 Therapist: Patient</td>
<td></td>
</tr>
<tr>
<td>• Sessions</td>
<td></td>
</tr>
<tr>
<td>– 60% Drill and Practice</td>
<td></td>
</tr>
<tr>
<td>• Individualized target domains based on baseline deficits</td>
<td></td>
</tr>
<tr>
<td>• Sequentially-based (speed, attn, wm, memory, ex fx)</td>
<td></td>
</tr>
<tr>
<td>• Cogpak, PSS CogRehab, Scientific Brain Training Pro</td>
<td></td>
</tr>
<tr>
<td>– 20% Strategy Coaching</td>
<td></td>
</tr>
<tr>
<td>– 20% Discussion of Bridging and Compensatory</td>
<td></td>
</tr>
<tr>
<td>• Target: 120 minutes, 1-2x per week for 12 weeks</td>
<td></td>
</tr>
<tr>
<td>• Small groups</td>
<td></td>
</tr>
<tr>
<td>– Social in nature</td>
<td></td>
</tr>
<tr>
<td>– 1:3 Therapist: Patient</td>
<td></td>
</tr>
<tr>
<td>• Sessions</td>
<td></td>
</tr>
<tr>
<td>– Hierarchical Skill Acquisition</td>
<td></td>
</tr>
<tr>
<td>1. Non-verbal skills</td>
<td></td>
</tr>
<tr>
<td>2. Interpersonal Skills</td>
<td></td>
</tr>
<tr>
<td>3. Assertiveness</td>
<td></td>
</tr>
<tr>
<td>4. Instrumental Communication</td>
<td></td>
</tr>
<tr>
<td>5. Financial Management</td>
<td></td>
</tr>
<tr>
<td>6. Medication Management</td>
<td></td>
</tr>
</tbody>
</table>
## Characteristics at Baseline

<table>
<thead>
<tr>
<th></th>
<th>CRT (N=29)</th>
<th>FAST (N=28)</th>
<th>COMBINED (N=26)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Premorbid Cognition</strong></td>
<td>44.9 (5.0)</td>
<td>45.3 (4.8)</td>
<td>44.1 (4.1)</td>
<td>.71</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td>13.7 (1.9)</td>
<td>13.7 (2.0)</td>
<td>13.1 (1.3)</td>
<td>.21</td>
</tr>
<tr>
<td><strong>Age at Baseline</strong></td>
<td>39.5 (12)</td>
<td>41.5 (9.5)</td>
<td>36.7 (8.9)</td>
<td>.21</td>
</tr>
<tr>
<td><strong>PANSS Neg Sx (M item score)</strong></td>
<td>2.7 (.99)</td>
<td>2.5 (.67)</td>
<td>3.0 (.76)</td>
<td>.11</td>
</tr>
<tr>
<td><strong>PANSS Pos Sx (M item score)</strong></td>
<td>2.5 (.96)</td>
<td>2.7 (.93)</td>
<td>3.1 (.69)</td>
<td>.11</td>
</tr>
</tbody>
</table>
Cognition

Z-Score
Higher is Better

Baseline | Post-Tx | 12 Week Durability

- CRT
- COMBINED
- FAST
Social Competence

Percent of Total Score
Higher is Better

Baseline | Post-Tx | 12 Week Durability

CRT
COMBINED
FAST
Real World Functional Behavior

Mean Raw Score (0-5)
Higher is Better

Baseline Post-Tx 12 Week Durability
Implications

• Effects of CRT and Functional Skills Training were largely domain-specific

• CRT, when paired with Functional Skills Training, appears to facilitate larger and more durable adaptive skills acquisition

• Changes in real world behavior were small and of questionable clinical meaningfulness as measured with the SLOF 12 weeks post-intervention
Conclusions

• CRT without supplemental skill acquisition might not be sufficient.

• CRT might be necessary for optimal skill acquisition and durability in rehabilitation settings

• Change in real world behavior will likely require additional environmental supports following cognitive enhancement and skill acquisition
“New York State discriminated against thousands of mentally ill people in New York City by leaving them in privately run adult homes, which effectively replaced state-run psychiatric hospitals more than a generation ago but turned out to be little more than institutions themselves.”

4,300 mentally ill people in New York City in more than two dozen adult homes. He said the residents had little hope of mingling with anyone in the wider community.

“State Discriminated Against Mentally Ill, Judge Rules.” NY Times, Sept 8, 2009
Study Limitations

• Short Intervention

• Short durability

• Specific to instruments?

• Opportunity to use skills in everyday life?
Cognitive Remediation Potentiates the Effects of Vocational Therapy

Adapted from Bell et al, 2008
What are Reasonable Treatment Goals?

- Once cognitively enhanced, focus on skill acquisition
- Foster Deployment of skills in the real world
- Address Negative Symptoms and Depression, which may suppress deployment of skills
- Cognitive distortions and expectancies
- Societal and environmental barriers
Thank You

• Funding: NARSAD

• Software Support: Scientific Brain Training

• CRT: Michael Parrella & Susan McGurk
• FAST: Thomas Patterson & Brent Mausbach
• BACS: Richard Keefe
• RAs, Psychologists, and Doctoral Students
  – Stephanie Taillefer, Shannon Xavier, Emma Bassett, Winnie Leung, Amelia Bowman, Jeremy Stewart, Talia Troister, Allisha Patterson, Sylvia Magrys

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