“Cognitive Enhancement Therapy and Enriched Supportive Therapy For Adults ≥ 17 years with ASD”

Arizona “Back to School & More” Autism/Asperger Conference
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Interventions Developed By

- Prof. Gerard Hogarty and colleagues for schizophrenia who is now deceased
- Carried on in schizophrenia and extended to ASD by Dr. Shaun Eack and Dr. Nancy Minshew
Advances in Psychosocial Treatment for Adults with Autism Spectrum Disorder

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Disclosures

• Grant support from:
  – Pennsylvania Department of Health
  – Autism Speaks
  – National Institute of Mental Health
  – Department of Defense

Attests to: the capacity of states to initiate innovative advances, the importance of private foundations in early stage funding, and of DoD funding for non-mechanistic clinical trials.
Magnitude of the Need

Prevalence of ASD: 1.5%-3%
Proportion With IQ > 85: 50%
Proportion With IQ 71-85: 23%
Autism Spectrum Disorder – ASD

- Autism spectrum disorder is characterized by the following plus others:
  - Impairments in social interaction
  - Impairments in verbal and non-verbal communication
  - Restricted and repetitive interests
- Disabling across a large number of life domains (social, vocational, educational)
- Disability increases after they leave the structure and supports of school

CDC, 2014
State of Treatment for ASD

• 9 mos-5 years: “Early” detection
• 1-5 years: Early intervention
• 5-18 years: Behavioral, cognitive, and educational interventions
• 5-18: Pharmacologic treatment
• 18-21: School transition/work preparation
• 21-: ?
Comprehensive Interventions for Adolescents with ASD  Odom et al, 2010

• Need to target multiple domains, highlight adaptive function in real life situations as opposed to highly structured settings
• School-based
• List is very short and still emerging:
  – PEERS- probably best known
  – Unstuck/On Target (UOT)
  – summerMAX - ICONz®
State of Adult ASD Treatment

### Table 1 Characteristics of psychosocial intervention studies for adults with autism spectrum disorders

<table>
<thead>
<tr>
<th>Study</th>
<th>n</th>
<th>Mean age</th>
<th>% male</th>
<th>Mean IQ</th>
<th>Method</th>
<th>Type of intervention</th>
<th>Outcome category</th>
<th>Cohen’s d</th>
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<tbody>
<tr>
<td>Baker et al. (2005)</td>
<td>1</td>
<td>–</td>
<td>100</td>
<td>–</td>
<td>Case study</td>
<td>ABA</td>
<td>Repetitive behavior</td>
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<tr>
<td>García-Villamisar and Dattilo (2010)</td>
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<td>30.81</td>
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<td>RCT</td>
<td>Other</td>
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<tr>
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<td>ABA</td>
<td>Communication</td>
<td>–</td>
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<tr>
<td>Moore (2009)</td>
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<td>18</td>
<td>100</td>
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<td>Case study</td>
<td>ABA</td>
<td>Repetitive behavior</td>
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<tr>
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<td>Repetitive behavior</td>
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<td>Trepagnier et al. (2011)</td>
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<td>Turner-Brown et al. (2008)</td>
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<td>Deficits of social interaction</td>
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</table>

State of Adult ASD Treatment

• We know almost nothing about what is most effective for helping adults with autism spectrum disorder
• Almost no treatment programs are available to help adults
• Has resulted in a policy of generally ignoring the well-being and care of adults with an autism spectrum disorder
The Problem

- 99.9% of children with autism grow up!
- Transition to adulthood is difficult, especially if you have autism
- Core impairments in social and non-social cognition limit adaptive behavior in adulthood

Why CET for Adults with ASD?

Cognitive Remediation

- Brain plasticity – “The brain’s lifelong capacity for physical and functional change”
- The brain is plastic, flexible, and malleable.
- Experience can shape brain function.
- Learning is an example of the brain’s ability to change and adapt.
- The “right” experiences can improve brain function.

Why CET and EST for Adults with ASD?
Lessons From Schizophrenia

Hogarty et al., 2004. *Arch Gen Psychiatry*. 61:866-876.
Why CET for Adults with ASD? Lessons From Schizophrenia

Eack et al., 2010. *Arch Gen Psychiatry* 67:674-682.
Perspectives Program

• Research program designed to build an evidence base for effective treatments for adults with autism
• Housed at the University of Pittsburgh Center for Excellence in Autism Research
• Provides free diagnosis and testing
• Currently testing two 18-month treatments:
  – Enriched Supportive Therapy (EST)
  – Cognitive Enhancement Therapy (CET)

Funded by NIH, Autism Speaks, DoD, and Pennsylvania Department of Health
Adaptations of CET and EST for ASD

• Remove all schizophrenia content and replace it with latest material on ASD
• Increase clinical outreach
• Turn off sound to some computer exercises
• Provide greater guidance and repetition of advanced social-cognitive training
Feasibility and Acceptability of CET (N = 14)

<table>
<thead>
<tr>
<th>Measure</th>
<th>N</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td><strong>Adherence</strong></td>
<td></td>
<td></td>
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<tr>
<td>Number completing first 9 months of CET</td>
<td>14</td>
<td>100</td>
</tr>
<tr>
<td>Number completing entire 18 months of CET</td>
<td>11</td>
<td>79</td>
</tr>
<tr>
<td>Average percent of neurocognitive training sessions attended (M/SD)</td>
<td>89</td>
<td>15</td>
</tr>
<tr>
<td>Average percent of social-cognitive group sessions attended (M/SD)</td>
<td>85</td>
<td>14</td>
</tr>
<tr>
<td><strong>Acceptability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average overall satisfaction with CET (M/SD)</td>
<td>3.57</td>
<td>.51</td>
</tr>
<tr>
<td>Average CSQ-8 total satisfaction score (M/SD)</td>
<td>3.27</td>
<td>.46</td>
</tr>
<tr>
<td>Number “mostly satisfied” with CET</td>
<td>14</td>
<td>100</td>
</tr>
</tbody>
</table>

Preliminary Findings on Benefits of CET in ASD (N = 14)

Eack et al., 2013. JADD. 43:2866-2877.
Randomized Controlled Trial of CET and EST in ASD: In Progress

• Inclusion criteria:
  – Autism or autism spectrum disorder based on the ADOS
  – Age 16-45
  – IQ ≥ 80
  – Not abusing substance within past 3 months
  – No significant disruptive behavior
  – Significant cognitive and social disability
• Randomized to CET or EST and treated for 18 months
• Assessed at baseline, 9, and 18-months
Cognitive Enhancement Therapy

• A recovery-phase intervention for remediating neurocognitive and social-cognitive deficits in schizophrenia developed by Hogarty and colleagues (2004, 2006).

• Neurocognitive Training
  – Computer-based training in attention, memory, and problem-solving.
  – 1 hour/week
  – 60 hours total

• Social-Cognitive Group Therapy
  – Training in perspective-taking, gistfulness, non-verbal communication, emotion perception, and much, much more.
  – 1.5 hours/week
  – 45 sessions

Developmental Framework

- Schizophrenia are neurodevelopmental disorders
- Social and non-social cognitive deficits in both are the result of a neurodevelopmental disruption
- The brain has the potential to respond to enriched social and non-social cognitive experiences
- These targeted experiences can “jump-start” social and non-social cognitive development in schizophrenia and ASD
## Targets of CET

<table>
<thead>
<tr>
<th>COGNITIVE STYLE:</th>
<th>CET WILL HELP YOU TO:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmotivated Thinking</td>
<td>Generate ideas, get motivated, enhance language, actively think</td>
</tr>
<tr>
<td>Disorganized Thinking</td>
<td>Organize ideas; get the main point(s) or “gists”; control strong emotions (flooding)</td>
</tr>
<tr>
<td>Inflexible Thinking</td>
<td>Choose alternative solutions or explanations; become cognitively flexible; tolerate uncertainty</td>
</tr>
</tbody>
</table>
Goals of CET

I. Foster Higher Thinking By Becoming:

   Gistful vs. Concrete

   An Active Thinker vs. Passive Receiver of Information

   Cognitively Flexible vs. Following Rigid Rules

   More Spontaneous vs. Rehearsed

   More of an Initiator vs. Doing Nothing
Goals of CET

II. Help to develop:
• Social Wisdom (norms and rules of behavior)
• Context Appraisal (what is going on)
• Perspective Taking (how others feel, think and respond)
• Foresightfulness (If I do this ..., then ...)
• Empathy and Support (being reciprocal)
• Social Comfort
Neurocognitive Training

• Attention\(^1\)
  – Improve processing speed, maintain cognitive set, increase sustained attention.

• Memory\(^2\)
  – Encourage compensatory strategies, encode information in meaningful ways.

• Problem-Solving\(^2\)
  – Encourage planning, cognitive flexibility, logic.

\(^1\)Developed by Yehuda Ben-Yishay, Ph.D. (Yehuda.Ben-Yishay@msnyuhealth.org)
\(^2\)Developed by Odie Bracy, Ph.D. (www.neuroscience.cnter.com)
Neurocognitive Training

- Performed in pairs
- Develops the skills, such as improved attention and the processing of verbal instructions that helps people benefit from the social-cognitive group experience.
- Integrates CET concepts such as working memory, gist, foresightfulness and cognitive flexibility with computer exercises
- Encourages interaction, socialization and positive feedback between participants
Attention Reaction Conditioner (Ben-Yishay Exercise): Processing Speed

ENTER TO GO ON  ESC TO CHANGE
Attention Reaction Conditioner (Ben-Yishay Exercise)

- Goal is to press the spacebar in response to a target light as fast as possible
- The faster the response the more circles or feedback lights are illuminated
- Cues (beeps) are given 5 seconds before the target light
- Cues are gradually reduced from 5 to 3
- Feedback interval is reduced from 300ms to 170ms
Objects and Locations
(Bracy Memory Exercise)
Objects and Locations
(Bracy Memory Exercise)

• Goal is to remember as many objects and their locations as possible
• Begins with remembering 4 out of 30 objects/locations
• Gradually increases to remembering 8 or more objects/locations
Simply Logical (Bracy Problem-Solving Exercise)

1. Click on a round color button
2. Click on a window to make it that color
3. When you have the window colors like you want them, click Enter Response
Simply Logical (Bracy Problem-Solving Exercise)

- Goal is to determine which of 5 colors are assigned to the gray boxes in 10 trials or less.
- Feedback is given after each trial about correct/incorrect color assignment.
- Number of guessed colors is gradually increased from 3 to 5.
Social-Cognitive Group

- Small group structure (6-8 patients)
- Contains coaches rather than therapists
- Structured format:
  - Welcome back
  - Homework chairperson
  - Homework presentation and questioning
  - Exercise
  - Feedback
  - Psychoeducation talk
  - New homework assignment
Importance of Experience-Based Learning - Not Just The Facts - And of “Groupness”
## CET vs. Group Psychotherapy

<table>
<thead>
<tr>
<th>CET Focus</th>
<th>Psychotherapy Focus</th>
</tr>
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<tbody>
<tr>
<td>Educational curriculum</td>
<td>Personal feelings</td>
</tr>
<tr>
<td>Cognition</td>
<td>Symptoms</td>
</tr>
<tr>
<td>Prepare prior to sessions</td>
<td>No preparation</td>
</tr>
<tr>
<td>Specific agenda, led by coach</td>
<td>No order; can say anything</td>
</tr>
<tr>
<td>and chairperson</td>
<td></td>
</tr>
</tbody>
</table>
Social-Cognitive Group

- **Module I – Basic Concepts**
  - Understanding and coping with ASD
  - Getting motivated, using gistful thinking, improving memory, cognitive flexibility
  - Example exercise: Extracting gists from editorials

- **Module II – Social Cognition**
  - Acting wisely in social situations
  - Appraising the social context
  - Taking another person’s perspective
  - Reading non-verbal cues
  - Example exercises: Sending a condensed message, Dragnet and Columbo
Social-Cognitive Group

• Module III – Applying CET
  – Responding to common social dilemmas
  – Building social relationships
  – Initiating meaningful activities (e.g., school, work)
  – Generalization to new situations
  – Obstacles to using CET
  – Example exercise: Using CET to help a friend
CET Coaches

• No single profession – psychologists, nurses, social workers
• Knowledgeable about ASD
• Interested and curious
• Open-minded/Comfortable in changing from a traditional therapeutic stance
• Persevering and Flexible
• Supported by administration
From Therapist to CET Coach

• Builds on existing therapeutic skills
• Focuses on role performance vs. symptoms
• No longer the problem-solving “ego,” now provides:
  – Structure and instruction
  – Hope and reinforcement
  – Common sense
• Encourages autonomous problem-solving and initiation
• Fosters higher-level thinking and abstraction by asking questions that encourage elaboration and abstraction
Principles of Coaching

- Coaching relies on:
  - A coaching plan
  - Knowledge of a patient’s cognitive style

- Coaching focuses on fostering higher-level thinking and abstraction by:
  - Asking questions that encourage elaboration and abstraction
  - Allowing patients to struggle ... within reason (not errorless learning)

- Coaches:
  - Are supportive and facilitative
  - Reinforce effort and appropriate social awareness/behavior
  - Make gradual, reasonable, and negotiable requests
  - Connect with the whole group
Coaching Adapted For Different Cognitive Styles

- **Unmotivated** – Coaches ask for examples, encourage elaboration, probe for opinions
- **Disorganized** – Coaches ask for clarity, encourage gistfulness, reward on task behavior and prompt the use of methods to manage emotions
- **Inflexible** – Coaches facilitate the generation of alternatives, encourage decision-making and reward flexible thinking or behavior.
Enriched Supportive Therapy

• Aim: To help prevent the meltdown
• Teaches individuals:
  – About autism spectrum disorders
  – How to manage emotions and stress
  – How to improve social skills
  – Cope with everyday problems and changes
• Individual therapy approach with a skilled EST therapist
Cognitive Enhancement Therapy

• Aim: To help improve thinking, social wisdom (social cognition) and functioning in life roles

• Two parts:
  – Neurocognitive Training – Pairs, computer-based, training in attention, memory, and problem-solving
  – Social-Cognitive Groups – Small group, training in perspective-taking, gistfulness, non-verbal communication, emotion perception, emotion regulation, and more
CET and Social Wisdom

- Social Wisdom (norms and rules of behavior)
- Context Appraisal (what is going on)
- Perspective-Taking (how others feel, think and respond)
- Foresightfulness (If I do this ..., then ...)
- Empathy and Support (being reciprocal)
- Social Comfort
Preliminary Effects on Cognition

<table>
<thead>
<tr>
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<th>EST (N = 12)</th>
<th>CET (N = 14)</th>
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<tr>
<td>Baseline</td>
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</tr>
<tr>
<td>9 Month</td>
<td>P = .824</td>
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<td>18 Month</td>
<td>P = .043</td>
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<td>Neurocognition</td>
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<td>Baseline</td>
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<tr>
<td>9 Month</td>
<td>P = .121</td>
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<tr>
<td>18 Month</td>
<td>P = .042</td>
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<td>Social Cognition</td>
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Preliminary Effects: Reduction in Anxiety and Depression
Preliminary Effects on Functional Outcome
Preliminary Effects on Brain Function: Neural Basis of Response

- Participants were assessed using an emotion regulation task
- Asked to play a go/no-go game for points that had three blocks
  - Easy, hard, easy
- Hard blocks were designed to induce frustration at the loss of points
- Emotion regulation = hard > easy
Preliminary Effects on Amygdala-Prefrontal Connectivity in CET and EST

Treatment x Time Interaction for CET > EST
Summary

- Treatments are urgently needed for adults with ASD.
- EST has the potential to improve broad adaptive behavior and social functioning with some advantage over psychopathology.
- CET has the potential to improve cognition and underlying neural mechanisms with downstream effects on adaptive function.
- Psychosocial treatments that target stress management and cognitive impairment may help address core challenges in adults with ASD.