Unstuck and On Target
Intensive Training Workshop

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>The participant will be able to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lauren Kenworthy, PhD</td>
<td>Recognize executive functioning weaknesses and distinguish among, and accommodate, different executive profiles</td>
</tr>
<tr>
<td>Laura Anthony, PhD</td>
<td>Learn specific scripts or vocabulary and when to use them to increase executive function skills</td>
</tr>
<tr>
<td>Alyssa Verbalis, PhD</td>
<td>Learn about the evidence for the effectiveness of executive function intervention, particularly Unstuck and On Target</td>
</tr>
</tbody>
</table>
Solving Executive Function Challenges in Children with Autism

Lauren Kenworthy, PhD
Professor, Pediatrics, GW Medical School
Director, Center for Autism Spectrum Disorders
Children’s National Medical Center

lkenwort@childrensnational.org
Disclosures

I receive royalties for the sale of:

– Unstuck manuals
– Behavior Rating Inventory of Executive Function (BRIEF) forms and manuals
Unstuck Team

Ivymount Model Asperger Program/Take 2 Summer Camp

• Katie Alexander
• Lynn Cannon
• Monica Werner

Children’s National Center for Autism Spectrum Disorders

• Laura Anthony
• Lauren Kenworthy
• John Strang
• Cara Pugliese

Copyright 2011, 2014 Brookes
Learning Objectives

PART 1 with Lauren:
- Recognize executive functioning weaknesses and distinguish among, and accommodate, different executive profiles

PART 2 with Laura:
- Learn specific scripts or vocabulary and when to use them to increase executive function skills.

PART 3 with Alyssa
- Learn about the evidence for the effectiveness of executive function intervention.
GOAL: Increase your understanding of executive functions and how to enhance them

PLAN

1. What are Executive Functions (EF)?
   - EFs are fractionated and plastic

2. Why do they matter?
   - EFs are necessary for effective everyday functioning

3. How is EF expressed in autism?
   - Flexibility, Organization, Planning/Working Memory problems

4. How can we treat EF problems in autism?
   - In everyday settings, with phenotype specific accommodations & self regulatory scripts
“The Unity and Diversity of Executive Functions”

Cognitive Regulation
- Initiate
- Working Memory
- Planning
- Organization/Integration
- Task Monitor

Behavior Regulation
- Inhibit
- Self-Monitor

Emotion Regulation
- Flexibility
- Emotional Control

Teuber, 1972; Gioia, et al 2002; 2016; Friedman & Miyake, 2017
Neural Substrate of EF Develops Slowly

Figure 1. Developmental course of frontal functions based on average effect sizes of age-related change in performance on measures of frontal lobe functioning.

Romine & Reynolds, 2005; Best et al, 2011
Neural substrate of EF is plastic

- EF not only changes over time, it relies on functional neural networks that develop in the context of experience (Bernstein & Waber, 2007)

Raver et al, 2013
Autism is characterized by mutable developmental trajectories

Early ABA and Optimal Outcome in Autism
(Orinstein et al, 2014)
**GOAL:** Increase your understanding of executive functions and how to enhance them

**PLAN**

1. What are Executive Functions (EF)?
   - EFs are fractionated and plastic

2. Why do they matter?
   - EFs are necessary for effective everyday functioning
Executive Dysfunction (Teuber, 1964): “The curious dissociation between knowing & doing”

EF problems in ASD relate to:

- **Autism Symptoms** (Kenworthy et al, 2009)
- **Adaptive daily living skills** (Lopata et al, 2012, Gilotty et al, 2002)
- **Family stress** (Lounds, 2007)
- **Adult outcomes** (Hume et al, 2009)
  - Over 25% of young adults *without* ID have no daytime activities of any kind (Taylor & Mailick Seltzer, 2010)
Adaptive Skills by Age Group
(ASD n=421; Mean IQ =103)

Vineland Standard Score

Mean Domain Scores in Each Age Group

Pugliese et al, 2015
Adaptive Skills by Age Group (ASD n=327)

Mean Domain Scores in Each Age Group

- Communication
  - Age, IQ, Initiate and Working Memory

- Daily Living Skills
  - IQ, Age, Initiate and Working Memory

- Socialization
  - Age, Initiate and Flexibility

Pugliese et al, 2015, JADD
EF relates to autism sx & supports social learning

• Joint attention: “early developing self-organizing facility” (Mundy, 2003)

• Prolonged visual fixation in infants later dx’d with ASD, coincides with emergence of ASD behaviors (Zwaigenbaum et al, 2005)

• EF predicts change in ToM (independent of age, language, NVIQ) (Pellicano, 2010)

• Indirect “trickle-down” effect of EF training on TOM performance (Fisher and Happé 2005) and social skills (Kenworthy & Anthony et al, 2014)
<table>
<thead>
<tr>
<th>Looks Like <em>Won’t</em>...</th>
<th>Could be <em>Can’t</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oppositional, Stubborn</td>
<td>Difficulty shifting</td>
</tr>
<tr>
<td></td>
<td>Avoiding overload</td>
</tr>
<tr>
<td>Can do it if he wants to</td>
<td>Difficulty shifting</td>
</tr>
<tr>
<td></td>
<td>Lack of salience</td>
</tr>
<tr>
<td>Self Centered</td>
<td>Impaired social cognition</td>
</tr>
<tr>
<td></td>
<td>Poor self monitoring</td>
</tr>
<tr>
<td>Won’t put good ideas on paper</td>
<td>Poor fine motor</td>
</tr>
<tr>
<td></td>
<td>Disorganization</td>
</tr>
<tr>
<td>Sloppy, erratic</td>
<td>Poor self monitoring</td>
</tr>
<tr>
<td></td>
<td>Overloaded</td>
</tr>
<tr>
<td>Won’t control outbursts</td>
<td>Overloaded</td>
</tr>
<tr>
<td></td>
<td>Disinhibition</td>
</tr>
<tr>
<td>Doesn’t care what others think</td>
<td>Impaired social cognition</td>
</tr>
<tr>
<td></td>
<td>Poor self monitoring</td>
</tr>
</tbody>
</table>

Greene, 1998; Bernstein, 2000
• Julia Bascum video re: need to know what you can’t do, so you can figure out accommodations and support
GOAL: Increase your understanding of executive functions and how to enhance them

PLAN

1. What are Executive Functions (EF)?
   - EFs are fractionated and plastic

2. Why do they matter?
   - EFs are necessary for effective everyday functioning

3. How is EF expressed in autism?
   - Flexibility, Organization, Planning/Working Memory problems
Initiate
Working Memory
Planning
Organization
Task Monitor

Inhibit
Self-Monitor

Flexibility
Emotional Control
“Asperger’s is like a vise on your brain. And each unexpected event is like another turn on the vise...it just keeps building until you feel like you’re going to explode. Sometimes when you explode, it comes out the wrong way.”

- A young student with ASD

What does cognitive inflexibility look like?

Can’t or Won’t?
• Accept feedback, different opinions, ideas
• Transition
• Handle frustration
• Start something they don’t want to do
• Stop meltdowns
• Stop doing something even they have been told to stop
• Avoid shutting down when something is challenging
• Stop correcting people
• Let other kids take the lead when playing
Inflexibility Risks and Accommodations

Difficulty with violations of expectations

- Schedules, Routines, Predict change, Flexible Adult

Rigid interpretations of rules

- Respect need for clear, explicit expectations, Flexible Adult

Overwhelming intense feelings

- Breaks, Downtime, Flexible Adult

Problems Negotiating

- Compromise, Explicit Etiquette Rules, Flexible Adult

Repetitive Behaviors/Intense Interests

- Decide where they can/can’t happen, agree on a sign

Schopler, Mesibov & Hearsey, 1995
Inflexibility Strengths

- Deep datasets
- Expertise in areas of interest
- Persistence
- Reliability
- Loyalty
- Routines that don’t interfere
- Inflexibility is adaptive. It limits unexpected, overloading events.
Julia Bascum Video, Linking Accommodations—great example of how routines help—instead of having to invent for the first time how to get dressed in the morning—the failure of routines— it is inflexible of me to insist on the routine but that inflexibility accommodates my trouble keeping track
Cognitive Regulation

Initiate
Working Memory
Planning
Organization/Integration
Task Monitor

Behavior Regulation

Inhibit
Self-Monitor

Emotion Regulation

Flexibility
Emotional Control
Organization/Integration

- Setting and understanding goals
- Prioritizing
- Identifying main idea and organizing thinking
- Seeing the forest for the trees

(Ozonoff, 1991; Hughes, 1994; Hill, 2004; Mesibov, Shea, & Schopler 2004)

Managing complexity

Kenworthy et al, 2005
What do organization/integration deficits look like?

Can’t, or Won’t?

• Disorganized language
• Literal language
• Asks for lots of structure in new situations
• Gets stuck on details- doesn’t let go of small mistake/inconsistency
• Dominates discussions without knowing it
• Behaves worse in unstructured groups
• Doesn’t set goals
• Trouble learning from mistakes
• Poor written expression, Doesn’t get good ideas onto paper
• Draw meaning from a reading assignment
• Know what to study for on a test
Disorganization Risks and Accommodations

Lack of generalization
- Put new information in familiar context
- Explicitly review inferences, nuances
- Teach in the setting where the behavior is expected
- Structure

Difficulty knowing what is important/Getting Stuck on details
- Emphasis on goals
- Break things down
- Explicit short rules, recipes, checklists and routines
- Structure

Don’t show what they know
- Study guides, closed format tests
- Writing rubrics
- Structure

Lack of awareness and overwhelm
- Safe Person
- Structure

Schopler, Mesibov & Hearsey, 1995
The Power of a Safe Person
Russell Lehmann & David Apkarian @ STORYCORPS
Detail Processor Strengths

- Patience for details
- Respect, follow, use rules
- Good with recipes, checklists and routines
- Powerful computer related thinking
- Classification strengths
- Attention to detail—Sherlock Holmes
- Mastery of detailed datasets
- Large Vocabulary
Initiate
Working Memory
Planning
Organization
Task Monitor

Inhibit
Self-Monitor

Flexibility
Emotional Control
Planning

• Video of young girl completing the Tower of London Task
The Importance of Inner Speech

Social context

Language
↓
Self directed speech
↓
Self regulation
↓
Executive control

(Luria, 1961)

Lev Vygotsky
Thinking and Speech (1934)
Inner Speech and Planning

Poor planning/Inner Speech/Working Memory Looks Like: Won’t follow directions, work independently

- Talk Less, Write More: White Boards
- Use technology for tracking tasks, calendar, writing
- Communication: e-mail, texting
- Notes
- Computer-based curricula
- Socratic method

Schopler, Mesibov & Harsey, 1995
Break it Down and Make it Visual

John has a book I want

- Hit John, take book
  - Time out - Miss TV time
  - Was this what I wanted?

- Ask John for a turn
  - Look at book, give it back, get TV time
  - Was this what I wanted?
GOAL: Increase your understanding of executive functions and how to enhance them

PLAN

1. What are Executive Functions (EF)?
   - EFs are fractionated and plastic

2. Why do they matter?
   - EFs are necessary for effective everyday functioning

3. How is EF expressed in autism?
   - Flexibility, Organization, Planning/Working Memory

4. How can we treat EF problems in autism?
   - Phenotype specific accommodations & teaching self regulatory scripts in everyday settings
Teaching Executive Function Skills
OR... bridging the dissociation between knowing and doing

The Challenge:
• EF is a complex set of abilities
• Self regulation is hardest when it is most needed
• EF skills are hard to generalize
• You can’t teach “doing” without doing

The Strategy:
• Phenotype Specific (= Individualized) Treatment
• Accommodate, then remediate
• Teach self regulatory scripts/vocabulary to automaticity
• Embed teaching in the real world: School & Home
• Teach process: Make implicit explicit & Model the skills
• Collaborate: “With, not for”

Accommodate, then Remediate

Neural Diversity is a civil right...

Overwhelmed people can’t learn

- Can’t vs Won’t
- Avoid Overload
- Keep it Positive

- Predictability and structure
- Make Big Picture Explicit
- Talk Less, Write More
Overload: Looks like anxiety, impulsivity, meltdowns
Brenda Smith Myles: *AS and Difficult Moments*
- Consistency across settings
- Memorized, automatic language

Teach and use key scripts and words

- Checklists
- Cues
- White Boards

Use visual supports

- Coach
- Make Implicit Explicit
- Scaffold-fade-generalize

Teach by doing

Make it fun!

- Humor
- Rewards
- Collaborate with child
Unstuck Team

Ivymount Model Asperger Program/Take2 Summer Camp
• Katie Alexander
• Lynn Cannon
• Monica Werner

Children’s National Center for Autism Spectrum Disorders
• Laura Anthony
• Lauren Kenworthy
• John Strang
• Cara Pugliese

Copyright 2011, 2014 Brookes
Tools You Can Use Today
GOAL: Increase your understanding of how to teach executive functions

PLAN
1. Teach flexibility, organization & planning skills using specific scripts or vocabulary and other tools

CHECK
1. Did I get done when I said I would?
2. Do you have questions?
Teaching Executive Function Skills
OR... bridging the dissociation between knowing and doing

The Challenge:

• A student with ASD: “My biggest problem in college has been executive functioning. I’m not organized, I’m late with everything and I don’t know how to get started. My school did a great job of including me in school, but why didn’t anyone teach me this EF stuff?”

• EF skills are hard to generalize (Ylvisaker et al., 2003)

The Strategy:

• Embed teaching in the real world: school & home
• Show, model and coach
- Consistency across settings
- Memorized, automatic language

Teach and use key scripts and words
- Checklists
- Cues
- White Boards

Teach by doing
- Coach
- Make Implicit Explicit
- Scaffold-fade-generalize

Use visual supports
- Humor
- Rewards
- Collaborate with child

Make it fun!
- Coach
- Consistency across settings

Teach and use key scripts and words
Scaffold  
Fade  
Generalize

http://www.bianys.org/learnet
Unstuck and On Target!

Introduction
- Guide to Using This Manual

Topic 1
- The Meaning of Flexibility

Topic 2
- Cognitive Flexibility Defined

Topic 3
- Coping Strategies

Topic 4
- Personal Heroes

Topic 5
- Why Be Flexible?

Topic 6
- Your Goals: Getting What You Want

Topic 7
- Scripts for How to Be Flexible

Topic 8
- Journey to Target Island

Topic 9
- Being Flexible Makes You a Good Friend

Topic 10
- Flexible Futures
The Story of Silly Putty (Why, Plan A/Plan B)
Photo credits to Maurice Tome
http://schoolwithinschool.org/look-forward-to-succeeding/

During WWII, there was a shortage of rubber...
James Wright, an inventor, wanted to invent a substitute for rubber...
He created a rubber-like substance, however, it could not be used for tires or boots...
The Story of Silly Putty

A few years later, an inventor named Peter Hodgson found the substance and thought it could do a lot of neat things...
The Story of Silly Putty
Teaching: Why Be Flexible

• Advantages of physical flexibility
• The “facts” of life
• What to do when what I want is impossible
• Pie charts: getting part of I want is better than getting nothing at all
Feelings Target
Feelings Target

• Video of Dr. Anthony reviewing the feelings target with Stevie
Feelings Chain

Event
Power is out, can’t watch TV

Feeling
Furious (4)

Action
Yelling  Stomping my feet

How Others Feel
Frustrated

Consequence
Lose dessert

I Feel
More disappointed (5)
Teach How to Be Flexible: Self-Regulatory Scripts

- Avoid too much talking
- Refer to the big picture
- Build an alliance—you’re collaborating!
- Need to be practiced
How to be Flexible: Words and Scripts

**Flexible**
- Great job being flexible

**Unstuck**
- I'm getting stuck on ____, how can I get unstuck?

**Compromise**
- Let's compromise so we both get some of what we want

**Plan A/Plan B**
- What is our plan?
- What is our Plan B?
<table>
<thead>
<tr>
<th>Teacher Goal:</th>
<th>Brady’s Goal:</th>
</tr>
</thead>
<tbody>
<tr>
<td>To go to bus</td>
<td>To keep playing kickball</td>
</tr>
</tbody>
</table>

**Compromise:**
- Play for 20 minutes
- Play the next morning

**Plan:**
1. If Brady finishes check-out before 3:00 he will get 20 minutes of kickball
2. If my bus gets called before 20 minutes I will take the rest of my time the next morning

**Do:** Have we done all the steps to accomplish the goal?

**Check:** How did it go?
An Unstuck Email Exchange:

- **Mon**
  - Dear Ms. Lowrey

- **Tues**
  - Dear Sam

- **Wed**
  - Dear Ms. Lowrey

- **Thurs**
  - Dear Sam
Flexibility Scripts

**Big Deal/Little Deal**
- How can we make this big deal into a little deal?

**Choice/No Choice**
- Is this a no choice situation?

**Handling the Unexpected**
- What will change?
- What will stay the same?
- Why is the change happening?
Modeling Plan A/ Plan B & Little Deal

• Video of School within a school classroom when the teacher is modelling UOT language
Unstuck and On Target Home Practice 10

Your child had their tenth session of Unstuck and On Target today.

Session Summary: Your child learned about the difference between a Big Deal and a Little Deal today in group. A BIG DEAL is a large problem, takes a long time to fix and usually takes a lot of people to solve. A little deal is something that is a small problem, can be fixed quickly and doesn’t take many people to solve.

What you can try at home:

1. Keep in mind that whether or not something is a Big Deal is very personal!
   • Just because something is a Big Deal to you, does not automatically mean that it will be a Big Deal to your child.
     i. For example, it might be a Big Deal to you for the family to go to church together, but it is a Little Deal for your child. Or maybe it is the other way around.
     ii. Maybe it is a Big Deal for your child that they are always on time, but you feel like being 5 minutes late is no Big Deal. Or maybe it is the other way around.

2. Don’t tell your child something is not a Big Deal. Instead, try saying something like this:
   • “It is ok if something feels like a Big Deal. I’ll help you figure out how to turn it into a Little Deal.”
   • “If you have a Big Deal problem you can always ask for help. We all need help with a Big Deal.”

3. Praise your child for asking for help with a Big Deal, or for being able to recognize when something is a Little Deal.
   • “Is this a Big Deal or a Little Deal to you?”
   • “You are right, this does feel like a Big Deal. Let’s figure out who to ask for help.”
### GWPDC script (Goal, Why, Plan, Do, Check)

<table>
<thead>
<tr>
<th>Goal</th>
<th>To have fun at recess</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why</td>
<td>Recess is my free time</td>
</tr>
<tr>
<td>Plan A</td>
<td>Ask Johnny if he wants to play soccer</td>
</tr>
<tr>
<td></td>
<td>(If J says, “no”) Ask Melissa to play soccer</td>
</tr>
<tr>
<td>Plan B</td>
<td>Swing on the swings</td>
</tr>
<tr>
<td>Plan C</td>
<td></td>
</tr>
<tr>
<td>Do</td>
<td>Follow my plans</td>
</tr>
<tr>
<td>Check</td>
<td>Did I meet my goal?</td>
</tr>
<tr>
<td></td>
<td>Which plan worked?</td>
</tr>
<tr>
<td></td>
<td>Would I do it the same or different next time?</td>
</tr>
</tbody>
</table>

©2011, Brookes Publishing, Inc
GWPDC

• Video of Katie Alexander modelling GWPDC with Stevie
Modeling Flexibility Scripts

• **Accidents:** After a child spills something at the dining table, you could say, “When that spilled and was starting to drip on me, I felt like it was a really Big Deal, but then I realized I could make it a Little Deal by mopping it up and you helped clean it up. Thanks.”

• **On a play date or at recess.** When a child wants to play Legos, but his or her friend wants to play a board game: “How can you be flexible and still reach your goal of having fun with your friend?” “Can you compromise and play a board game first and then Legos? Then you will both get what you want in the end, which is better than not getting what you want at all.”

• **Unpopular Chores:** If you got a parking ticket: “Oh, how I wish paying this parking ticket was a choice situation...”
Current Projects and Extensions

• e-Unstuck (3C Institute)
  – SBIR funded by NIMH Develop and test training modules on an e-learning platform

• Middle school version (Strang, PI, OAR)

• High School/transition age (Pugliese, PI, OAR, NIMH KAward)
GOAL: Increase your understanding of how to teach executive functions

PLAN
1. Teach flexibility, organization & planning skills using specific scripts or vocabulary and other tools

CHECK
1. Did I get done when I said I would?
2. Do you have questions?
**e-Unstuck Addresses:** Disparities in Access to Treatment

- Overcomes geographical isolation
- Limits financial constraints
  - raising a child w/ ASD costs ~$3 million more than is typical (Ganz, 2007)
- Reduces time pressure
  - parents of children w/ ASD have less leisure time (Smith, 2010)
- Exponentially increases access
- Diversifies the trainers
## Introduction
Learn how to integrate the Unstuck strategies and skills to give yourself multiple ways to build your child’s flexibility, confidence, and independence.

### Quick Review:

<table>
<thead>
<tr>
<th>Executive Function Insight</th>
<th>Can't, Not Won't Insight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accommodate Insight</td>
<td>Motivate Insight</td>
</tr>
<tr>
<td>Flexibility Words Insight</td>
<td>Identifying Feelings Insight</td>
</tr>
<tr>
<td>Coping Strategies Insight</td>
<td>GWPDC Insight</td>
</tr>
</tbody>
</table>
EF Overview Executive Function Profile

This profile uses your answers about your child to rate their executive function skills. The Frequency of Difficulty column indicates their level of struggle with the executive function. Though your child might be struggling with several executive function skills, we recommend that you focus on one at a time to give you and your child an opportunity to make progress. There's an action tip for each executive function to support your problem solving.

<table>
<thead>
<tr>
<th>Executive Function</th>
<th>Description</th>
<th>Frequency of Difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flexibility</strong></td>
<td>The ability to shift from one thing to the next without getting stuck, adapt to new situations, and adjust to unexpected changes in routine.</td>
<td>High</td>
</tr>
</tbody>
</table>

**ACTION TIP:**
Start talking to your child today about "Plan B." Anytime something doesn't go as expected, say, "We need a Plan B," Create a Plan B anytime you expect Plan A might not work out. Say, "Let's come up with a Plan B before we leave the house."
E-Unstuck engages parents in active learning

- Video of e-unstuck training
HOW WELL DOES IT WORK?
THE PROCESS OF RESEARCHING UOT’S EFFECTIVENESS

Alyssa Verbalis, PhD
Pediatric Neuropsychologist
Clinical Research Program Lead
Center for Autism Spectrum Disorders
Children’s National Health System

School Mental Health Conference, 10/21/17
averbali@childrensnational.org
Participatory Research

- A community-based, participatory approach (Brooke et al., 1986; Israel et al., 1998):
  - engagement with community and policy partners
  - development of the intervention, data collection and analysis plan in collaboration with key stakeholders
  - assessing fidelity in the “real world”
  - ensuring that the formative and summative evaluation data will be shared with others who might benefit from the lessons learned (CDC, 1999)
The test of any intervention is the test of that intervention in a context.

**Efficacy**

**Traditional RCT**
- tx delivery at desired intensity and duration
- Highly trained and supervised in tx
- Restrictive inclusion and exclusion criteria

**Effectiveness**

**Community Practice**
- tx subject to programmatic and funding priorities
- Variable training, supervision, motivation and caseload
- Whoever shows up

*Slide Courtesy of David Mandell*
Pre-RCT Development Process

1. Needs assessment with experts and stakeholders
2. Classroom observations of experts in action
3. Focus groups with school staff, parents, and children to define key elements
4. Feasibility and acceptability trial with direct feedback from students with ASD
5. Skip efficacy altogether
Result: Two Published Manuals

Ivymount Model Asperger Program/Take2 Summer Camp

• Katie Alexander
• Lynn Cannon
• Monica Werner

Children’s National Center for Autism Spectrum Disorders

• Laura Anthony (now UCD)
• Lauren Kenworthy

Copyright 2011, 2014 Brookes
Unstuck

Trial #1:

(NIMH 1 R34 MH083053-01A2)

Randomized controlled effectiveness trial of executive function intervention for children on the autism spectrum

Lauren Kenworthy, Laura Gutermuth Anthony, Daniel Q. Naiman, Lynn Cannon, Meagan C. Wills, Caroline Luong-Tran, Monica Adler Werner, Katie C. Alexander, John Strang, Elgiz Bal, Jennifer L. Sokoloff, and Gregory L. Wallace

1Children’s National Medical Center, Center for Autism Spectrum Disorders, Rockville, MD, USA; 2The George Washington University School of Medicine, Washington, DC, USA; 3Department of Applied Mathematics and Statistics, Johns Hopkins University, Baltimore, MD, USA; 4The Ivmount School, Rockville, MD, USA; 5Laboratory of Brain and Cognition, National Institute of Mental Health, National Institutes of Health, Bethesda, MD, USA

- Interventions delivered at school by school staff with fidelity
- Parent training, teacher training, pull out groups, fidelity monitoring, interventionist supervision
<table>
<thead>
<tr>
<th></th>
<th>Unstuck (n=47)</th>
<th>Social Skills (n=20)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>87%</td>
<td>90%</td>
</tr>
<tr>
<td>White</td>
<td>70%</td>
<td>55%</td>
</tr>
<tr>
<td>On Psychotropic Medication</td>
<td>55%</td>
<td>60%</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>9.49(1.00)</td>
<td>9.58(1.10)</td>
</tr>
<tr>
<td><strong>Mother’s education</strong></td>
<td>1.91(0.88)</td>
<td>1.95(0.76)</td>
</tr>
<tr>
<td><strong>Father’s education</strong></td>
<td>2.04(1.12)</td>
<td>1.95(0.91)</td>
</tr>
<tr>
<td><strong>WASI FSIQ</strong></td>
<td>108.80(18.52)</td>
<td>107.63(17.20)</td>
</tr>
<tr>
<td><strong>ADOS Social+Comm</strong></td>
<td>11.64(3.76)</td>
<td>12.00(4.39)</td>
</tr>
<tr>
<td><strong>ADOS Stereotyped Beh</strong></td>
<td>1.98(1.71)</td>
<td>1.90(1.33)</td>
</tr>
</tbody>
</table>
Effects in the Classroom

Kenworthy/Anthony et al., 2014
WASI Block Design
Higher Score = Better Performance

Cohen’s $d=0.65$

Kenworthy & Anthony et al., 2014
Pre-RCT Development Process

1. Needs assessment with experts and stakeholders
2. Classroom observations of experts in action
3. Focus groups with school staff, parents, and children to define key elements
4. Feasibility and acceptability trial with direct feedback from students
5. Skip efficacy altogether
Unstuck Trial #2: Addressing Disparities Comparative Effectiveness Trial

Stakeholder Advisory Board

Yetta Myrick, Chair
Vivian Jackson
Michael Cordell
Megan Berkowitz
Rosario Paredes
Sara Cooner
Bettrys Huffman
Michael Bloom
Katherine Price
Nancy Van Doren
Molly Whalen
Caroline Butler
Laura Njanga
Daniel Shapiro

Faculty and Staff

Laura Anthony, PI
Lauren Kenworthy, PI
Kristina Hardy
Bruno Anthony
Matt Biel
Alyssa Verbalis
Allison Ratto
Cara Pugliese
John Strang
Catherine Kraper
Lynn Cannon

Kaitlyn Tiplady
Meredith Powers
Jillian Martucci
Katerina Dudley
Chelsea Armour
Sydney Seese
Jonathan Safer
Nicole Kahn
Rocio Mendez
Leah Rothschild
Mary Skapek

PCORI AD-1304-7379
Trial #2

• 3rd – 5th graders (50 with ASD and 100 with ADHD) from three school systems in 21 Title 1 schools.
• Random assignment to Unstuck or Contingency Behavior Management
  – Both target EF/Flexibility
  – Both must be effective
• Adapted interventions for use with (all at once!!):
  – Title 1 schools
  – Either ADHD or ASD
  – Spanish or English speaking families
  – Greater family involvement
  – Strength based, student centered
• School personnel administers treatments in school, plus parent and teacher training
Planned Adaptations for Low Income Families

• Intensive stakeholder input
• User friendly texts with lots of visuals and shorter descriptions
• Real-world examples (not “picking up your dry cleaning”)
• Diverse photos and names used throughout
• Time for practice built into training sessions
• Parent check-ins with a family navigator
• Training sessions scheduled at convenient times with childcare provided
Planned Adaptations for Latino families

• Translation of all materials into Spanish
  – Joint efforts by bilingual team (1 native Spanish speaker and 2 native English speakers)
  – Additional teaching around “difficult to translate” words and concepts
• Use of “charla” model
  – PowerPoints used as handouts, rather than projected, used as discussion guide
  – Emphasis on sharing of parenting experiences
A randomized, clustered, parallel comparative effectiveness design:

- **Randomized** – Schools will be randomly assigned (not kids)
- **Clustered** – Treatments will be delivered by school staff and will be matched for “dose” of intervention and training. *(Also pragmatic).*
- **Parallel** – Follow-up 9 months after they complete treatment to evaluate the maintenance of any gains, thus preventing a cross-over design.
- **Adaptive** – To meet the needs of our community (not parallel after all)
## Demographics at Baseline

<table>
<thead>
<tr>
<th></th>
<th>PATSS</th>
<th>UOT</th>
<th>t/X^2</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASD</strong></td>
<td>N=26</td>
<td>N=22</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age: mean years</strong></td>
<td>9.8 (0.9)</td>
<td>10.0 (0.8)</td>
<td>-0.7</td>
<td>.51</td>
</tr>
<tr>
<td><strong>Sex: % male</strong></td>
<td>100</td>
<td>92</td>
<td>1.7</td>
<td>.18</td>
</tr>
<tr>
<td><strong>FSIQ: mean standard score</strong></td>
<td>97 (12)</td>
<td>100 (15)</td>
<td>-0.8</td>
<td>.40</td>
</tr>
<tr>
<td><strong>Income: mean $1000</strong></td>
<td>123 (105)</td>
<td>80 (58)</td>
<td>-1.8</td>
<td>.09</td>
</tr>
<tr>
<td><strong>Ethno-racial group:</strong></td>
<td><strong>%Hispanic/White/Black/Other</strong></td>
<td>11/61/11/15</td>
<td>36/32/14/18</td>
<td>6.6</td>
</tr>
<tr>
<td><strong>ADHD</strong></td>
<td>N=43</td>
<td>N=55</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age: mean years</strong></td>
<td>9.6 (0.9)</td>
<td>9.5 (0.8)</td>
<td>-0.26</td>
<td>.79</td>
</tr>
<tr>
<td><strong>Sex: % male</strong></td>
<td>74</td>
<td>74</td>
<td>0</td>
<td>.99</td>
</tr>
<tr>
<td><strong>FSIQ: mean standard score</strong></td>
<td>100 (16)</td>
<td>94 (12)</td>
<td>-0.8</td>
<td>.40</td>
</tr>
<tr>
<td><strong>Income: mean $1,000</strong></td>
<td>89 (66)</td>
<td>64 (61)</td>
<td>-1.9</td>
<td>.06</td>
</tr>
<tr>
<td><strong>Ethno-racial group:</strong></td>
<td><strong>%Hispanic/White/Black/Other</strong></td>
<td>37/35/19/9</td>
<td>37/13/31/18</td>
<td>9.9</td>
</tr>
</tbody>
</table>
Which Works Better for ASD?

Proportion of kids who improved to kids who got worse: Fisher=.000**

Proportion of kids who improved to kids who got worse: Fisher=.648
Which Works Better for ADHD?

Comparison of Classroom Observations for ADHD

UOT

Fisher=.000**

CBM

Fisher=.008**
<table>
<thead>
<tr>
<th></th>
<th>CBM</th>
<th>Unstuck</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td><strong>t</strong></td>
<td><strong>Cohen’s d</strong></td>
</tr>
<tr>
<td>Block Design</td>
<td>25</td>
<td>2.67**</td>
</tr>
<tr>
<td>CT Flexibility</td>
<td>24</td>
<td>1.24</td>
</tr>
<tr>
<td>CT Plan</td>
<td>24</td>
<td>1.67</td>
</tr>
<tr>
<td>Class Obs</td>
<td>24</td>
<td>0.78</td>
</tr>
</tbody>
</table>
### Blinded Outcomes Pre-Post Paired Sample t-tests

**ADHD**

<table>
<thead>
<tr>
<th></th>
<th>CBM</th>
<th></th>
<th>Unstuck</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>( t )</td>
<td>Cohen’s ( d )</td>
<td>N</td>
</tr>
<tr>
<td><strong>Block Design</strong></td>
<td>39</td>
<td>1.68</td>
<td>.27 (Small)</td>
<td>49</td>
</tr>
<tr>
<td><strong>CT Flexibility</strong></td>
<td>34</td>
<td>4.00**</td>
<td>.69 (Med)</td>
<td>40</td>
</tr>
<tr>
<td><strong>CT Plan</strong></td>
<td>34</td>
<td>3.53**</td>
<td>.60 (Med)</td>
<td>48</td>
</tr>
<tr>
<td><strong>Class Obs</strong></td>
<td>40</td>
<td>3.32**</td>
<td>.52 (Med)</td>
<td>51</td>
</tr>
</tbody>
</table>
These student or family factors do not relate to classroom outcome:

1. IQ
   - $r = 0.165$
   - $p = 0.055$

2. Age
   - $r = -0.033$
   - $p = 0.69$

3. Income
   - $r = 0.062$
   - $p = 0.495$

4. Race
   - White non-Latino (30%) change the least

5. Language spoken in the home
   - English only (51%) changes the least on CBM
These implementation factors do not relate to classroom outcome:

1. Treatment fidelity
2. # of sessions
3. Role of school-based group leader
4. Parent knowledge gains
Student Feedback

How much did you enjoy the group?
“Not at all” “A little bit” “A lot”

85.1% Rated UOT “A lot”
69.8% Rated CBM “A lot”

* t=2.018, df=128, p=.046
## Parent Feedback

**How much did your child’s school group help your child?**

<table>
<thead>
<tr>
<th>Scale</th>
<th>UOT “Really Helpful”</th>
<th>CBM “Really Helpful”</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>44.1%</td>
<td>25.0%</td>
</tr>
</tbody>
</table>

- Rated UOT: **Really Helpful**
  - Rated CBM: **Really Helpful**
  - t=2.767, df=117, p=.007

**Overall satisfaction?**

<table>
<thead>
<tr>
<th>Scale</th>
<th>UOT “Very Satisfied”</th>
<th>CBM “Very Satisfied”</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>56.7%</td>
<td>44.8%</td>
</tr>
</tbody>
</table>

- Rated UOT: **Very Satisfied**
  - Rated CBM: **Very Satisfied**
  - t=3.015, df=116, p=.003

**How likely are you to use these techniques in the future?**

<table>
<thead>
<tr>
<th>Scale</th>
<th>UOT “Very Likely”</th>
<th>CBM “Very Likely”</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>64.6%</td>
<td>34.1%</td>
</tr>
</tbody>
</table>

- Rated UOT: **Very Likely**
  - Rated CBM: **Very Likely**
  - t=2.055, df=90, p=.043
Unstuck & CBM are feasible and can be delivered with fidelity in low-income schools and with Spanish or English speaking families.

Acceptability + Outcomes + Implementation → Effectiveness
Which should you choose?

<table>
<thead>
<tr>
<th>Target:</th>
<th>ASD</th>
<th></th>
<th>ADHD</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UOT</td>
<td>CBM</td>
<td>UOT</td>
<td>CBM</td>
</tr>
<tr>
<td>Classroom behavior</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Student acceptability</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Parent acceptability</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Problem-solving</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Social Flexibility</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Planning</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
THANK YOU to PCORI and the dedicated school staff, children and families who made this project possible.