# Lessons Learned from an Addressing Disparities Trial of School-Based Executive Function Treatments for ASD and ADHD

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>The participant will be able to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lauren Kenworthy, PhD</td>
<td>describe strategies to identify and engage students who experience disparities in access to treatments</td>
</tr>
<tr>
<td>Allison Ratto, PhD</td>
<td>discuss how to address language and cultural disparities in order to engage more families in school-based treatments</td>
</tr>
<tr>
<td>Laura Anthony, PhD</td>
<td>summarize the research results examining the effectiveness of two Executive Functioning interventions, including effects in academic classrooms</td>
</tr>
<tr>
<td>Bruno Anthony, PhD</td>
<td>Discussant</td>
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</table>

PCORI AD-1304-7379
Reaching the other half: Moving towards symptom-based referral methods to engage more students and families in school-based treatments

Funder: PCORI AD-1304-7379
Conflicts of Interest: Royalties on Unstuck manuals & BRIEF forms.
lkenwort@cnmc.org
Why do we need creative, community-based strategies for ASD/ADHD treatments?

- Few EBPs available, especially few Tier 2
  - Many typically effective techniques do not work as well in ASD
- Poor generalization despite real world needs
- Vast disparities in diagnosis, access to treatment and participation in research
  - Lacking methods to assess community acceptance
- Disenfranchised population
  - Importance of stakeholder input with a focus on appreciation of neurodiversity, empowerment and building on strengths
- Our work represents a shift from a goal of normalization to helping people with ASD/ADHD with the things that they have asked for help with
Disparities in **access to diagnosis & treatment**

Disparities in **outcome** = executive dysfunction

- CDC: Under ascertainment of ASD related to under-identification of low-income/minority children with ASD
- AHRQ: Poor/minority children with ADHD undertreated
- Poverty is bad for executive function
- Executive function (EF) is important to outcomes:
  - Flexibility linked to math skills, language comp, disruptive behavior, depression in ADHD (Roberts, 2014; Sjowall 2014)
  - Flexibility predicts anxiety, aggression, adaptive deficits in ASD (Lawson, 2014; Pugliese, 2015)
Can we improve Flexibility with School Based Tier 2 Interventions: Disparities Comparative Effectiveness Trial

• 3rd – 5th graders (48 with ASD and 98 with ADHD) from three school systems in 21 Title 1 schools.

• Random assignment to revised Unstuck and On Target or adapted 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 administer tx in school, + parent and teacher training
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**

**Participant**
- Whoever shows up

**Clinician**
- Highly trained and supervised in tx

**System**
- tx delivery at desired intensity and duration

**Effectiveness**

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

*Slide Courtesy of David Mandell*
Recruitment Year 1: What didn’t work

• Unknown research assistant calls family and asks: “Does your child have autism or ADHD”
• Recruited 41 participants - 41% of the target
• Everyone is worried
Recruitment Year 2: What Worked

- School staff identified students with flexibility problems like:
  - Problems accepting feedback and criticism
  - Problems handling frustration
  - Problems starting something they don’t want to do
  - Frequent meltdowns
  - Not stopping doing something even after they have been told to stop
  - Problems with shutting down when something is challenging

- And “characteristics of” either ADHD or an Autism Spectrum Disorder
What We Gain When We Don’t Require Previous Diagnosis:
Reach twice as many children

ASD

- Newly Identified: 45%
- Already Identified: 55%

ADHD

- Newly Identified: 49%
- Already Identified: 51%

October 23, 2017
<table>
<thead>
<tr>
<th>Demographics mean (range)</th>
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<tr>
<td></td>
<td>Newly identified (n=21)</td>
<td>Already identified (n=17)</td>
</tr>
<tr>
<td>Child age</td>
<td>9.8 (8.4-11.2)</td>
<td>10.0 (8.8-10.9)</td>
</tr>
<tr>
<td>% male</td>
<td>95.2</td>
<td>94.1</td>
</tr>
<tr>
<td>IQ</td>
<td>100 (79-138)</td>
<td>99 (79-129)</td>
</tr>
<tr>
<td>Parent Ed. (yrs.)</td>
<td>16.0 (12-23)</td>
<td>16.7 (12-25)</td>
</tr>
<tr>
<td>Income/yr ($1000)</td>
<td>112 (14-400)</td>
<td>114 (15-350)</td>
</tr>
<tr>
<td>%English = 2(^{nd}) lang</td>
<td>9.5</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>36.1</td>
</tr>
</tbody>
</table>

|                      | Newly identified (n=36)    | Already Identified (n=35)  |
|                      | 9.4 (8.0-10.8)             | 9.6 (8.1-11.0)             |
|                      | 77.8                      | 80.0                       |
|                      | 97.3 (74-133)             | 96.3 (71-124)              |
|                      | 13.4 (3-21)               | 14.5 (3-23)                |
|                      | 70 (9.6-225)              | 83 (8.7-210)               |
|                      |                           | 17.1                       |
ASD Symptoms Already vs Newly Identified: Parent and Clinician Ratings

**SCQ**
- Parent Rated: [Graph showing a comparison between already and newly identified symptoms]

**ADOS-2 Comparison Score**
- Clinician Rated: [Graph showing a comparison between already and newly identified symptoms]
ADHD Symptoms Already vs Newly Identified: Parent and Clinician Ratings
What We Gain: Intervention Theory

Phenotype vs Diagnostic Specific Intervention
- Targets treatment to those who need it: Individualized Medicine
- Aligns treatment groups with neurobiology
- Reduces false “won’t” attributions
- Expands pool of who you can help
- Clarifies target of treatment for interventionist, parent and participant

Causal Model of Neurodevelopmental Disabilities
- Brain
- Cognition
- Behavior

(Frith, 2001 & Pennington, 2002)
# What We Gain: Demographics

<table>
<thead>
<tr>
<th>Ethnicity/Race</th>
<th>Evaluated (N=170)</th>
<th>Included in Study (N=148)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caucasian/White Non-Hispanic</td>
<td>N=45 (26.5%)</td>
<td>N=44 (29.7%)</td>
</tr>
<tr>
<td>African-American/Black Non-Hisp</td>
<td>N=36 (21.2%)</td>
<td>N=29 (19.6%)</td>
</tr>
<tr>
<td>Asian-American/Arab-American</td>
<td>N=10 (5.9%)</td>
<td>N=9 (6.1%)</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>N=53 (31.2%)</td>
<td>N=47 (31.8%)</td>
</tr>
<tr>
<td>Biracial</td>
<td>N=9 (5.3%)</td>
<td>N=8 (5.4%)</td>
</tr>
<tr>
<td>Other/Unreported</td>
<td>N=17 (10%)</td>
<td>N=11 (7.4%)</td>
</tr>
</tbody>
</table>
What We Gain: Address Disparities and Reach the other half

Reach Children and Families who:

– Not getting services in a clinic
– Have the wrong/no IEP
– Speak the wrong language
– Live in the wrong place
– Have the wrong/no insurance
– Don’t understand or feel comfortable with a diagnostic label
ENGAGING LATINO IMMIGRANT FAMILIES IN SCHOOL-BASED BEHAVIORAL TREATMENTS

The Changing Face of America
How the demographic breakdown of the U.S. has changed
Total U.S. population by race/Hispanic origin

300 million

'60 '70 '80 '90 2000 '10

Other Asian Hispanic Black
White (non-Hispanic)

Pct. among those under 18

Source: Census Bureau

Data on Hispanics in 1960 not available. 1970 Hispanic numbers based on sample.
Latino Youth and Mental Health Care

Rates of Unmet Mental Health Needs

- White: 76%
- Black: 77%
- Latino: 88%

Openness to Mental Health Service Use

- Black: 21% less likely
- Latino: 25% less likely
- Asian: 51% less likely


Barriers to Mental Health Care for Latino Immigrant Families

Accessibility
- Language
- Health insurance
- Fears of deportation

Economic
- Direct costs
- Transportation
- Time off work

Knowledge
- Mental Health
- Development
- Systems of Care

Cultural
- Beliefs
- Comfort with medical providers
- Stigma
Additional Barriers to Clinical Research Participation

- English proficiency required
- Lack of measures
- Less comfort
- Systemic racism
Awareness and adoption of innovation are influenced by multiple factors that influence how an innovation moves through a social network.
## Innovation Factors Affecting Acceptance

<table>
<thead>
<tr>
<th>Factor</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatibility</td>
<td>• Does it fit with my values and needs?</td>
</tr>
<tr>
<td>Complexity</td>
<td>• How easy is it to use?</td>
</tr>
<tr>
<td>Relative Advantage</td>
<td>• What’s the return on investment?</td>
</tr>
<tr>
<td>Trial-Ability</td>
<td>• How easy is it to try out?</td>
</tr>
<tr>
<td>Observability</td>
<td>• Can you see the results?</td>
</tr>
</tbody>
</table>

*Children's National*
Project Overview

- 3rd – 5th graders (with ASD or ADHD) from 22 Title 1 schools in Washington, DC Metropolitan Area
- Comparative effectiveness trial of two executive function interventions (Unstuck and On Target or Contingency Behavior Management)
<table>
<thead>
<tr>
<th></th>
<th>Latino (N=47)</th>
<th>Non-Latino (N=101)</th>
<th>Test statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yearly Net Income</td>
<td>$41,058 (32,304)</td>
<td>$110,664 (79,806)</td>
<td>F(1, 125) = 28.84***</td>
</tr>
<tr>
<td>Parent Education</td>
<td>10.71 (4.36)</td>
<td>15.76 (2.75)</td>
<td>F(1, 137)= 69.00***</td>
</tr>
<tr>
<td>Adults in the Home</td>
<td>2.70 (1.00)</td>
<td>2.06 (.91)</td>
<td>F(1, 137)= 14.03 **</td>
</tr>
<tr>
<td>Children in the Home</td>
<td>2.36 (.99)</td>
<td>2.09 (1.17)</td>
<td>F(1, 137)= 1.75 (ns)</td>
</tr>
<tr>
<td>Prior Clinical Diagnosis</td>
<td></td>
<td></td>
<td>$X^2$ = 1.94 (ns)</td>
</tr>
<tr>
<td>ASD</td>
<td>3</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>ADHD</td>
<td>21</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Other diagnosis</td>
<td>3</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>No prior diagnosis</td>
<td>20</td>
<td>32</td>
<td></td>
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<td>Research Diagnosis</td>
<td></td>
<td></td>
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<td>36</td>
<td>62</td>
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<tr>
<td>Prior Treatment</td>
<td>38 (80.85%)</td>
<td>80 (79.21%)</td>
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<td>Prior Special Education Supports</td>
<td>24 (51.06%)</td>
<td>62 (61.39%)</td>
<td>$X^2$ = 3.79*</td>
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</tbody>
</table>

†p<.10 *p<.05 **p<.01 ***p<.001
Key Strategies Used From the Beginning

- **Stakeholder Advisory Board**
  - All factors!

- **Adaptation and translation of materials**
  - Compatibility
  - Complexity

- **Collaboration with schools**
  - Trial-Ability
  - Observability

- **Minimize logistical barriers**
  - Relative Advantage
  - Trial-Ability
Stakeholder Team Members

- Latina Parent Reviewers
- Cultural Competence Co-PIs
- Bilingual Professional Staff
- Stakeholder Advisory Board
- Bilingual Family Navigator
Translation and Adaptation of Materials

• Reduced treatment length and cost for associated materials
• Introduced parent workbook (English, Spanish)
• Used *charlas* rather than leader-driven sessions

• Spanish translation and adaptation of parent workbook (and measures, as needed)
  – Team of 3 bilingual translators (2 native English-speakers, 1 native Spanish-speaker)
  – Review by bilingual psychiatrist (native English-speaker) and bilingual parent advocates (native Spanish-speakers)
  – Consider reading level, approachability
  – Culturally-responsive vignettes
Collaboration with Schools

- Referral by school staff to treatment
- Using school staff to “sell” the intervention
- Primary intervention provided in school
- Ongoing consultation to school personnel throughout the trial
- School-specific adaptations and control of logistical details
Easing Logistical Barriers

• Scheduled parent trainings at:
  – Convenient times (weekends, evenings)
  – Convenient locations (in the community, accessible by public transit)
  – With free, on-site childcare
Rogers’ DOI Framework Applied Adaptively

- Knowledge
- Persuasion
- Decision
- Implementation
- Confirmation

Back to the drawing board!

Rejecters > Adopters

- Reject
- Accept
Lessons Learned: Knowledge

• Challenges
  – Children lacked prior diagnoses of ASD or ADHD
  – Parents lacked knowledge of ASD/ADHD and community resources

• Response
  – Dropped requirement for prior diagnosis and asked the question later in recruitment
  – Additional psychoeducation incorporated into parent sessions
  – Provided time for parents to share knowledge and experiences
Lessons Learned: Persuasion

• Challenges
  – Parents were not always ready to make immediate decisions about involvement
  – Perceived stigma among family and broader community for seeking diagnosis and/or external support
  – Research process was unfamiliar and frightening

• Responses
  – Recognized *familismo* and adapted research procedures to be open to including extended family members, extending the length of the consent process
  – Extended invitations to additional family and community members
  – Prior participants acted as “intervention ambassadors” through word of mouth
  – Additional information and transparency about the research process
Lessons Learned: Persuasion

• Challenges
  – Family schedules were often in flux
  – Forms and questionnaires were confusing, even when translated

• Responses
  – Stayed in continual contact with families through texting, flexible scheduling, and phone check-ins
  – Provided families with more support, including read-aloud, for completing forms
Lessons Learned: Persuasion

• Challenges
  – Parents lacked knowledge of and access to school supports and staff
  – Families had many competing priorities for their time

• Responses
  – Referrals to bilingual community resources for support with school advocacy
  – Provided time for parents to share knowledge and experiences
  – Value of *personalismo* (personal connections) with study staff in building parent engagement
  – Compensation for parent training attendance
Lessons Learned: Persuasion

• Challenge
  – Parents had no prior experience of children participating in behavioral interventions and improving

• Response
  – Allowed time for parents to share their ongoing experiences with the intervention
  – Family navigator and parent trainers disclosed own experiences of success
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233 children referred

- 170 completed baseline evaluations
  - 148 included in study
    - 7 Spanish= primary language
    - 15 English or other preferred
      \[ \chi^2 = 1.30, ns \]
  - 47 English or other preferred
  - 16 Spanish= primary language
    \[ \chi^2 = .39, ns \]
- 63 not evaluated
  - 22 excluded or withdrew
    - 7 Spanish= primary language
    - 15 English or other preferred
## Parent Engagement

<table>
<thead>
<tr>
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<th>Latino Mean (SD)</th>
<th>Non-Latino Mean (SD)</th>
<th>Test Statistic</th>
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<tbody>
<tr>
<td>Trainings Attended</td>
<td>1.74 (1.44)</td>
<td>2.00 (1.60)</td>
<td>F (1, 146)=.870 (ns)</td>
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</tbody>
</table>

(Range: 0-4)
### Treatment Acceptability

- **Program Satisfaction**
  - Latino: 3.71
  - Non-Latino: 3.16
  - $F(1,115) = 2.79$ (p=0.097)

- **Skill Comfort**
  - Latino: 3.31
  - Non-Latino: 2.69
  - $F(1,114) = 9.37$ (p=0.003)

- **Manual Helpfulness**
  - Latino: 3.16
  - Non-Latino: 2.73
  - $F(1,115) = 2.79$ (p=0.097)
Thoughts for the Future

- Focus on treatment dissemination

- Maintain the Stakeholder Advisory Board for continued consultation and future research

- This takes a long time! Long-term community partnerships are needed
Thank You!

- Alyssa Verbalis, Ph.D.
- Sydney Seese
- Meredith Powers
- Danica Limon
- Volunteers

- Children, families, and school staff who participated!

This project was supported by Patient-Centered Outcomes Research Institute (PCORI), Addressing Disparities AD-1304-7379 to Children’s National and Georgetown, and National Institutes of Health (IDDRC P30HD040677 and T32 HD046388-01A2) to Children’s National.
Which Works Better for Which Students?: Results from the Comparative Effectiveness Trial

Laura Anthony, PhD

Associate Professor
Dept of Psychiatry, School of Medicine
U of CO Anschutz Medical Center
Pediatric Mental Health Institute
Children’s Hospital Colorado

School Mental Health Conference, 10/20/17

Conflicts of Interest: Royalties on Unstuck manuals

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Community-Based Participatory Research

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

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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

Children's National
Pre-RCT Development Process

1. CBPR; 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

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

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Meagan C. Wills,1 Caroline Luong-Tran,1 Monica Adler Werner,† Katie C. Alexander,‡ John
Strang,1,2 Elgiz Bal,1 Jennifer L. Sokoloff,1 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; †The Ivymount School, Rockville, MD, USA; §Laboratory
of Brain and Cognition, National Institute of Mental Health, National Institutes of Health, Bethesda, MD, USA

Trial #1: (NIMH 1 R34 MH083053-01A2)

- Unstuck (n=47)
- Social Skills (n=20; Baker, 2009)
- Interventions delivered at school by school staff with fidelity
- Parent training, teacher training, pull out groups, fidelity monitoring, interventionist supervision
Effects in the Classroom

Kenworthy/Anthony et al., 2014

Treatment-Blinded Classroom Observations

Percent Improved

Reciprocity
Rule Abidance
Transitions
Gets Stuck
Negativity/Overwhelm
Participates

Social Skills
Unstuck
Study #2: Addressing Disparities Comparative Effectiveness Trial

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>
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<tbody>
<tr>
<td><strong>ASD</strong></td>
<td>N=26</td>
<td>N=22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age: mean years</td>
<td>9.8 (0.9)</td>
<td>10.0 (0.8)</td>
<td>-0.7</td>
<td>.51</td>
</tr>
<tr>
<td>Sex: % male</td>
<td>100</td>
<td>92</td>
<td>1.7</td>
<td>.18</td>
</tr>
<tr>
<td>FSIQ: mean</td>
<td>97 (12)</td>
<td>100 (15)</td>
<td>-0.8</td>
<td>.40</td>
</tr>
<tr>
<td>Income: mean</td>
<td>123 (105)</td>
<td>80 (58)</td>
<td>-1.8</td>
<td>.09</td>
</tr>
<tr>
<td>%Ethno-racial</td>
<td>11/61/11/15</td>
<td>36/32/14/18</td>
<td>6.6</td>
<td>.16</td>
</tr>
<tr>
<td><strong>ADHD</strong></td>
<td>N=43</td>
<td>N=55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age: mean years</td>
<td>9.6 (0.9)</td>
<td>9.5 (0.8)</td>
<td>-0.26</td>
<td>.79</td>
</tr>
<tr>
<td>Sex: % male</td>
<td>74</td>
<td>74</td>
<td>0</td>
<td>.99</td>
</tr>
<tr>
<td>FSIQ: mean</td>
<td>100 (16)</td>
<td>94 (12)</td>
<td>-0.8</td>
<td>.40</td>
</tr>
<tr>
<td>Income: mean</td>
<td>89 (66)</td>
<td>64 (61)</td>
<td>-1.9</td>
<td>.06</td>
</tr>
<tr>
<td>%Ethno-racial</td>
<td>37/35/19/9</td>
<td>37/13/31/18</td>
<td>9.9</td>
<td>.04</td>
</tr>
</tbody>
</table>
Project Overview: Intervention Components (matched)

Student Groups:
- ~20 Sessions of intervention
- 6 Interventionist Coaching
- 2 observations of intervention

Classroom:
- Visuals
- 1 Teacher Training
- 4 Teacher Check-ins

Parents:
- 4 Parent Training Sessions
- Homework + Parent Workbook
- Visuals
Unstuck & CBM are feasible and can be delivered with fidelity in low-income schools and with Spanish or English speaking families.
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?

0-4 Scale

44.1%  25.0%  **

Rated UOT  "Really Helpful"
Rated CBM  "Really Helpful"

\[ t=2.767, \quad df=117, \quad p=.007 \]
Parent Feedback

Overall satisfaction?

0-4 Scale

56.7%  
Rated UOT “Very Satisfied”  
Range 2-4

44.8%  
Rated CBM “Very Satisfied”  
Range 0-4

**

t=3.015,  
df=116,  
p=.003
Parent Feedback

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

0-4 Scale

64.6%  
Rated UOT
“Very Likely”

34.1%  
Rated CBM
“Very Likely”

* t=2.055, df=90, p=.043
Which Works Better for ASD?

Comparison of Classroom Observations 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**

**CBM**

Fisher=.000**

Fisher=.008**
## Blinded Outcomes Pre-Post Paired Sample t-tests

### ASD

<table>
<thead>
<tr>
<th></th>
<th>CBM</th>
<th>Unstuck</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>t</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>Unstuck</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>t</td>
</tr>
<tr>
<td>Block Design</td>
<td>39</td>
<td>1.68</td>
</tr>
<tr>
<td>CT Flexibility</td>
<td>34</td>
<td>4.00**</td>
</tr>
<tr>
<td>CT Plan</td>
<td>34</td>
<td>3.53**</td>
</tr>
<tr>
<td>Class Obs</td>
<td>40</td>
<td>3.32**</td>
</tr>
</tbody>
</table>
Effect sizes for Fever in Children

<table>
<thead>
<tr>
<th></th>
<th>2 hours</th>
<th>4 hours</th>
<th>6 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaminophen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ibuprofen</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Effect sizes for Fever in Children

<table>
<thead>
<tr>
<th>Drug</th>
<th>2 hours</th>
<th>4 hours</th>
<th>6 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaminophen</td>
<td>.19 (Sm)</td>
<td>.31 (Med)</td>
<td>.33 (Med)</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>.34 (Med)</td>
<td>.81 (Lg)</td>
<td>.66 (Med)</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:

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Treatment fidelity</td>
<td>2</td>
<td># of sessions</td>
</tr>
<tr>
<td>3</td>
<td>Role of school-based group leader</td>
<td>4</td>
<td>Parent knowledge gains</td>
</tr>
</tbody>
</table>
Which should you choose?

<table>
<thead>
<tr>
<th>Target:</th>
<th>ASD</th>
<th>ASB</th>
<th>ADHD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UOT</td>
<td>CBM</td>
<td>UOT</td>
</tr>
<tr>
<td>Classroom behavior</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Student acceptability</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Parent acceptability</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Problem-solving</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Social Flexibility</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
</tr>
<tr>
<td>Planning</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
</tr>
</tbody>
</table>
Effectiveness Summary

• Medium to large effects
• Stakeholder input protects us from mistakes, increased acceptability
• Diversity of sample = increased power
• Committed participants (90% Post testing rate; 70% of parents attended a live training)
• Good real-world generalization
• Easier dissemination and implementation?
THANK YOU
to PCORI and the dedicated school staff, children and families who made this project possible