Improving Public School Services for Children and Youth with ASD

Lisa Ruble
University of Kentucky
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Why Schools?

- Only public funded service provider for children with disabilities
  - For autism, they may be the sole provider for children of low income, minority, or less educated mothers
- More than 500% increase in students served
- High burnout.... National shortage teachers
- Less than 10% of research supported practices used in classrooms
- Three times higher costs for education
- Post-school outcomes are poor compared to students with other disabilities (employment; independence; social)

Hess et al., 2008; Morrier, et al., 2011; Ruble, et al., 2010; Simpson et al., 2011; Stahmer et al., 2005
THE DETAILS

- There are too few well trained, knowledgeable educators for too many ASD students.
- Research indicates that for many students with ASD, IEPs tend to focus on the wrong goals and teaching plans tend to rely on unproven non-evidence based practices.
- Continuing education training to improve practices (workshops) are ineffective and based on outdated methods.
Evidence Based Practices

- “Focused treatments”
- National Professional Development Center
  - http://autismpdc.fpg.unc.edu/

Table 1. Evidence-based practices for children and youth with ASD

- Antecedent-based interventions (ABI)
- Computer-aided instruction
- Differential reinforcement
- Discrete trial training
- Extinction
- Functional behavior assessment
- Functional communication training
- Naturalistic intervention
- Parent-implemented interventions
- Peer-mediated instruction and intervention
- Picture exchange communication system (PECS)
- Pivotal response training
- Prompting
- Reinforcement
- Response interruption/redirection
- Self-management
- Social narratives
- Social skills groups
- Speech-generating devices/VOCA
- Structured work systems
- Task analysis
- Time delay
- Video modeling
- Visual supports
Evidence Based Practice in Psychology - EBPP

Child characteristics, culture, preferences

Clinician/Teacher Assessment, decision-making, treatment planning & implementation

Best available research evidence

EBP

Helps with making decisions
What to teach
How to teach

McGrew, Ruble, & Smith, 2015
Consultation & Coaching

- Consultation is effective and has a “multiplier effect”
  - By supporting teachers, we support an even larger number of students

Busse et al., 1995; Medway & Updyke, 1985; Sheridan et al., 1996
Consultation

• As implementation practice to improve intervention practice
  • Quality of the procedures as delivered by the implementation agent (Consultant)
  • Quality of the strategies as delivered by the intervention agent (Teacher)
Effectiveness of Training Components

<table>
<thead>
<tr>
<th>Components</th>
<th>Knowledge</th>
<th>Skill</th>
<th>Transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study of Theory</td>
<td>10%</td>
<td>5%</td>
<td>0%</td>
</tr>
<tr>
<td>Demonstration</td>
<td>30%</td>
<td>20%</td>
<td>0%</td>
</tr>
<tr>
<td>Practice</td>
<td>60%</td>
<td>60%</td>
<td>5%</td>
</tr>
<tr>
<td>Coaching</td>
<td>95%</td>
<td>95%</td>
<td>95%</td>
</tr>
</tbody>
</table>

Joyce & Showers, 2002
Overview of COMPASS

- Decision-making framework
- Based on assumptions of child-environment interaction as critical
- Proactive problem solving
- Research-supported practices
- Teaching plan is specific to autism
- Forms are specific to autism
- Teaching strategies are linked to each specific skill

Ruble, Dalrymple, & McGrew, 2012
COMPASS Intervention

Initial Consultation
a. Review evidence based programs and COMPASS philosophy
b. Identify personal / environmental challenges & supports
c. Identify goals/ make measurable
d. Develop teaching plans

Coaching Sessions
a. Review videotape of implementation of teaching plans
b. Record progress
c. Adapt teaching plans if necessary

2.5 – 3 hrs
1 – 1.5 hrs
< than 10 hrs
1. How do we assess special education outcomes using group design experimental research?

2. Does COMPASS improve special education outcomes of children with ASD?

3. Can we replicate our findings?
   - Does COMPASS work as well when delivered via Web based technologies?
     - Child goal attainment outcome
     - Fidelity of intervention practice
     - Teacher satisfaction

4. Secondary Questions:
   - How does COMPASS work?
   - What can we learn about process variables such as teacher-student interaction?
   - What teacher and child variables predict positive outcomes?
     - Does COMPASS work equally for all children?

5. Can we successfully adapt COMPASS for transition age youth and achieve similar outcomes?
Integrated Model

Quality (alliance, fidelity)

Implementation Practice
Consultant Behavior
Internal factors (skill, knowledge, personality)
External factors (training, support)

Intervention Practice
Teacher Behavior
Internal factors (skill, knowledge, personality)
External factors (training, support)

Quality (common elements, adherence)

Practice Outcomes
Child Behavior
Internal factors (severity, engagement)
External factors (parents, other support)
How do we assess special education outcomes using group design experimental research?

• How do we experimental treatment studies when
  • Treatment outcomes are often different for each child
  • Children start at different baseline levels
  • The intervention varies, or
  • Norm referenced tests are not sensitive to measuring the goals
• Measurement approach needs to be able to be implemented in community settings
Primary outcome measure

• Goal attainment scaling
  • Allows for assessment when baseline levels, outcomes, interventions vary
  • Primary outcome measure in consultation effectiveness research

• Address core symptoms of autism and pivotal skills
  • Communication
  • Social interaction
  • Learning / work behavior skills
## Goal Attainment Scale

| -2 | Present level of performance |
| -1 | Progress |
| 0  | Expected level of outcome (GOAL) |
| +1 | Somewhat more than expected |
| +2 | Much more than expected |

| Baseline performance level | Partial accomplishment of expected goal performance | Goal accomplishment at the end of the school year | Exceeded accomplishment of expected goal performance | Much surpassed accomplishment of expected goal performance |
Criticisms of GAS

GAS is not standardized.

1. Intervals are not necessarily equal
2. Goal difficulty is not required to be equivalent, and
3. Individual goals are not adjusted or required to meet a specific criterion of measurability
Improvement for Standardized GAS: Psychometric Equivalence Tested (PET)-GAS

Developed protocol to create GAS forms.

Operationalized three dimensions coded by an independent rater:
- Measurability
- Level of Difficulty
- Degree of equidistance between intervals

Ruble, McGrew, & Toland 2012
Study 1: Does COMPASS improve special education outcomes of children with ASD?

- Time 1 Baseline Evaluations
  - Randomization
    - Control (n=17)
    - COMPASS (n=18)
  - Time 2 Goal Attainment Score

NIMH: R34MH07307
Group Comparison

Comparison Group
• Services as usual
• Final evaluation

Intervention Group
• 3 hour COMPASS consultation (parent and teacher)
  • 3 IEP objectives
    • Specific to needs of child with autism
    • Measurable
    • Teaching plans
• 4 teacher coaching sessions (1.5 hour every 4-6 weeks)
• Final evaluation
## Pre-Intervention Between Group Comparisons

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Control</th>
<th>Experimental</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
</tr>
<tr>
<td><strong>Child</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>5.98 (1.5)</td>
<td>6.18 (1.9)</td>
<td>.74</td>
</tr>
<tr>
<td>Childhood Autism Rating Scale</td>
<td>41.43 (8.2)</td>
<td>36.38 (9.9)</td>
<td>.13</td>
</tr>
<tr>
<td>Differential Abilities Scale</td>
<td>39.47 (18.4)</td>
<td>53.78 (27.1)</td>
<td>.08</td>
</tr>
<tr>
<td>Oral and Written Language Scales</td>
<td>41.13 (19.0)</td>
<td>51.56 (17.2)</td>
<td>.10</td>
</tr>
<tr>
<td>Adaptive Behavior Scales</td>
<td>62.29 (9.2)</td>
<td>64.88 (16.7)</td>
<td>.58</td>
</tr>
<tr>
<td>BASC (externalizing composite)</td>
<td>59.53 (8.5)</td>
<td>59.83 (7.0)</td>
<td>.91</td>
</tr>
<tr>
<td><strong>Teacher</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Number of Children Taught</td>
<td>8.85 (11.5)</td>
<td>4.56 (6.1)</td>
<td>.21</td>
</tr>
<tr>
<td>Total Years Autism</td>
<td>8.27 (8.3)</td>
<td>5.34 (5.5)</td>
<td>.25</td>
</tr>
</tbody>
</table>
Findings: GAS Change Scores

GAS Change: \( t(30) = -4.1, p = .000, d = 1.5 \)

Study 2: Can we replicate our findings?

Time 1 Baseline Evaluations

Randomization

Placebo (n=15)  FF COMPASS (n=15)  WEB COMPASS (n=14)

Time 2 Goal Attainment Score

NIMH: RC1MH08976
More Questions

1. Can COMPASS delivered by web-based videoconferencing be made available at multiple school sites reliably?

2. Is COMPASS with coaching sessions delivered via the web effective?

3. Does web-based delivery of COMPASS coaching session work as well as face-to-face delivery of COMPASS coaching sessions?
WEB Group: Teacher Equipment
## Baseline Comparisons

<table>
<thead>
<tr>
<th>Variable</th>
<th>Enhanced Services As Usual (n = 15)</th>
<th>Face-to-Face (n = 16)</th>
<th>Web-Based (n = 18)</th>
<th>F(2, 46)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>DAS¹</td>
<td>61.3</td>
<td>24.6</td>
<td>60.9</td>
<td>17.0</td>
<td>44.6</td>
</tr>
<tr>
<td>OWLS¹</td>
<td>53.8</td>
<td>13.7</td>
<td>57.3</td>
<td>14.7</td>
<td>49.6</td>
</tr>
<tr>
<td>Vineland (TR)¹</td>
<td>58.6</td>
<td>12.8</td>
<td>62.0</td>
<td>13.5</td>
<td>58.3</td>
</tr>
<tr>
<td>Child age (years)</td>
<td>5.6</td>
<td>1.5</td>
<td>6.4</td>
<td>1.6</td>
<td>5.9</td>
</tr>
<tr>
<td>Years teachingᵃ</td>
<td>1.2</td>
<td>2.2</td>
<td>0.9</td>
<td>3.0</td>
<td>2.3</td>
</tr>
<tr>
<td>Students taught</td>
<td>3.6</td>
<td>4.5</td>
<td>9.0</td>
<td>7.3</td>
<td>7.0</td>
</tr>
<tr>
<td>Services received²</td>
<td>1.4</td>
<td>1.4</td>
<td>1.0</td>
<td>1.1</td>
<td>1.7</td>
</tr>
<tr>
<td>Hours of services²</td>
<td>12.3</td>
<td>20.8</td>
<td>5.9</td>
<td>7.0</td>
<td>6.8</td>
</tr>
<tr>
<td>Family incomeᵇ</td>
<td>26.5</td>
<td>21.4</td>
<td>26.9</td>
<td>1.6</td>
<td></td>
</tr>
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</table>
Planned Comparisons of PET-GAS Change Scores

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Unadjusted</th>
<th>Adjusted for DAS scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M_{\text{diff}}$</td>
<td>$SE$</td>
</tr>
<tr>
<td>FF vs. Placebo</td>
<td>3.63</td>
<td>0.92</td>
</tr>
<tr>
<td>WEB vs. Placebo</td>
<td>2.16</td>
<td>0.91</td>
</tr>
<tr>
<td>FF vs. WEB</td>
<td>1.47</td>
<td>0.90</td>
</tr>
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</table>

## Comparison of Group Ratings on Consultant Fidelity

<table>
<thead>
<tr>
<th>Variable</th>
<th>Face-to-Face (n = 16)</th>
<th>Web-Based (n = 18)</th>
<th>t(df)</th>
<th>p</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher ratings of consultant fidelity</td>
<td>23.21 1.95</td>
<td>22.97 2.13</td>
<td>0.34 (968)</td>
<td>.74</td>
<td>0.12</td>
</tr>
<tr>
<td>Parent ratings of consultant fidelity</td>
<td>20.65 4.55</td>
<td>19.62 4.96</td>
<td>0.49 (1,643)</td>
<td>.62</td>
<td>0.22</td>
</tr>
<tr>
<td>Teacher ratings of coaching adherence</td>
<td>3.74 0.27</td>
<td>3.78 0.27</td>
<td>0.42 (227)</td>
<td>.68</td>
<td>0.15</td>
</tr>
</tbody>
</table>
Intervention Practice Fidelity & Satisfaction by Group

### Teacher Adherence by Coaching Session

<table>
<thead>
<tr>
<th>Group</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>FF</td>
<td>3.6</td>
<td>3.4</td>
<td>4.0</td>
<td>4.2</td>
</tr>
<tr>
<td>WEB</td>
<td>3.7</td>
<td>3.7</td>
<td>4.1</td>
<td>4.2</td>
</tr>
</tbody>
</table>

1-5 Likert Scale 1 ‘0%’; 5 ‘100%’
No diff FF and WEB.
Significant difference in adherence ratings across coaching sessions, $\chi^2(3) = 12.39$, $p = .006$, Kendall’s $W = .15$

### Teacher Satisfaction

- Median = 3.7 / 4
- Initial Consult:
  - No difference between FF and WEB groups for teachers, $z = -0.07$, $p = .95$, $r = .01$, and parents, $z = -0.98$, $p = .33$, $r = .19$.
- Coaching:
  - No difference between the WEB ($M = 3.2$, Median = 3.3, $SD = 0.62$) and FF groups ($M = 3.2$, Median = 3.3, $SD = 0.44$), $z = -0.48$, $p = .63$, $r = .09$. 
**COMPASS for Transition Youth**

Complete adapted COMPASS profile
Assessed need for information on services
Provided information

### Initial Consultation
- a. Review evidence based programs and COMPASS philosophy
- b. Identify personal / environmental challenges & supports
- c. Identify goals/ make measureable
- d. Develop teaching plans

### Coaching Sessions
- a. Review videotape of implementation of teaching plans
- b. Record progress
- c. Adapt teaching plans if necessary

Discuss post-secondary goals
IEP goals linked to post-secondary goals
Parent goals for post-secondary outcomes
Update IEP
Student involvement as much as possible
Videotape, work samples, data
Review Parent Progress toward Post-Secondary Goals

1 x 4 hrs
2.5 – 3 hrs

Complete adapted COMPASS profile
Assessed need for information on services
Provided information
## Pretreatment Comparisons

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control (n = 9)</th>
<th>Treatment (n = 11)</th>
<th>Statistic(df)</th>
<th>p</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARS (ST)</td>
<td>37.83 11.41</td>
<td>36.10 7.53</td>
<td>t(6) = 0.26</td>
<td>.80</td>
<td>.179</td>
</tr>
<tr>
<td>CARS (HF)</td>
<td>28.25 3.05</td>
<td>25.42 4.96</td>
<td>t(10) = 1.19</td>
<td>.26</td>
<td>.687</td>
</tr>
<tr>
<td>Vineland (TR)</td>
<td>68.78 16.43</td>
<td>74.27 12.82</td>
<td>t(18) = 0.84</td>
<td>.41</td>
<td>.373</td>
</tr>
<tr>
<td>Vineland (PR)</td>
<td>64.61 15.83</td>
<td>68.82 13.67</td>
<td>t(18) = 0.61</td>
<td>.55</td>
<td>.285</td>
</tr>
<tr>
<td>KBIT-2 IQ</td>
<td>78.22 27.02</td>
<td>73.55 28.26</td>
<td>t(18) = 0.38</td>
<td>.71</td>
<td>.169</td>
</tr>
<tr>
<td>Child age (years)</td>
<td>18.11 1.17</td>
<td>18.27 1.10</td>
<td>t(18) = 0.32</td>
<td>.75</td>
<td>.141</td>
</tr>
<tr>
<td>Services receiveda</td>
<td>0.78 0.83</td>
<td>1.36 1.96</td>
<td>t(14.04) = 0.90</td>
<td>.39</td>
<td>.385</td>
</tr>
<tr>
<td>Hours of servicesa</td>
<td>1.00 2.65</td>
<td>3.73 7.72</td>
<td>t(12.75) = 1.01</td>
<td>.29</td>
<td>.473</td>
</tr>
<tr>
<td>Years teaching</td>
<td>10.39 7.08</td>
<td>13.81 7.99</td>
<td>t(18) = 1.03</td>
<td>.32</td>
<td>.453</td>
</tr>
<tr>
<td>Students taughtb</td>
<td>25.00 25.00</td>
<td>25.10 44.43</td>
<td>t(17) = 0.01</td>
<td>.99</td>
<td>.003</td>
</tr>
<tr>
<td>Family incomec</td>
<td>10.83 10.23</td>
<td></td>
<td>z = 0.24</td>
<td>.82</td>
<td>.003</td>
</tr>
</tbody>
</table>
**Does COMPASS Improve Transition IEP Goal Attainment Outcomes?**


<table>
<thead>
<tr>
<th>Variable</th>
<th>Control</th>
<th>Treatment</th>
<th>t(df)</th>
<th>p</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAS change score</td>
<td>0.82</td>
<td>2.61</td>
<td>5.30(18)</td>
<td>&lt;.001</td>
<td>2.41</td>
</tr>
<tr>
<td>GAS final score</td>
<td>1.94</td>
<td>3.61</td>
<td>4.69(18)</td>
<td>&lt;.001</td>
<td>2.11</td>
</tr>
</tbody>
</table>
Two New Studies

1. Develop and validate a training program on COMPASS for school or community-based ASD consultants (NIH) (McGrew, Snell-Rood, & Toland)

2. Adapt and test a special education teacher burnout intervention (IES) (McGrew, Salyers, and Westgate)
Acknowledgements:

• Parents and Caregivers
• Students
• School Administrators and Teachers

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• www.ukautism.org

• Co-investigators:
  • John McGrew, IUPUI
  • Nancy Dalrymple
  • Claire Snell-Rood, UC
  • Michelle Salyers, IUPUI
  • Michael Toland, UK

• Research Team
  • Medina Adams, UK
  • Jordan Findley, UK
  • Abbey Love, UK
  • Kahyah Pinkman, UK
  • Venus Wong, UK
  • Madision, Yee, UK
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