Do Common Elements Across EBPs Correlate with Child Engagement and Learning Outcomes?

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International Society of Autism Research 2019
Background

Special education, when implemented well, can have a broad and lasting impact on children with disabilities.

The challenge is to address the research-to-practice gap so that all children with ASD obtain their fullest potential possible from their public school services.

We propose a strategy focusing on common elements for improving the quality and outcomes of school-based interventions.
Common Elements

- Originates from psychotherapy outcomes research
  - When EBPs are compared, there are consistent findings of few differences in effectiveness between therapeutic approaches (Clarkin & Levy, 2004).
  - Because EBPs are more effective than placebo or treatment as usual, there are common therapeutic elements underlying different EBPs linked to effectiveness.
- Similar findings are emerging in ASD educational research.
- National Research Council (2001) described components common across comprehensive effective programs for young children with ASD, such as emphasizing social and communication skills and child engagement.
Boyd and colleagues (2014) conducted a comparative study of outcomes of students with ASD who attended one of three classrooms:

(a) Learning Experiences Alternative Programs (LEAP; Strain & Bovey, 2011),

(b) Treatment and Education of Autistic and Related Communication-handicapped Children (TEACCH; Mesibov et al., 2004) or

(c) high-quality special education classroom.

Results showed no differential effects on young children’s outcomes.
“It is not the unique features of the models that most influence child gains; instead it is the common features of the models that most influence child growth.”

(Boyd et al., 2014, p. 378)
Evidence-based educational instruction includes teaching elements common across different approaches as well as specific elements of the chosen evidence-based practice.

AT least 27 EBPs in ASD (NPDC-ASD)

Prompting and reinforcement underlie several EBPs in general and are EBPs themselves.
Teaching Sequence

Set occasion to demonstrate skill / response

- Establish attention
- Present information
- Give task direction
- Wait for child to respond
- Provide feedback for correct / incorrect response
**Context**

COMPASS is a consultation intervention that builds capacity through a multiplier effect.

In three randomized controlled trials of COMPASS, effect sizes from child goal attainment scores ranged between 1.1 and 2.0 (Ruble et al., 2010; 2013; 2018).

A common elements frame can support community trainers and guide the development of key elements of intervention plans.

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**Dunst et al. 2012**
Evidence Based Practice in Psychology - EBPP

Helps with making decisions
What to teach
How to teach
Research Questions

1. What is the natural variation in the implementation of the common elements across teachers?
2. Are the common elements used as a sequence?
3. Does adherence to the common elements improve with coaching?
4. Is adherence to common elements related to student engagement and student goal attainment outcomes?
COMPASS Overview

Initial Consultation
- Initial goal setting and intervention planning consultation with parent and teacher
- Update the IEP with new / refined goals in social, communication, learning skills

Coaching
- Develop Goal Attainment Scale to monitor student outcomes
- Coach teacher on implementation of intervention plans using adherence and student progress monitoring
CETs is an observational measure

Coded teacher behavior obtained from a RCT of COMPASS.

- Data came from 29 teachers of children with ASD (3-8 yrs) from the first and final coaching (out of 4) sessions.
- For coaching, teachers provide videotapes of their implementation of intervention plans.
- Children with ASD fall across the spectrum; 30% in general ed; 30% in a combination of special and general ed; 30% full time special education
  - Mean IQ = 53.7 (20.6)
  - Mean Adaptive Behavior = 60.5 (13.5)
Common Elements of Teaching Sequences

Interrater reliability was good as indicated by:

- Holsti’s (1969) coefficient of reliability (CR) across all items and coders (93.9%),
- Cohen’s (1960) kappa ($k$) for individual items ranging from 1 to .82, and
- Spearman’s rho for item two of .81.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>RESPONSE FORMAT</th>
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| 1. Child is engaged in meaningful goal-directed activity             | 1 = No  
2 = Yes |
| 2. Teacher / environment solicits the student’s attention at the start and throughout the teaching sequence | 1 = Poor  
2 = Somewhat  
3 = Good |
| 3. Teacher / peer makes initial request, or environment is set up clearly, in format the child can understand | 1 = No  
2 = Yes |
| 4. Teacher / peer provides sufficient time (3-5 seconds) for the student to perform the target skill after the initial request | 1 = No  
2 = Yes |
| 5. Teacher / peer provides sufficient time (3-5 seconds) following each prompt to perform the target skill is provided | 1 = No  
2 = Yes |
| 6. Teacher provides clear reinforcement for completing the skill or correction | 1 = No  
2 = Yes |
The summed score of the items was used (alpha = .86).

Scores were based on direct observation of child progress toward IEP goals (ICC=.90-.99) by a blinded rater.
Results
Natural Variability in Use of Common Elements at Coaching 1 and 4

- **CHILD ENGAGED IN A MEANINGFUL ACTIVITY**
  - Coaching 1: 38%
  - Coaching 4: 65%
  - p = .33

- **TEACHER OR ENVIRONMENT OBTAINED THE STUDENT’S ATTENTION AT THE START AND MAINTAINED IT THROUGHOUT**
  - Coaching 1: 6.9%
  - Coaching 4: 31%
  - p = .001

- **TEACHER / PEER MADE INITIAL REQUEST, OR ENVIRONMENT IS SET UP CLEARLY, IN FORMAT CHILD COULD UNDERSTAND**
  - Coaching 1: 97%
  - Coaching 4: 100%
  - p = .57

- **TEACHER PROVIDED SUFFICIENT TIME (3-5 SEC) FOR THE STUDENT TO PERFORM THE TARGET SKILLS AFTER THE INITIAL**
  - Coaching 1: 51.7%
  - Coaching 4: 40%
  - p = .05

- **SUFFICIENT TIME (3-5 SEC) FOLLOWING EACH PROMPT TO PERFORM THE TARGET SKILL WAS PROVIDED**
  - Coaching 1: 3%
  - Coaching 4: 27.5%
  - p = .001

- **TEACHER PROVIDED CLEAR REINFORCEMENT FOR COMPLETING THE SKILL**
  - Coaching 1: 20%
  - Coaching 4: 40%
  - p = .57
For internal consistency, results based on Kuder-Richardson Formula 20 for coaching 1 and coaching 4 were .47 and .22.

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<tr>
<th></th>
<th>Activity</th>
<th>Attention</th>
<th>Request</th>
<th>First Wait</th>
<th>Wait</th>
<th>Reinforce</th>
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<tr>
<td>Attention</td>
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<td>.80***</td>
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<td>.36</td>
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<td>Reinforce</td>
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<td>.06</td>
<td>.45*</td>
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Use of Common Elements and Student Engagement and Goal Attainment Outcomes

<table>
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<tr>
<th>COMMON ELEMENTS (CETS)</th>
<th>Coaching 1</th>
<th>Coaching 4</th>
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<tr>
<td>Student Goal Attainment Outcomes (PET-GAS)</td>
<td>.56**</td>
<td>.61**</td>
</tr>
<tr>
<td>Autism Engagement Rating Scale (AERS)</td>
<td>.69**</td>
<td>.61*</td>
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The CETS operationalizes one set of common elements that may be helpful for evaluating teaching quality.

Variability in use of CETS was observed
Teachers use of specific elements of allowing sufficient response time and providing reinforcement was low.

CETS was not internally consistent suggesting teachers may not use the elements as a sequence.

Teacher coaching improved overall use of CETS, except in the area of reinforcement.

Children of teachers demonstrating the use of common elements were more engaged and made more progress toward their goals.

Overall, CETs may be useful for developing and monitoring intervention plans implemented by school practitioners.
Acknowledgements

Jennifer Grisham-Brown of Un of Kentucky
Parent, teachers, students, and school administrators
Funding support: NIMH R34MH073071 and 1RC1MH089760

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