Data-Based Decision Making and the Pyramid Model: Measurement Considerations

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Presentation at the second annual RTI Early Childhood Summit
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Agenda

- Overview of Pyramid Model
- Share Applications of Data-Based Decision Making Across Tiers
- Discuss Measurement Issues
Data-Based Decision Making

- Ongoing process of gathering, analyzing, and evaluating information to guide decisions or actions

- Key components of definition
  - Data collection is ongoing
  - System for analyzing and evaluating information
  - Data help guide decisions or actions
And then the data told me what I had to do...
Two Primary Considerations

- Are we Doing what we Should be Doing?
  - Fidelity of implementation
  - Across or within tiers
  - Unit of analysis considerations

- Is it Making a Difference?
  - Impact
  - Proximal to distal outcomes
  - Unit of analysis considerations
Implementation:
Pyramid Practices
Data Based Decision Making
Pyramid Model

- Tertiary Intervention
- Secondary Prevention
- Universal Promotion
Measuring Implementation Fidelity

- **Fidelity**
  - Extent to which an intervention or program is practiced and set forth as designed

- **Implementation Fidelity**
  - “Dosage”
  - Adherence
  - Quality of Delivery
Data-Based Decision Making: *Classroom-Level* Implementation

- Teaching Pyramid Observation Tool (TPOT)
TPOT

- TPOT was developed to measure the extent to which Teaching Pyramid practices are being implemented in a classroom.
- Provides data that can be used to evaluate status and monitor progress related to implementation of Teaching Pyramid practices.
- Provides information that can be used to identify professional development needs of teachers.
Using the TPOT

- **Observations**
  - Conducted for a minimum of 2 hours
    - Must observe centers or free play and at least one teacher-directed activity
  - Focus of observation is lead teacher’s behavior

- **Interviews**
  - For those practices that cannot be observed in a 2-hour observation
Format of the TPOT

- Three types of Items
  - Environmental items (Items 1-7) - yes/no based on observation
  - Ratings of practices (items 8-22) - ratings based on observation and/or teacher report
  - Red flags (items 23-38) - yes/no based on observation
Environmental Arrangement Items

- Clear boundaries
- Move easily around room
- Lack of large open spaces
- Adequate number of centers
- Materials support play
- Preparation of centers
- Classroom rules
Items Based on Observations and/or Teacher Report

- Schedule and Routines
- Transitions between activities
- Teachers engage in supportive conversations with children
- Promoting children’s engagement
- Teaching children behavior expectations
- Providing directions
- Effective strategies to respond to problem behavior
- Teaching social skills and emotional competencies
- Teaching children to express emotions
- Teaching problem solving
- Supporting friendship skills
Items Scored Based on Teacher Report

- Supporting children with persistent problem behavior
- Communication with families to promote involvement
- Involving families to support social emotional development and addressing problem behavior
- Strategies to build collaborative teaching with other adults
### Promoting children’s engagement

A classroom receives a score of “0” if all behaviors under a score of “1” are not observed.

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>A classroom receives a score of “0” if all behaviors under a score of “1” are not observed.</td>
<td><em>Y</em> <em>N</em> (1.1) Teacher offers general guidance to children to select activities or use materials to promote engagement*</td>
<td><em>Y</em> <em>N</em> (1.2) Teacher provides fun activities that will support the engagement of almost all of the class *</td>
<td><em>Y</em> <em>N</em> (1.3) Teacher communicates with children on eye level almost all of the time *</td>
<td><em>Y</em> <em>N</em> (3.1) Structured large-group (e.g., circle) activities are structured so that children are actively engaged (responding, interacting) almost all of the time</td>
<td><em>Y</em> <em>N</em> (3.2) Teacher assists individual children in selecting center activities and becoming actively engaged*</td>
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**Notes:**
### Teaching children to express emotions

Tell me how you teach or help children learn about emotions. This includes helping children recognize and deal with their own emotions, or recognize and respond appropriately to other’s emotions. Give me some examples of the emotions you teach or help children learn. What strategies do you use? What materials do you use?

Tell me how you teach or help children deal with their anger. What strategies do you use? What materials do you use?

How do you individualize instruction around emotions? Can you give me a few examples?

<table>
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<td><strong>A classroom receives a score of “0” if all behaviors under a score of “1” are not observed</strong></td>
<td><strong>Y</strong> <strong>N</strong> (1.1) Teacher models <strong>R</strong> O and/or labels own emotions appropriate ways to express emotions</td>
<td><strong>Y</strong> <strong>N</strong> (1.2) Teacher uses a <strong>R</strong> O variety of strategies to teach children about emotion words</td>
<td><strong>Y</strong> <strong>N</strong> (3.1) Teacher uses a variety of strategies to <strong>R</strong> O teach children how to recognize emotions in themselves, other children, and adults*</td>
<td><strong>Y</strong> <strong>N</strong> (5.1) Teacher uses a variety of <strong>R</strong> O strategies to teach children how to respond to other children’s emotions</td>
<td><strong>Y</strong> <strong>N</strong> (5.2) Teacher individualizes <strong>R</strong> O instruction on emotions based on children’s developmental needs. Procedures and materials vary across children</td>
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<td><strong>Y</strong> <strong>N</strong> (1.3) Teacher teaches <strong>R</strong> O about a variety of both positive and negative emotions</td>
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* Examples of emotions: happiness, sadness, anger, fear, surprise, etc.
Items 8-22 Scoring

- Score each indicator
  - yes or no
  - not applicable or no opportunity
  - observation or interview (report)

- Assign a score of 0-5 on each item
  - 0 not all indicators under “1” receive a yes
  - 1 all indicators under “1” yes and all indicators under “3” no
  - 2 all indicators under “1” yes and some of “3” yes
  - 3 all indicators under “1” and “3” yes and none of “5”
  - 4 all indicators under “1” and “3” yes and some of “5”
  - 5 all indicators across items scored as yes
Red Flags
Items 23-38

- Represent issues related to teacher training, support, or program practices

- Indicate areas for immediate training

- Scored as yes/no
TPOT Manual

- Created to provide further clarification and increase reliability of observers
- Provides clarification for many indicators within the items (items that are clarified in the manual are noted with an asterisk)
- Provides both examples and non-examples when necessary
## Sample Item and Scoring Notes

### 11. Promoting children’s engagement

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<td>_Y _N (1.1) Teacher offers general guidance to children to select activities or use materials to promote engagement*</td>
<td>_Y _N (3.1) Structured large-group (e.g., circle) activities are structured so that children are actively engaged (responding, interacting) almost all of the time</td>
<td>_Y _N (5.1) Teacher assists individual children who are exhibiting problem behavior within an activity become actively engaged (score N/O if no opportunity to observe) *</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>_Y _N (1.2) Teacher provides fun activities that will support the engagement of almost all of the class</td>
<td>_Y _N (3.2) Teacher assists individual children in selecting center activities and becoming actively engaged*</td>
<td>_Y _N (5.2) Teacher modifies instruction or activity when children lose interest in large- and small-group activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>_Y _N (1.3) Teacher communicates with children on eye level almost all of the time</td>
<td>_Y _N (3.3) Children are provided with multiple opportunities to make meaningful choices within activities (choosing center, choosing how to use materials, choosing where to sit, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notes, definitions, and examples on specific indicators:</td>
<td>(1.1) Examples include the teacher saying: “You could build a tall tower with those blocks” to a group of children who are wandering around the block area.</td>
<td>(1.2) For this indicator to be scored Y, almost all of the class must be engaged almost all of the time. Periods of wait time or activities that do not engage children would score N for this indicator.</td>
<td>(1.3) In order to score a Y on this indicator, teachers must use child-sized chairs or sit on the floor with children during large group time and activities. Teachers must be down on the child’s level most of the time when having conversations, engaging in play, or interacting in any way with the children.</td>
<td>(3.2) An example of a teacher offering materials to promote engagement is if a child is not attending during a large group activity, the teacher could offer a manipulative for that child to hold that goes along with the activity, or the teacher might give that child a specific job during the activity to keep the child engaged. Another example of a teacher guiding a non-engaged child might be during free choice time if a few children are wandering around, the teacher might start up a new fun activity in one of the centers, such as getting out pladoh or bubbles, to attract children to pick a center and get engaged in play.</td>
<td>(5.1) A child might be having difficulty engaging in an activity and exhibiting problem behavior if they are having trouble manipulating materials, interacting with peers, understanding the activity or the expectations for the activity. If this occurs, a teacher should take the necessary steps to either help the child get involved appropriately in the activity or help the child pick a different activity where they could become meaningfully engaged.</td>
</tr>
</tbody>
</table>
Outcomes:
Proximal and Distal
Focus on Child Outcomes

- What to measure?
- How to measure?
- How is what is measured used within a decision-making framework?
- Status versus change over time
  - Without implementation of intervention
  - With implementation of intervention
LEVEL OF DATA COLLECTION

LEVEL OF PYRAMID

UNIVERSAL TARGETED INDIVIDUALIZED

Whyte, 1994
<table>
<thead>
<tr>
<th>LEVEL OF DATA COLLECTION</th>
<th>UNIVERSAL</th>
<th>TARGETED</th>
<th>INDIVIDUALIZED</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIVERSAL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TARGETED</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INDIVIDUALIZED</td>
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Non-Congruent Options for Data Collection
Are We Doing What We Should Be Doing?

Promotion—“Universal” Level

- Establishing nurturing and responsive relationships
- Providing high quality learning environments

- What types of data would help us make informed decisions about whether teachers or caregivers are doing what they should be doing at this level?
What “differences” would we expect if all children [universal] experienced nurturing and responsive relationships and a high quality learning environment?

Example(s)

- Higher levels of engagement with adults, peers, and materials
- Fewer instances of classroom-wide challenging behavior
- Improved social interactions and social competence
- Growth in pre-academic skills
- Other?
Example Applied to

*Universal Level*

of the Pyramid
### Are We Doing What We Should Be Doing?

<table>
<thead>
<tr>
<th>Establishing Nurturing and Responsive Relationships</th>
<th>Gather Data</th>
<th>Analyze Data</th>
<th>Develop Plan</th>
<th>Implement Plan</th>
<th>Evaluate Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Emotional Support Domain score = 2 (range 1 – 7) (below program benchmark=4)</td>
<td>Address classroom emotional support through workshops and coaching</td>
<td>Implement workshops and 8 weeks of coaching for implementation</td>
<td>•CLASS •TPOT items</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Providing High Quality Learning Environments</th>
<th>Gather Data</th>
<th>Analyze Data</th>
<th>Develop Plan</th>
<th>Implement Plan</th>
<th>Evaluate Impact</th>
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<tbody>
<tr>
<td>ECERS</td>
<td>ECERS = 4.5 (meets program benchmark)</td>
<td></td>
<td></td>
<td></td>
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</tr>
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</table>

### Is it Making a Difference?

<table>
<thead>
<tr>
<th>Social-emotional Development</th>
<th>Gather Data</th>
<th>Analyze Data</th>
<th>Develop Plan</th>
<th>Implement Plan</th>
<th>Evaluate Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASQ-SE</td>
<td>Six of 16 children in classroom screen with concerns (below benchmark)</td>
<td>Re-administer ASQ-SE after classroom emotional support strategies are implemented with fidelity</td>
<td>ASQ-SE re-administered 4 weeks after coaching ends</td>
<td>•Fewer children in classroom screen with concerns (benchmark=2)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Challenging Behavior</th>
<th>Gather Data</th>
<th>Analyze Data</th>
<th>Develop Plan</th>
<th>Implement Plan</th>
<th>Evaluate Impact</th>
</tr>
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<tr>
<td>Observe Class-Wide Behavior</td>
<td>In 90 min, 45 high or low intensity challenging behaviors (.5 per min)</td>
<td>Observe again after classroom emotional support strategies are implemented with fidelity</td>
<td>Observe 4 weeks after coaching ends</td>
<td>•In 90 min, 10 instances of high or low intensity challenging behavior (.1 per min)</td>
<td></td>
</tr>
</tbody>
</table>
Are We Doing What We Should be Doing?

Prevention – “Secondary” Level

- Implementing **Targeted** Social-Emotional Supports
  - Providing explicit supports and instruction
  - Offering increased opportunities for support, instruction, practice, and feedback

- What types of data would help us to make informed decisions about whether we are doing what we should be doing at this level?
Is it Making a Difference?

Prevention – Secondary Level

- What “differences” would we expect if some children experienced targeted social-emotional supports?

- Examples
  - Self-regulation
  - Fewer incidences of high or low intensity challenging behavior
  - Expressing and understanding emotions
  - Problem-solving
  - Developing social relationships
  - Other(?)
Example Applied to *Prevention Level* of the Pyramid
<table>
<thead>
<tr>
<th>Are We Doing What We Should Be Doing?</th>
<th>Gather Data</th>
<th>Analyze Data</th>
<th>Develop Plan</th>
<th>Implement Plan</th>
<th>Evaluate Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Targeted Social-Emotional Supports</strong></td>
<td>Social-Emotional Teaching Scripts</td>
<td>Percent correct implementation of social emotional teaching scripts = 50% (target = 80%)</td>
<td>Model and provide opportunities for practice with feedback about social emotional teaching scripts</td>
<td>Coach models and provides opportunities for practice with feedback for 4 weeks</td>
<td>• TPOT items related to social emotional teaching • Changes in percent of teaching script items implemented with fidelity</td>
</tr>
</tbody>
</table>

<table>
<thead>
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<th>Is it Making a Difference?</th>
<th>Gather Data</th>
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</thead>
<tbody>
<tr>
<td><strong>Behavior</strong></td>
<td>Behavior Incident Reports for “Target” Children</td>
<td>Three of 16 children have significant numbers of behavior incidents on daily basis</td>
<td>Collect behavior incident probes daily for “target” children across planned, routine, and child-initiated activities</td>
<td>Behavior incident data collected for “target” children for 3 months</td>
<td>• Behavior incidents decrease for three “targeted” children (benchmark is less than 3 per day)</td>
</tr>
<tr>
<td><strong>Social Relationships</strong></td>
<td>Social initiations progress monitoring measure</td>
<td>Two of 16 children not making adequate progress (slope/level) on progress monitoring measure</td>
<td>Collect progress monitoring monthly probe data for “target” children</td>
<td>Progress monitoring data collected for “target” children for 3 months</td>
<td>• Progress monitoring data show change in slope/level with “target” children moving closer to same-age peers (rate of initiations per min)</td>
</tr>
</tbody>
</table>
Are We Doing What We Should be Doing?

“Tertiary” (Individualized) Level

- Individualized Intensive Interventions
  - Comprehensive interventions
  - Assessment based
  - Skill-building focused
  - Partnerships with families

- What types of data would help us to make informed decisions about whether we are doing what we should be doing at this level?
## Example of Support Plan Checklist

**Brendan’s Support Plan Implementation 1/7 (continued)**

### In Circle Time Activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
<th>Sometimes</th>
</tr>
</thead>
<tbody>
<tr>
<td>In circle time activities, educational staff has the “sit picture” available on the floor in front of Brendan’s spot for Brendan to refer to so that he can self-monitor sitting on his picture during circle time.</td>
<td>Yes</td>
<td>No</td>
<td>Sometimes</td>
</tr>
<tr>
<td>Educational staff and family reads Brendan’s social story on <em>What Do We Do In Circle?</em></td>
<td>Yes</td>
<td>No</td>
<td>Sometimes</td>
</tr>
<tr>
<td>Educational staff refers to Brendan’s social story, <em>What Do We Do In Circle?</em>, to remind him of circle time rules and expectations.</td>
<td>Yes</td>
<td>No</td>
<td>Sometimes</td>
</tr>
<tr>
<td>Educational staff uses a visual mini-schedule in a “first/then” format to teach Brendan the sequence of activities that occur during circle and what the next activity is so that he will transition to after circle.</td>
<td>Yes</td>
<td>No</td>
<td>Sometimes</td>
</tr>
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*Positive Beginnings: Supporting Young Children with Challenging Behavior*
Is it Making a Difference?

Tertiary (Individualized) Level

- What “differences” would we expect if a child experienced tertiary-level intensive support or intervention?
  - Examples
    - Acquisition of targeted skills
    - Reduction in challenging behavior
    - Growth in Level 1 and Level 2 child outcome measures
    - Other?
Mean Percentage of Intervals with Engagement and Challenging Behaviors Across Transition Routines for Brendan

**Baseline**

**Intervention**

- Engagement
- Challenging Behavior
Issues with Secondary and Tertiary Data Based Decision Making: *Implementation Fidelity*

- TPOT is general implementation fidelity assessment of secondary and tertiary strategies but not a targeted measure.

- Likely need additional implementation fidelity tools to examine “Are We Doing What We Should Be Doing?” at secondary and tertiary levels.

- Level 2 and 3 supports or interventions might be similar:
  - Difference is individualization.
  - Dosage”, adherence, and quality of delivery (precision) at Level 3 critical.
Issues with Secondary and Tertiary Data Based Decision Making: *Impacts and Outcomes*

- Secondary and tertiary outcome measures for “Is it Making a Difference?”
  - More frequent
  - Individualized (particularly at tertiary)
  - “Capable” of monitoring progress/sensitivity to change
  - Family involvement important to evaluate impacts across environments

- Issue of “congruent” versus “non-congruent” assessment
Final Thoughts about Data-Based Decision Making

- Desired outcomes are identified
- Goals or benchmarks are established in relation to desired outcomes
- Fidelity of implementation and impacts/outcomes are measured
- Data are summarized and used to:
  - Identify support needs
  - Deliver professional development
  - Make programmatic changes (e.g., playground schedule, program-wide expectations)
  - Implement classroom-level supports or interventions
  - Implement targeted or individualized interventions
  - Problem solve around specific children or issues
- Data collection is an ongoing process
- Data-based decision making is a cyclical process
Measurement Issues
What are measurement challenges we face?

- Identifying effective, efficient, acceptable, feasible, and psychometrically defensible measures
- "Stretching" existing assessment tools
- Developing new measures for use in "RTI" type decision-making frameworks
  - Different technical adequacy criteria?
- Quality assurance with respect to administration of measures and use of data to inform decision making
- "Utility" and "authenticity"
- Unit of analysis and hierarchical data structures
Discussion of Promising Applications and Measures

Yes, I am a data optimist! Why do you ask?
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