What Do We Expect of Treatment Integrity in Early Childhood RTI?

Charlie Greenwood, Sue Sheridan, and Lise Fox

CRIEI 2010
San Diego, CA
Panel Introduction

- Charlie Greenwood, Juniper Gardens Children’s Project, CRTIEC, Kansas City
- Sue Sheridan, Nebraska Center for Research on Children, Youth, Families and Schools, Lincoln
- Lise Fox, Florida Center for Inclusive Communities, Tampa
Agenda

• Introduction of the Topic
• **Challenges in Progress Monitoring and Decision Making**
  - Charlie (25 min)
• **Challenges in Tiered Language and Early Literacy Instruction**
  - Sue (20)
• **Challenges in Tiered Social-Emotional Intervention**
  - Lise (20)
• Discussion (~45)
• Summary and Next Steps
Treatment integrity is:

- The degree that [something] is implemented as intended
- Proof that the intervention has been replicated!
- A moderator of the relationship between treatment and its outcome
- A safeguard preventing false conclusions of treatment effectiveness from being drawn
- An indicator that a treatment has been taught to, implemented by others
- A tool for differentiating treatment A from B
Early Background

• Procedural Reliability – Billingsley et al., 1980

• Treatment Integrity – Peterson et al., 1982

Today

• Implementation Science, the Journal online at http://www.implementationscience.com/

• Toward a Science of Treatment Integrity – School Psych Review Special Issue, December 2009
Wolery’s 3 Functions of Treatment Integrity

• Means of monitoring the occurrence of relevant variables (comprising the treatment)
  - Impacts knowledge of slippage in the implementation of key variables

• Documentation that experimental conditions occurred as planned/described
  - Impacts the strength of the inferences we make about outcomes

• Means of providing information to practitioners about the use of interventions
  - Impacts utilization and adoption
RTI in Early Childhood

- Response to Intervention (RTI) is an emerging approach to the provision of early childhood services.

- Central components of an RTI approach
  - Use of evidence-based practices implemented with fidelity (i.e., Treatment Integrity)
  - Use of multiple levels of support (i.e., Tiers 1, 2, 3)
  - Use of universal screening and progress monitoring measurement

- Exactly how one should develop treatment integrity (TI) measures and use TI data to make decisions regarding EC RTI research and practice is far from clear?
Some of the Challenges in EC RTI Treatment Integrity

• Sometimes our intervention procedures are just not yet explicit enough to be measured
• RTI brings a layered approach to intervention (Tier 1, 2, and 3)
• Information needs to inform each tier and combine to inform the entire approach
• Integrating the overall RTI child measurement architecture of screening, progress monitoring), with TI, and accountability is desired
So -- What do we Expect of EC RTI Treatment Integrity?

1. What challenges are you facing with respect to RTI treatment integrity?

2. How are you using RTI integrity information to inform interpretation of treatment effects?

3. What are the essential psychometric properties (reliability and validity) of treatment integrity measures? Are they any different than for our dependent measures?

4. How should we measure various dimensions of integrity reliably that are beyond dose or adherence?

5. Where to draw the line between integrity versus intervention process measurement?
Challenges and Some Progress (Charlie)

Integrity of:
1. Progress monitoring assessment implemented by practitioners
2. Integrity of intervention decision-making implemented by practitioners
1. Integrity of progress monitoring assessment implemented by programs

- **Challenge** – A clearly specified set of technically sound measures and procedures for practitioners

- **Challenge** – Access and usability by practitioners in local programs
- **Solution** – Website technology for accessing measures, managing staff assessors, and reporting results (http://www.igdi.ku.edu)

- **Challenge** – Measurable indicators of implementation quality
- **Solution** – Data quality indicators that inform areas needing improvement
IGDI Web Technology Makes Procedures Explicit

- Tools that enable program directors to staff, manage, and monitor program wide data collection for all children
- Tools that enable staff members to learn, certify, and conduct assessments
- Tools that enable staff to collect, enter, analyze, and report child data
- Tools that support decision making Online at [http://www.igdi.ku.edu](http://www.igdi.ku.edu)
Web-based, Program-Level Data System Management Model

- Web-based Model
  - Public Access Side
  - Security Protected Side
- Professional Development Support Level
- Management Tools
- Implementation Success
- Data Volume
- Data Quality
Welcome to IGDI's for Infants and Toddlers

This web site is dedicated to assessing the results of early intervention and early childhood special education services provided young children birth through age 3. **Indicators of Individual Growth and Development for Infants and Toddlers (IGDI's)** are a set of measures designed and validated for use by early childhood practitioners and interventionists for the purpose of monitoring children's growth and progress. Unlike standardized tests that are administered infrequently, IGDI's are designed to be used repeatedly by practitioners in order to estimate each child's "rate of growth" over time. The distinctive benefit of this approach is that the information can be used to directly inform intervention design, implementation, and modification at reasonable levels of training, time, and cost.

**News & Information**

*See our clarification regarding use of the Early Communication Indicator for children from diverse language backgrounds*

*Juniper Gardens needs infant and toddler field assessors throughout Kansas*

Read our *Position Description* (requires MS Word) and follow the instructions for application.

**Information for the Barn (toy set used for the ECI)**

- **Recall:** If you purchased your barn before June 17, 2002, it is not included in the recall. If your barn was purchased after that date, please have your barn with you and go to the [Mattel Recall website](http://www.igdi.ku.edu/) to check on the safety of your specific toy.
- **'Hairy' animals:** Fisher-Price has started making the farm animals with synthetic 'hair.' We recommend purchasing
Program-Level Data Quality Indicators

1. Data volume (Is quarterly data being collected universally and repeatedly?)
2. Assessor Training (% of data collected by certified staff)
3. Interobserver Agreement (% of assessments with a reliability check)
4. Appropriate Administration Length (% of assessments at 6 min duration)
5. In-Range, vs. Outlier scores (% of impossibly high scores)
6. Decision making (% of monthly monitoring)
# Data Volume in One State

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Data Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHS Programs Collecting Data</td>
<td>13</td>
</tr>
<tr>
<td>Adult Assessors Collecting Data</td>
<td>183</td>
</tr>
<tr>
<td>Number of Children</td>
<td>1941</td>
</tr>
<tr>
<td>Proportion of Children w/IFSPs</td>
<td>8.6%</td>
</tr>
<tr>
<td>ECI Assessments Collected</td>
<td>5,740</td>
</tr>
<tr>
<td>Effort Duration</td>
<td>~ 2 Years</td>
</tr>
</tbody>
</table>
# Data Quality by Programs in Another State

## Table 2. Implementation Quality Profile by Program within a State

<table>
<thead>
<tr>
<th>Level of Support</th>
<th>Program</th>
<th>% Certified Staff</th>
<th>% Monthly Administrations</th>
<th>% Reliability</th>
<th>% 6 Min Administrations</th>
<th>Number of Outliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (n = 14)</td>
<td>16</td>
<td>93.0</td>
<td>12.0</td>
<td>1.8</td>
<td>100.0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>92.0</td>
<td>7.0</td>
<td>3.5</td>
<td>96.3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>92.0</td>
<td>7.0</td>
<td>0.0</td>
<td>97.9</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>87.0</td>
<td>4.0</td>
<td>1.1</td>
<td>100.0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>86.0</td>
<td>7.0</td>
<td>0.0</td>
<td>99.6</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>73.0</td>
<td>16.0</td>
<td>1.7</td>
<td>98.8</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>69.0</td>
<td>16.0</td>
<td>7.9</td>
<td>98.2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>53.0</td>
<td>9.0</td>
<td>7.4</td>
<td>99.0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>36.0</td>
<td>3.0</td>
<td>20.8</td>
<td>100.0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>20.0</td>
<td>14.0</td>
<td>7.1</td>
<td>94.0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>11.0</td>
<td>2.0</td>
<td>0.0</td>
<td>100.0</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>3.0</td>
<td>5.0</td>
<td>0.0</td>
<td>99.7</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>0.0</td>
<td>10.0</td>
<td>1.0</td>
<td>100.0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>34</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>100.0</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>51.1</td>
<td>8.0</td>
<td>3.7</td>
<td>98.8</td>
<td>3.4</td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td>38.0</td>
<td>5.1</td>
<td>5.7</td>
<td>1.8</td>
<td>8.9</td>
</tr>
<tr>
<td>Min</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>94</td>
<td>0</td>
</tr>
<tr>
<td>Max</td>
<td></td>
<td>93</td>
<td>16</td>
<td>21</td>
<td>100</td>
<td>34</td>
</tr>
</tbody>
</table>
2. Integrity of decision-making implemented by practitioners

- Challenge - Implementing progress monitoring measurement does not mean decision making will be implemented
  - An explicit decision making model designed for practitioners is needed
- Solution - Adopted David Tilley’s model (Iowa Heartland Area Education Agency)

- Challenge - Lack of evidence needed to evaluate a practitioner’s implementation of the model or lack thereof
- Solution - Created an online decision making support tool (the MOD), linked to IGDI progress monitoring data and evidence-based Language Intervention strategies
Making Online Decisions (MOD)

Web-based Practitioner Support Making Data-based Individualization Explicit, Automatic, and More Effective

How does the MOD work?
1. Flags children who are below benchmark on their most recent quarterly ECI screen
2. Helps understand why low performance may be happening
3. Recommends language intervention strategies given a child’s observed performance
4. Checks that the strategies are being implemented by caregivers
5. Reports whether or not the strategies are working; and what to do next
Why Do Home Visitors Need the MOD?

• To promote making intervention changes when progress is not being made
• To facilitate planning a change in early intervention
• To make intervention decision making a routine practice in a program
Prompts and Reports

Children Who Are Off Target in Movement Development and Who Warrant Special Attention

<table>
<thead>
<tr>
<th>Child Name</th>
<th>Movement Development Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jasmine, Jasmine</td>
<td>Slightly Below Benchmark</td>
</tr>
<tr>
<td>Merle, Merle</td>
<td>Slightly Below Benchmark</td>
</tr>
<tr>
<td>Sabyn, Sabyn</td>
<td>Slightly Below Benchmark</td>
</tr>
<tr>
<td>Sidney, Sidney</td>
<td>Slightly Below Benchmark</td>
</tr>
<tr>
<td>Asija, Asija</td>
<td>Below Benchmark</td>
</tr>
</tbody>
</table>

Children Who Are on Target, Slightly Below (≥ -1.0 SD), or Below Benchmark (≥ -1.5 SD) on their Total Movement score based on their latest EMI measurement

The first table below shows the number and percentage of children in each age group whose most recent Total Movement rate is on target, slightly below (-1.0 SD), or below benchmark (-1.5 SD) as indicated by normative benchmarks. Benchmarks are based on the performance of children in previous research.

<table>
<thead>
<tr>
<th>*Age Group</th>
<th>Movement Development Status</th>
<th>On Target</th>
<th>Slightly Below Benchmark</th>
<th>Below Benchmark</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-11 Months</td>
<td></td>
<td>3</td>
<td>100%</td>
<td>0%</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100.0%</td>
</tr>
<tr>
<td>12-23 Months</td>
<td></td>
<td>13</td>
<td>92.9%</td>
<td>0%</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100.0%</td>
</tr>
<tr>
<td>24-35 Months</td>
<td></td>
<td>4</td>
<td>57.1%</td>
<td>42.9%</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100.0%</td>
</tr>
<tr>
<td>36-47 Months</td>
<td></td>
<td>3</td>
<td>75%</td>
<td>25%</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100.0%</td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td>23</td>
<td>82.1%</td>
<td>14.3%</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
</tr>
</tbody>
</table>

*Age of children at their last observation
1. Is There a Problem?

- Yes, if a BELOW BENCHMARK ECI score flagged by the program is also valid
- Invalid if:
  - Interference during the assessment due to friends, siblings, TV
  - Illness, etc.
2. Why is it Happening?
Home Visitor Reviews the Child’s Home Language Environment Online

Why is this happening?

*Part 1: Does the child have a medical problem that might affect his/her language (for example an ear infection, loss of hearing, sinus problem, redness around the ears, or ear tubes)?
- Yes
- No
- Don't Know

*Part 2: Have there been any recent family changes that might affect his/her language (for example a new baby, divorce or separation, new spouse or partner, or other type of change with the primary caregiver)?
- Yes
- No
- Don't Know

*Part 3: Have there been any recent changes in the child’s home or child care environment that might affect his/her language (for example, moving to a new home or day care, or a new language being spoken in the home?)
- Yes
- No
- Don't Know

Next >  Continue Later
3. What Should be Done?

- MOD recommends evidence-based strategies based on child’s observed proficiency
What should be done?

RECOMMENDED STRATEGIES AND ROUTINES FOR OLIVE OYLE

At 20 months of age, Olive Oyle is communicating using up to 1 Gestures and/or 2.5 Vocalizations per minute, so these strategies will focus on encouraging gestures and sounds.

The types of strategies used to promote communication for children at this level include:

- Responding to a child when they make vocalizations like cooing, babbling, or making sounds. This helps a child to learn that when they vocalize they get attention from others
- Showing an interest in what the child is playing with, looking at, or exploring and commenting or labeling the toy or activity
- Expanding on the child's sounds and gestures by saying words so that a child hears the words that are related to objects or activities they are interested in and vocalizing about or gesturing to

In the Language Intervention Tool Kit (Linda K. Crowe, © 2002), these strategies are identified as Preverbal and are described on pages 13 – 21 of the Tool Kit. Specific strategies and activities for children who are using mostly gestures and vocalizations are suggested on the pages listed below for the following routines. Please select one or more of the routines below that you think Olive Oyle's caregiver would be most likely to use:

- Feeding (pp. 13 - 14)
- Diapering (pp. 13, 15)
4. Is it Being Done?

- Checks that strategies are being implemented
**Home Visitor’s First Fidelity Checklist**

After the ECI assessment indicates a need for more frequent monitoring, and you have selected a specific intervention strategy, please check either Yes or No to each step below to indicate whether or not it has been done.

Please only use this checklist the first time you go over the intervention materials. On each visit after this one, use the Home Visitor’s Fidelity Follow-Up Checklist.

<table>
<thead>
<tr>
<th>Child:</th>
<th>Jenny Juniper</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Assessor:</td>
<td>Data Entry. Fake</td>
</tr>
<tr>
<td>*Date of visit:</td>
<td>Dec 01 2006</td>
</tr>
</tbody>
</table>

*These are the strategies and routines you selected. Please delete any that you did not discuss with the caregivers or that the caregivers said they will not use.*

<table>
<thead>
<tr>
<th>*1. Was the person with whom you reviewed the strategies the child’s primary caregiver? (Select ‘No’ if unknown).</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>About how many hours does this person spend with the child a week?</td>
<td>Hours</td>
<td>Unknown</td>
</tr>
<tr>
<td>*2. I explained the concern to the parent/caregiver and showed them the ECI graph</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>*3. I talked to them about how they can help by using the strategy(s) across their daily routines.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>*4. I helped them pick one (1) or two (2) routines in which they could do the strategies.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>*5. I gave them the materials related to the strategies.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>*6. I modeled/demonstrated how the parent/guardian should use the strategy(s).</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>*7. I role-played the strategies together with the parent/caregiver</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>*8. I observed the parent/caregiver perform the strategy(s).</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>*9. I showed them where to record their usage of the strategy(s) on the routines sheet.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>*10. I asked the parent/guardian how they plan on using the strategy(s) across the routines.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>*11. I suggested that they keep the routines sheet and intervention handout in a place they will see it every day.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>*12. I asked if they had any questions.</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**General Comments/Notes**
5. Is It Working?
Is it working?

As you can see by the graph, Johnny Mays's language is showing improvement! Johnny Mays's slope was 0.17, but since the family has been using the language strategies, it has risen to 0.832.

However, because the slope suggests that Johnny Mays will not likely be out of the 'slightly below benchmark' area in at least six months, we recommend that the caregivers continue using the recommended strategies, you continue entering the follow-up checklist data, and continue conducting monthly ECI observations with Johnny Mays.

As Johnny Mays's language continues to improve, we will continue to recommend new strategies that will help to improve this progress. We recommend that you print these strategies and give them to the family or use them along with your regular home visiting program.
Charlie’s Challenge Struggling With

• How to evaluate the quality of a preschool core language and early literacy curriculum?

• What are the key Evidential Indicators of Quality?
  - Explicit scope and sequence of skills taught?
  - Strength of evidence supporting improved child results?
  - Evidence that it can be well implemented?
Charlie's Lessons Learned

- Some aspects of RTI measurement are not yet procedurally explicit, making them hard to measure.
- Implementation of many steps in a procedure overtime often does not leave a product trail that can be evaluated.
- Implementation quality can be tracked for each child and summarized for each home visitor.
- Implementers need support tools that help them carry-out steps, prompt decision making, make complex activities easy and routine.
Sue
Lise
What do we Expect of EC RTI Treatment Integrity?

1. What challenges are you facing with respect to RTI treatment integrity?
2. How do we use RTI integrity information to inform interpretations of treatment effects?
3. What are the essential psychometric properties (reliability and validity) of treatment integrity measures? Are they any different than for dependent measures?
4. How should we measure various dimensions of integrity reliably that are beyond dose or adherence?
5. Where to draw the line between integrity versus intervention process measurement?
Next Steps and Conclusion?