THE EFFICACY, ACCEPTABILITY, & UTILITY OF LINKING ASSESSMENT TO INTERVENTION WITHIN A RESPONSE TO INTERVENTION FRAMEWORK
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How do we select the best intervention?

- Intervention Central, What Works Clearinghouse
- Journals, Publications
- Conferences, Professional Development
Acknowledgments

- UWEC
- Drs. Mary Beth Tusing & Angela Axelrod
- Principals & Staff
- Graduate Assistants
  - Karissa Danes, Amber Zank, Amber McDougal, Kimberlee Maczko
- Research Assistants
  - Christine Schounard, Vinnie Campbell, Christina DeLapp, Karie Wallace, Greta Fenske, Andrew Tiry
- Interventionists
- Students and Parents
Disclosures

- There are many ways to get from Toronto to Tucson
- There are no conflicts of interest, financial or otherwise, associated with this presentation
Presentation Agenda

- Paradigm Shift in School Psychology
- Brief Experimental Analysis of Academics
- The UWEC Model
  - Training others to implement the Model
- Student Outcome Data
  - Reading
  - Math
- Procedural Integrity Data
- Measurement Fidelity Data
- Social Acceptability Data
- Limitations and Take Away Points
Melissa’s Agenda

- Context for the use of BEA
  - Paradigm shift
- BEA as an effective tool for problem analysis and intervention selection
- Implications for practice
- Limitations
Historical Context: Paradigm Shift

- The field of school psychology has evolved
  - Away from a traditional test-and-place model to a problem solving model
  - Away from a primary focus on diagnosing disabilities and toward identifying effective interventions

Reschly, 2008
School Psychologists are Problem Solvers!

WHAT IS PROBLEM SOLVING?
Problem Solving

- Problem defined as a discrepancy between what is expected and what is occurring (performance differs from expectations) (Deno, 1989)
- Problem solving- activities directed at eliminating the discrepancy
- Applying the scientific method to educational practice (Tilly, 2002)
1. **Problem Identification**
   - Is there a problem?
   - Is there a discrepancy between what is expected and what is occurring?

2. **Problem Analysis**
   - Why is it happening?

3. **Designing intervention plans**
   - What is the best solution?

4. **Implementing intervention**
   - Monitoring progress

5. **Problem Solution**
   - Did the intervention work? Is there still a discrepancy?

Tilly, 2008; Deno, 2005
Problem Solving Within RtI

Tier 1
CORE
Primary Prevention:
Schoolwide and classwide instruction

Tier 2
SUPPLEMENTAL
Secondary Prevention:
Intensified, validated intervention

Tier 3
INTENSIVE
Tertiary Prevention:
Further intensified and individualized intervention

~80% of students

~15%

~5%
Assessment within a PS Model

- Focuses on answering questions such as
  - What skills should we teach?
  - How should we teach the skills?
- As opposed to
  - Does the student meet eligibility criteria?
One approach to problem analysis and intervention development:
Brief Experimental Analysis

- Way to test drive different interventions to find one that works for an individual
- Involves introducing brief interventions and measuring immediate impact of those interventions on outcome measures
  - Often CBM
- “Winning” intervention can then be used over an extended time period and its effectiveness can be evaluated
Single case design logic

- Developed from behavior analysis
- Used to demonstrate experimental control within a single participant
  - Did the intervention significantly impact performance?
- Each participant serves as his or her own control
- Not a case study, since all elements except IV are carefully controlled
- Demonstrates functional relationships (i.e., X caused Y) through replications of effect

Kennedy, 2005
Data analysis within single case designs

- **Visual Analysis**
  - Change in level?
  - Change in trend?
  - Change in variability?
  - Across conditions (baseline and interventions)

- Professional judgment as to how much change is deemed significant

- Usually at least three demonstrations of intervention effect are needed to be confident in making causal inferences
BEAs are consistent with the Problem Solving Model
Why is the student struggling?

- **Structural approach**
  - Student difficulties are due to internal, stable traits
  - Traits cannot be manipulated directly
  - e.g., The student struggles with reading because he has a learning disability.
Why is the student struggling?

- **Functional approach**
  - Student difficulties are due to alterable factors within the environment such as what precedes and follows performance of a skill
    - i.e., components of instruction
  - By changing instructional variables, we can change student performance!
Five hypotheses for skill deficits

1. The student does not want to do it
2. The student has not spent enough time doing it
3. The student has not had enough help to do it
4. The student has not had to do it that way before
5. It is too hard

Daly, Witt, Martens & Dool, 1997
Selecting interventions to test

- Daly et al.’s five hypotheses
  - Least to most intrusive
- Instructional Hierarchy (Haring, et al., 1978)
  - Acquisition
  - Fluency
  - Generalization
  - Adaptation
- Teacher observations
How has BEA been used?

- **Oral Reading Fluency**
  - Interventions include: incentive, performance feedback, student passage preview, listening passage preview, repeated reading, phrase drill, easier material
  - Combinations of the above

- **Recent meta-analysis suggests BEA is effective at identifying successful interventions**
  - No assumptions effect size: 2.87
  - 82% non-overlapping data
  - Average increase in WRCM 30

Burns & Wagner, 2008
How has BEA been used?

- **Early Literacy Skills**
  - Letter Sound Fluency, Nonsense word fluency, Word Identification Fluency
  - Many of the same interventions used in reading fluency studies

- **Reading comprehension**
  - Correctly answered comprehension questions
  - Same as fluency interventions
How has BEA been used?

- **Math**
  - Math fact fluency
  - Cover, copy & compare, taped problems, math to mastery

- **Writing**
  - Letter formation
  - boxes, modeling, incentive
How has BEA been used?

- **Different populations of students**
  - Typically developing students
  - Students with learning disabilities
  - English Language Learners
  - Spanish speaking
  - Turkey

- **Different interventionists**
  - Researchers
  - Parents
  - Peer tutors
Training, Use, Acceptability

Survey of school psychologists found

- 70% had little or no training in BEA
- 78% did not use, or used minimally
- Rated about as acceptable a practice as norm referenced assessment
- Potential for increased acceptability and use with increased training

Objectives

- Provide brief academic interventions to students involved in an after-school program
- Train undergraduate students to:
  - Use BEA to link assessment data to intervention
  - Implement evidence-based interventions
  - Accurately collect outcome data
- Develop a program that produces positive outcomes and high consumer satisfaction
Demographics

- **Schools**
  - Two elementary schools
    - At School One, 82% of students qualify for free and reduced lunch.
    - At School Two, 46% of students qualify for free and reduced lunch.
  - Functions within an after-school program

- **Interventionists**
  - Recruit undergraduate students at UWEC
  - Offer monetary incentives
  - Variety of majors & years in school
“Test drive” six different interventions
- Repeated Reading (RR)
- Listening Passage Preview (LPP)
- Sight Words (SW)
- LPP+RR
- SW+RR
- SW+LPP
- SW+LPP+RR
Repeated Reading Checklist

- Sit with the student in a quiet location without too many distractions.
- Have two copies of the passage. “Assessor Copy” with the total number of words is for you, the interventionist. “Student Copy” is for the child.
- Have the student read the entire passage.
- If the student asks for help with any word, read the word aloud. If the student requests a word definition, give the definition.
- When the student has completed the passage, have him or her read the entire passage again.
- Now, have the student read the passage for the third time for ONE minute.
- As he or she reads, follow along and mark incorrect words on your form.
- When the time is up, record the number of correct words per minute at the end of the passage.
Sit with the student in a quiet location without too many distractions.

Have two copies of the passage. “Assessor Copy” with the total number of words is for you, the interventionist. “Student Copy” is for the child.

Say to the student, “Now we are going to read together. I will read first, while you follow along silently with the passage. Then, you read the same passage aloud.”

Read the entire passage aloud while the student reads silently.
- If you are working with a younger or less-skilled reader, you may want to track your progress across the page with your index finger to help the student to keep up with you.

After you are done reading the passage, say to the student, “Now it is your turn to read. If you come to a word that you do not know, I will help you with it.”

Have the student read the passage for ONE minute.

While the student is reading, record the errors on your copy of the story.

If the student commits a reading error or hesitates for longer than 3 – 5 seconds, tell the student the correct word and have the student continue reading.

When the time is up, record the number of correct words per minute at the end of the passage.
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sit with the student in a quiet location without too many distractions.</td>
<td></td>
</tr>
<tr>
<td>Have two copies of the passage. “Assessor Copy” with the total number of words is for you, the interventionist. “Student Copy” is for the child.</td>
<td></td>
</tr>
<tr>
<td>Have one copy of the sight words for the specific passage.</td>
<td></td>
</tr>
<tr>
<td>Work with the student on the sight words.</td>
<td></td>
</tr>
<tr>
<td>• Have the student review the sight words 5 times or until he or she knows the word.</td>
<td></td>
</tr>
<tr>
<td>• How you present the words to the student is up to you. Be creative!</td>
<td></td>
</tr>
<tr>
<td>After reviewing the sight words, have the student read aloud from the passage for ONE minute.</td>
<td></td>
</tr>
<tr>
<td>While the student is reading, record the errors on your copy of the story.</td>
<td></td>
</tr>
<tr>
<td>If the student commits a reading error or hesitates for longer than 3 – 5 seconds, tell the student the correct word and have the student continue reading.</td>
<td></td>
</tr>
<tr>
<td>When the time is up, record the number of correct words per minute at the end of the passage.</td>
<td></td>
</tr>
</tbody>
</table>
Intervention: Repeated Reading

Leah

Correct Words Per Minute (CWPM)


Intervention: Repeated Reading

WSPA Fall 2012 Conference
Training Model

AIC Training Model

Didactic

Performance Feedback

Rehearsal
Training Objectives

1. Interventionists understand the purpose and process of baseline data collection.
2. Interventionists demonstrate correct method of calculating Correct Words Per Minute (CWPM).
3. Interventionists recognize the purpose and importance of progress monitoring and outcome measurement.
Didactic Instruction

50 Minute Training Presentation Includes:

- Evidence-Based Practice
- BEA Background and Procedures
  - Detailed Explanation of Steps
- Method of Progress Monitoring
- Feedback
- Expectations
  - We address relationship-building with students, attention to detail in paperwork, and the importance of communication and professionalism
Example

Video Clip: Didactic Instruction
Progress Monitoring

- Student involvement
- Specific instruction for interventionists on data collection and monitoring
  - Enhances relationship building and student interest
- Continued coaching, practice, integrity checks and feedback is necessary after training
Provide training time for interventionists to practice treatment fidelity through the use of modeling and practice

Modeling: Important component of training model
  - Repetition and feedback still necessary for learning to take place
Feedback

- Audio recorders reviewed weekly
- Written and verbal performance feedback provided to interventionists as needed
  - Immediate
  - Specific
  - Formative
    - Common Examples: Remember to complete HCO passage; time for one minute *exactly*; label and organize paperwork correctly; read passage through entirely, etc.
  - Summative
    - Treatment integrity, child outcomes
Collecting Baseline Data
Example

**Intervention:**
Listening Passage
Preview
Overall Reading Outcome Data
## (Elementary) Student Outcome Data: School #1

<table>
<thead>
<tr>
<th>Student</th>
<th>Baseline Beginning of Semester (Mean CWPM)</th>
<th>Last 3 Weeks Intervention (Mean CWPM)</th>
<th>Baseline End of Semester (Mean CWPM)</th>
<th>Percent Growth (Beginning to End Baseline)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenny</td>
<td>56.6</td>
<td>77</td>
<td>71.3</td>
<td>26%</td>
</tr>
<tr>
<td>Nat</td>
<td>42</td>
<td>49</td>
<td>46.6</td>
<td>11.1%</td>
</tr>
<tr>
<td>Ellen</td>
<td>22</td>
<td>50</td>
<td>28.3</td>
<td>28.8%</td>
</tr>
<tr>
<td>Andrea</td>
<td>29</td>
<td>56</td>
<td>44.3</td>
<td>52.9%</td>
</tr>
<tr>
<td>Frank</td>
<td>104.6</td>
<td>123</td>
<td>114</td>
<td>9%</td>
</tr>
<tr>
<td>Denise</td>
<td>54</td>
<td>88</td>
<td>74.6</td>
<td>38.3%</td>
</tr>
<tr>
<td>Molly</td>
<td>84</td>
<td>105</td>
<td>74.3</td>
<td>-11.5%</td>
</tr>
<tr>
<td>Christina</td>
<td>94</td>
<td>98</td>
<td>95.6</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

WSPA Fall 2012 Conference  
October 2012
## 1. (Elementary) Student Outcome Data: School #2

<table>
<thead>
<tr>
<th>Student</th>
<th>Baseline Beginning of Semester (Mean CWPM)</th>
<th>Last 3 Weeks Intervention (Mean CWPM)</th>
<th>Baseline End of Semester (Mean CWPM)</th>
<th>Percent Growth (Beginning to End)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Craig</td>
<td>59.3</td>
<td>78.8</td>
<td>92</td>
<td>55.1%</td>
</tr>
<tr>
<td>Tina</td>
<td>63.3</td>
<td>101.6</td>
<td>91.3</td>
<td>44.2%</td>
</tr>
<tr>
<td>Kyle</td>
<td>102.3</td>
<td>128</td>
<td>131.3</td>
<td>28.3%</td>
</tr>
<tr>
<td>Pricilla</td>
<td>103.6</td>
<td>117.2</td>
<td>105.3</td>
<td>1.6%</td>
</tr>
<tr>
<td>Ben</td>
<td>73</td>
<td>101.8</td>
<td>98</td>
<td>39.5%</td>
</tr>
<tr>
<td>Jake</td>
<td>61.6</td>
<td>90.8</td>
<td>89.6</td>
<td>45.5%</td>
</tr>
<tr>
<td>Jimmy</td>
<td>73.6</td>
<td>109</td>
<td>93.3</td>
<td>26.8%</td>
</tr>
<tr>
<td>Melody</td>
<td>37</td>
<td>82.8</td>
<td>81</td>
<td>118.9%</td>
</tr>
<tr>
<td>Mandy</td>
<td>31</td>
<td>90.2</td>
<td>84</td>
<td>170.9%</td>
</tr>
<tr>
<td>Brian</td>
<td>91.6</td>
<td>120.6</td>
<td>114.6</td>
<td>25.2%</td>
</tr>
</tbody>
</table>
Interventions for Math Computation Fluency

- Find ways to supplement math curricula
- Target skill development and computation fluency
- Computation fluency
  - Identifying evidence-based strategies
  - Selecting strategies for struggling students
Brief Experimental Analysis & Math

- Conditions
  - Timed Sprint (TS)
  - Contingent Reinforcement (CR)
  - Cover-Copy-Compare (CCC)

- Baseline

- Combinations
• Digits Correct Per Minute (DCPM)

\[ \begin{array}{ccc}
5 & + & 3 \\
& = & 8 \\
5 & + & 6 \\
& = & 11 \\
5 & + & 6 \\
& = & 10 \\
\end{array} \]

1 digit  2 digits  1 digit
<table>
<thead>
<tr>
<th>Baseline</th>
<th>Date:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>-0</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>-8</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>-8</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>-4</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>-2</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>-5</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>-1</td>
<td>4</td>
</tr>
</tbody>
</table>
• We introduced each student to each condition (i.e., intervention) for both addition and subtraction.
• The condition that produced the greatest increase of DCPM over baseline was selected for Experiment 2.
• Multiple high scoring interventions were retested to determine most effective condition.
Results

CK: BEA Addition

<table>
<thead>
<tr>
<th>BSL</th>
<th>TS</th>
<th>CCC</th>
<th>BSL</th>
<th>CR</th>
<th>TS+CCC</th>
<th>TS+CR</th>
<th>BSL</th>
<th>CCC+CR</th>
<th>CCC+CR</th>
<th>TS+CCC+CR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

DCPM

October 2012
Results
BL: BEA Subtraction

DCPM

BL  TS  CCC  BSL  CR  TS+CCC  CR  BSL  CCC+CR  BSL  TS+CCC+CR  TS+CR  TS+CCC+CR  TS+CR  TS+CCC+CR
Extended Analysis

- Highest scoring intervention was used as each student’s selected intervention.
CK: Treatment Subtraction

Baseline

Treatment

DCPM

BSL
CR

Session

1 2 3 4 5 6 7 8 9
BL: Treatment Addition

Baseline

Treatment

DCPM

BSL

CCC+CR

Session
BL: Treatment Subtraction

Baseline

Treatment

DCPM

BSL

TS+CR

Session
Some Take Away Points

- Findings suggest that BEA can be effective in selecting a treatment that increases math fluency in addition and subtraction.
- Each student did not have the same intervention selected for addition that they had selected for subtraction.
- High levels of treatment integrity
Question: What is the consistency of BEA results over time?

- The literature provides little to no guidance
- Compared BEA of Oral Reading Fluency results for students from two different assessment periods conducted four months apart (Schounard & Axelrod, 2012)
# Changes to Empirically-Selected BEA Interventions from October to February

<table>
<thead>
<tr>
<th>Change Description</th>
<th>N</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addition of One Intervention (e.g., RR to SW+RR)</td>
<td>4</td>
<td>(33%)</td>
</tr>
<tr>
<td>Addition of Two Interventions (e.g., RR to SW+LPP+RR)</td>
<td>1</td>
<td>(8.3%)</td>
</tr>
<tr>
<td>Subtraction of One Intervention (e.g., SW+RR to RR)</td>
<td>1</td>
<td>(8.3%)</td>
</tr>
<tr>
<td>Subtraction of Two Interventions (e.g., SW+LPP+RR to RR)</td>
<td>1</td>
<td>(8.3%)</td>
</tr>
<tr>
<td>Changing of Intervention (e.g., RR to LPP)</td>
<td>2</td>
<td>(16%)</td>
</tr>
<tr>
<td>Change</td>
<td></td>
<td>(75%)</td>
</tr>
<tr>
<td>No Change</td>
<td>3</td>
<td>(25%)</td>
</tr>
</tbody>
</table>
Empirically-Selected BEA Interventions Chosen During October and February Assessments

<table>
<thead>
<tr>
<th>Student</th>
<th>October</th>
<th>February</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ally</td>
<td>LPP+RR</td>
<td>SW+LPP+RR</td>
</tr>
<tr>
<td>Carmen</td>
<td>SW+LPP+RR</td>
<td>SW+LPP+RR</td>
</tr>
<tr>
<td>Heather</td>
<td>SW+LPP</td>
<td>SW+LPP+RR</td>
</tr>
<tr>
<td>Drew</td>
<td>SW+LPP+RR</td>
<td>RR</td>
</tr>
<tr>
<td>Donny</td>
<td>RR</td>
<td>SW+RR</td>
</tr>
<tr>
<td>Jacob</td>
<td>LPP+RR</td>
<td>SW+RR</td>
</tr>
<tr>
<td>Molly</td>
<td>RR</td>
<td>RR</td>
</tr>
<tr>
<td>Martin</td>
<td>SW+RR</td>
<td>SW+LPP+RR</td>
</tr>
<tr>
<td>Reina</td>
<td>SW+LPP</td>
<td>SW+RR</td>
</tr>
<tr>
<td>Andrea</td>
<td>LPP+RR</td>
<td>LPP+RR</td>
</tr>
<tr>
<td>Karie</td>
<td>SW+LPP+RR</td>
<td>LPP+RR</td>
</tr>
<tr>
<td>Lori</td>
<td>RR</td>
<td>SW+LPP+RR</td>
</tr>
</tbody>
</table>
Conclusions and Implications

- Findings not surprising
- Suggests practitioners using BEA should consider conducting BEA assessments at least every four months
Training Pre-Service Educators to Implement a BEA Procedure

- Importance of Treatment Integrity
  - Appropriate training of individuals to implement interventions is likely to enhance treatment integrity
  - High treatment integrity is likely to produce larger effects

"How do you know I have a learning disability? — Maybe you have a teaching disability!"
Training: Amber Zank’s Thesis

- Participants: Undergraduate university students
- 3 Training Groups

<table>
<thead>
<tr>
<th>Condition</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Written and Verbal Information, Modeling “Training”</td>
</tr>
<tr>
<td>2</td>
<td>“Training” + Rehearsal</td>
</tr>
<tr>
<td>3</td>
<td>“Training” + Rehearsal + Performance Feedback</td>
</tr>
</tbody>
</table>

What type of training is needed to implement a BEA procedure with high treatment integrity?
Repeated Reading

☐ Sit with the student in a quiet location without too many distractions.

☐ Have two copies of the passages. Passage A with the total numbers of words is for you the interventionist. Passage B for the child should not have numbers or lines on them.

☐ Have the student read the passage through.

☐ If the student asks for help with any word, read the word aloud. If the student requests a word definition, give the definition.

☐ When the student has completed the passage, have him or her read the passage again (a total of 4 times).

☐ During the reading of the passage the 4th time, follow along and mark incorrect words on your form.

☐ When you are done with the passage or time is up, record the number of correct words per minute at the end of the passage.
### Results: Study 1 & Study 2

<table>
<thead>
<tr>
<th>Treatment Condition (Study 1)</th>
<th>Treatment Integrity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Condition 1:</strong> Training</td>
<td>99%</td>
</tr>
<tr>
<td><strong>Condition 2:</strong> Training + Rehearsal</td>
<td>98%</td>
</tr>
<tr>
<td><strong>Condition 3:</strong> Training + Rehearsal + Performance Feedback</td>
<td>99%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment Condition (Study 2)</th>
<th>Treatment Integrity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Condition 1:</strong> Training</td>
<td>99%</td>
</tr>
<tr>
<td><strong>Condition 2:</strong> Training + Rehearsal</td>
<td>99%</td>
</tr>
<tr>
<td><strong>Condition 3:</strong> Training + Rehearsal + Performance Feedback</td>
<td>100%</td>
</tr>
</tbody>
</table>
Implications

- Results add to the research regarding BEA
  - BEA interventions may be implemented with high treatment integrity with as little as a 1-hour initial training
    ▪ Verbal and Written Information, Modeling
- Importance for pre-service educators
  - Minimal training may be all that is needed to accurately implement an evidence-based procedure within an RtI framework
- Next step: training to use data
Did the interventionists deliver the fluency interventions with a high degree of fidelity?

Must consider fidelity data to determine intervention effectiveness

Educator/interventionist effectiveness
## Procedural Integrity Data

<table>
<thead>
<tr>
<th>Student</th>
<th>Percentage Integrity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Craig</td>
<td>100%</td>
</tr>
<tr>
<td>Tina</td>
<td>97.1%</td>
</tr>
<tr>
<td>Kyle</td>
<td>97.8%</td>
</tr>
<tr>
<td>Pricilla</td>
<td>94%</td>
</tr>
<tr>
<td>Ben</td>
<td>94%</td>
</tr>
<tr>
<td>Jake</td>
<td>93.9%</td>
</tr>
<tr>
<td>Jimmy</td>
<td>92.2%</td>
</tr>
<tr>
<td>Melody</td>
<td>98.5%</td>
</tr>
<tr>
<td>Mandy</td>
<td>100%</td>
</tr>
<tr>
<td>Brian</td>
<td>97.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student</th>
<th>Percentage Integrity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kyle</td>
<td>95.5%</td>
</tr>
<tr>
<td>Nathan</td>
<td>97.4%</td>
</tr>
<tr>
<td>Ella</td>
<td>98.5%</td>
</tr>
<tr>
<td>Amy</td>
<td>96.7%</td>
</tr>
<tr>
<td>Henry</td>
<td>97.8%</td>
</tr>
<tr>
<td>Danielle</td>
<td>98.1%</td>
</tr>
<tr>
<td>Mariah</td>
<td>97.1%</td>
</tr>
<tr>
<td>Christina</td>
<td>94.2%</td>
</tr>
<tr>
<td>Sam</td>
<td>95.5%</td>
</tr>
<tr>
<td>Nate</td>
<td>96.7%</td>
</tr>
</tbody>
</table>
# Measurement Fidelity

<table>
<thead>
<tr>
<th>Student</th>
<th>Percentage Agreeability (CWPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keegan</td>
<td>100%</td>
</tr>
<tr>
<td>Naomy</td>
<td>96.2%</td>
</tr>
<tr>
<td>Ethan</td>
<td>97.8%</td>
</tr>
<tr>
<td>Alyssa</td>
<td>98.5%</td>
</tr>
<tr>
<td>Harry</td>
<td>96%</td>
</tr>
<tr>
<td>Devon</td>
<td>98.6%</td>
</tr>
<tr>
<td>Malila</td>
<td>89.9%</td>
</tr>
<tr>
<td>Cheyenne</td>
<td>100%</td>
</tr>
<tr>
<td>CJ</td>
<td>100%</td>
</tr>
<tr>
<td>Austin</td>
<td>99.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student</th>
<th>Percentage Agreeability (CWPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tyler</td>
<td>97.3%</td>
</tr>
<tr>
<td>Kavin</td>
<td>99%</td>
</tr>
<tr>
<td>Peyton</td>
<td>96.2%</td>
</tr>
<tr>
<td>Bayley</td>
<td>98.5%</td>
</tr>
<tr>
<td>Jordon</td>
<td>97.5%</td>
</tr>
<tr>
<td>Jacob</td>
<td>97.2%</td>
</tr>
<tr>
<td>Mandy</td>
<td>98.1%</td>
</tr>
<tr>
<td>Malia</td>
<td>98.7%</td>
</tr>
<tr>
<td>Blaze</td>
<td>98.2%</td>
</tr>
<tr>
<td>Nathan</td>
<td>97.5%</td>
</tr>
</tbody>
</table>
Are treatment goals and outcomes acceptable, socially relevant, and useful? (Kazdin, 1977; Wolf, 1978)

- Highly acceptable interventions are more likely to be used by teachers (Elliot, 1988)

- Perceptions regarding goals, procedures, and outcomes (Lindo & Elleman, 2010)

- Critical when developing and implementing interventions
## Social Validity Data

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean Fall 2011</th>
<th>Mean Sp 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEA would be an acceptable assessment procedure to target a child’s reading fluency problems</td>
<td>4.82</td>
<td>4.83</td>
</tr>
<tr>
<td>Most school staff would recommend BEA when targeting reading fluency problems</td>
<td>4.46</td>
<td>4.58</td>
</tr>
<tr>
<td>BEA would be effective at improving reading fluency</td>
<td>4.64</td>
<td>4.75</td>
</tr>
<tr>
<td>I would recommend BEA to other school staff</td>
<td>4.56</td>
<td>5.0</td>
</tr>
<tr>
<td>BEA would be appropriate for a variety of students</td>
<td>4.10</td>
<td>4.83</td>
</tr>
<tr>
<td>BEA is a fair amount of work for as student to do</td>
<td>4.10</td>
<td>4.50</td>
</tr>
<tr>
<td>BEA takes a reasonable amount of time for school staff to implement</td>
<td>4.10</td>
<td>4.10</td>
</tr>
<tr>
<td>I liked the procedures used in the BEA</td>
<td>4.64</td>
<td>4.58</td>
</tr>
<tr>
<td>Children are motivated to complete the BEA procedures</td>
<td>3.91</td>
<td>3.83</td>
</tr>
<tr>
<td>Overall, BEA would benefit a student’s reading fluency</td>
<td>4.55</td>
<td>4.83</td>
</tr>
</tbody>
</table>
## Acceptability Data from School Staff

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean (1-5 Scale)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students improved their reading fluency as a result of participation in the afterschool reading program</td>
<td>4.78</td>
</tr>
<tr>
<td>The interventionists working with students were effective in improving students’ reading fluency</td>
<td>4.75</td>
</tr>
<tr>
<td>The feedback provided by the interventionist was helpful in planning other interventions for students</td>
<td>4.31</td>
</tr>
</tbody>
</table>
More Social Validity Data

- Asked students “How comfortable are you with the BEA procedures?” (1 to 6 Likert-scale)
  - Spring 2012: 5.36
Implications for Practice

- BEA is an effective tool for deciding which intervention to use, especially in Tier 3
- Evidence is robust for oral reading fluency
  - Other areas need further study
- Addresses research to practice gap
  - We may know what works on average for groups of kids, but we always need to determine what is effective for individuals
- Ongoing progress monitoring is always best practice
- Socially valid practice
Limitations

- **Impact of measurement error on results**
  - Curriculum based measures are generally reliable and valid
  - However, error is always present
  - Standard Error of Measurement for ORF
  - Range: 5-15 WRCM depending on measurement conditions (Christ & Silberglitt, 2007)

- **Professional judgment is always part of analysis in single case design research**
Limitations for Practical Settings

- **Training**
- **Time intensive**
  - May take 45-90 minutes to complete
  - Makes this appropriate for Tier 3
- **Importance of demonstrating experimental control in applied settings**
  - How many demonstrations of experimental effects are needed?
Thanks!