Implementing RtI at the Middle School
sponsored by the NYS RtI TAC

In the middle of difficulty lies great opportunity.

Matthew Burns
University of Missouri

Contributions to Learning – Hattie 2009

- The student \( d = .40 \)
- The school \( d = .23 \)
- The teacher \( d = .49 \)
- The curriculum \( d = .45 \)

Interventions for Children with LD

Reading comprehension 1.13
Direct instruction .84
Psycholinguistic training .39
Modality instruction .15
Diet .12
Perceptual training .08

Special Education

- President’s Commission on Excellence in Special Education
- Reduce paperwork and increase flexibility
- Identify and intervene early
  – Service first and assessment later
- “Those that get counted, count.”
- Use special education staff more effectively

MTSS

The systematic use of assessment data to most efficiently allocate resources in order to enhance learning for all students.

Burns & VanDerHeyden, 2006
Components of MTSS

- Universal Screening
- Monitoring Student Progress
- Tiered Interventions
- Data-Based Decisions

Professional Learning Communities

- Teams of teachers
  - All of those who teach a particular grade level
  - A forum to collectively problem-solve at the school, classroom, and student level (DuFour, Eaker, DuFour, 2005)
- PLCs focus on student data and a culture of collaboration (DuFour, 2005).
- Many do not have common assessments, criteria to judge student proficiency, or a process to collaboratively analyze data (DuFour et al., 2005; Love, 2009).

Data Management Team

- School Psychologist
- Literacy Coach
- SLOWLY remove
Four Purposes of Assessment

Program evaluation: How is the education system working for students overall?
• State test

Screening: Which of my students are not meeting grade level expectations given Universal Instruction?
• E.g., MAP

Diagnostic: What are the specific needs of students who struggle with reading or math?
• E.g., measures of specific skills

Monitoring Progress: What does the student’s growth look like?
• E.g., CBM

<table>
<thead>
<tr>
<th>Screener</th>
<th>MAP 15th %ile</th>
<th>MAP 25th %ile</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Reading Fluency (ORF)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ORF &lt; Benchmark Goal</td>
<td>276</td>
<td>145</td>
<td>421</td>
</tr>
<tr>
<td>ORF ≥ Benchmark Goal</td>
<td>A</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>322</td>
<td>646</td>
<td>968</td>
</tr>
<tr>
<td>Fluency and Proficiency (F&amp;P)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F&amp;P &lt; Benchmark Goal</td>
<td>90</td>
<td>189</td>
<td>279</td>
</tr>
<tr>
<td>F&amp;P ≥ Benchmark Goal</td>
<td>A</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>367</td>
<td>567</td>
</tr>
</tbody>
</table>

Sensitivity = \( \frac{a}{a + c} \) = .86 for ORF and .31 for F&P,
Specificity = \( \frac{d}{b + d} \) = .78 for ORF and .66 for F&P,
Overall Correct Classification = \( \frac{a + d}{N} \) = .80 for ORF and .54 for F&P

Fluency (actually rate)

<table>
<thead>
<tr>
<th>Grade</th>
<th>R-CBM</th>
<th>Maze</th>
<th>State Test</th>
<th>( \gamma )</th>
</tr>
</thead>
<tbody>
<tr>
<td>3rd</td>
<td>3165</td>
<td>114.5</td>
<td>42.8</td>
<td>1.482.7</td>
</tr>
<tr>
<td>5th</td>
<td>3233</td>
<td>142.8</td>
<td>44.5</td>
<td>1.590.9</td>
</tr>
<tr>
<td>7th</td>
<td>528</td>
<td>180.5</td>
<td>44.0</td>
<td>1.496.5</td>
</tr>
</tbody>
</table>

Note: MAP test was used for first, third, and seventh grade and CBM was used for fourth grade, correlations are corrected for range restriction

Fluency (to Comprehension)

CBM-ORF & MAP, MAP, ORF, & Words Their Way

Individual Screening without a Test
• Middle School
  - More than 20% absent
  - Poor behavior/conduct grade
  - Failing math
  - Failing English (Balfanz & Herzog, 2006).
• High School
  - More than 20% absent
  - Course failures
  - Credits earned
  - Grade point average (Allensworth, 2005).
Tiered Interventions

Multi-Tiered Academic Interventions (Burns, Jimerson, & Deno, 2007)

Tier I: Universal screening and progress monitoring with quality core curriculum: All students,

Tier II: Standardized interventions with small groups in general education: 15% to 20% of students at any time

Tier III: Individualized interventions with in-depth problem analysis in general education: 5% of students at any time

Problem Solving

• Tier I – Identify discrepancy between expectation and performance for class or individual – is it a classwide problem?
• Tier II – Identify discrepancy for individual. Identify category of problem. Assign small group solution. What is the category of the problem?
• Tier III – Identify discrepancy for individual. Identify causal variable. Implement individual intervention. What is the causal variable?

You’ve Got the Data – Now What?

• Data Management Team
  – Usually school psychologist and one other
  – Know data!
• PLC or Discipline Teams
• Get data to teachers within 2 to 3 days
• Lead data meeting

What is the Class Median?

• Median: the middle value in a list of numbers when the values are arranged from lowest to highest.
• Finding the class median:
  – Order student scores from the lowest to highest value.
  – The score in the middle of the list is the median.
  – If there is an even number of scores, take the average of the middle two scores.

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Literacy in MS/HS


Adolescent Literacy

- Create a literacy plan
- Adopt coherent and rigorous standards
- Assess student needs
- Deliver interventions to struggling readers
- Help teachers learn literacy instruction
- Make a long term commitment


Classwide Intervention

http://kc.vanderbilt.edu/pals/

Procedure

<table>
<thead>
<tr>
<th>Partner Reading</th>
<th>Paragraph Shrinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Stronger reader reads aloud for 5 minutes</td>
<td></td>
</tr>
<tr>
<td>2. The weaker reader reads aloud the SAWX test for 5 minutes</td>
<td></td>
</tr>
<tr>
<td>3. Weaker reader sequences the major events of what has been read for 1 minute</td>
<td></td>
</tr>
<tr>
<td>1. For 5 minutes the stronger reader continues reading new text in the story, stopping after each paragraph to summarize</td>
<td></td>
</tr>
<tr>
<td>2. For 5 minutes the weaker reader continues with the new text, stopping after each paragraph to summarize</td>
<td></td>
</tr>
</tbody>
</table>
Timeline

Collect Data: Pre-test (fluency and comprehension)

- Day 1: Train Students on Set Up Procedures and Partner Reading, Practice Reading for 10 minutes, Error Correction
- Day 2: Train Students on Paragraph Shrinking, Practice Reading for 10 minutes
- Day 3-10: Partner Reading, Paragraph Shrinking 15 minutes every day

Collect Data: Post-test (fluency and comprehension)

Partner Reading

- First Reader reads for 5 minutes.
- Second Reader reads the same text for 5 minutes.
- Second Reader retells for 1 minute.

RULES
- Talk only to your partner and only talk about Partner Reading.
- Keep your voice low.
- Help your partner.
- Try your best!

Paragraph Shrinking

- Name the most important who or what.

- Tell the most important thing about the who or what.

- Say the main idea in 10 words or less.

What we found: 3rd grade Partner Reading data

<table>
<thead>
<tr>
<th>Third Grade Benchmark</th>
<th>Pre Intervention Class Median (WRC)</th>
<th>Post Intervention Class Median (WRC)</th>
<th>Slope (WRC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>81</td>
<td>104</td>
<td>11.5</td>
</tr>
<tr>
<td>Class 2</td>
<td>87</td>
<td>115</td>
<td>14</td>
</tr>
</tbody>
</table>

What we found: WRC after PALS

<table>
<thead>
<tr>
<th>Student</th>
<th>WRC</th>
<th>WRC after PALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student 1</td>
<td>48</td>
<td>82</td>
</tr>
<tr>
<td>Student 2</td>
<td>122</td>
<td>145</td>
</tr>
<tr>
<td>Student 3</td>
<td>126</td>
<td>143</td>
</tr>
<tr>
<td>Student 4</td>
<td>82</td>
<td>113</td>
</tr>
<tr>
<td>Student 5</td>
<td>100</td>
<td>116</td>
</tr>
<tr>
<td>Student 6</td>
<td>77</td>
<td>97</td>
</tr>
<tr>
<td>Student 7</td>
<td>51</td>
<td>58</td>
</tr>
<tr>
<td>Student 8</td>
<td>81</td>
<td>85</td>
</tr>
<tr>
<td>Student 9</td>
<td>80</td>
<td>82</td>
</tr>
<tr>
<td>Student 10</td>
<td>100</td>
<td>127</td>
</tr>
<tr>
<td>Student 11</td>
<td>82</td>
<td>102</td>
</tr>
<tr>
<td>Student 12</td>
<td>88</td>
<td>107</td>
</tr>
<tr>
<td>Student 13</td>
<td>100</td>
<td>115</td>
</tr>
<tr>
<td>Student 14</td>
<td>100</td>
<td>115</td>
</tr>
<tr>
<td>Student 15</td>
<td>100</td>
<td>115</td>
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<td>Student 16</td>
<td>100</td>
<td>115</td>
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<td>Student 17</td>
<td>100</td>
<td>115</td>
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<td>Student 18</td>
<td>100</td>
<td>115</td>
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<td>Student 19</td>
<td>100</td>
<td>115</td>
</tr>
<tr>
<td>Student 20</td>
<td>100</td>
<td>115</td>
</tr>
<tr>
<td>Student 21</td>
<td>100</td>
<td>115</td>
</tr>
<tr>
<td>Student 22</td>
<td>100</td>
<td>115</td>
</tr>
</tbody>
</table>

Slope (WRC):
- Class 1: 11.5
- Class 2: 14

Median:
- 87
- 113
What we found: 3rd grade Partner Reading data

<table>
<thead>
<tr>
<th>Third Grade Class 1</th>
<th>Students Below Benchmark Pre Intervention</th>
<th>Students Below Benchmark Post Intervention</th>
<th>Total Students in Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total: 20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total: 23</td>
</tr>
</tbody>
</table>

Tier 2 Problem Analysis

**Category of the Deficit**

**TIER II INTERVENTIONS**

**Recommendation 1.** Provide explicit vocabulary instruction. **Source:** 1485 KB  
**Level of Evidence:** Strong

**Recommendation 2.** Provide direct and explicit comprehension strategy instruction. **Source:** 1485 KB  
**Level of Evidence:** Strong

**Recommendation 3.** Provide opportunities for extended discussion of text meaning and interpretation. **Source:** 1485 KB  
**Level of Evidence:** Moderate

**Recommendation 4.** Increase student motivation and engagement in literacy learning. **Source:** 1485 KB  
**Level of Evidence:** Moderate

**Recommendation 5.** Make available intensive individualized interventions for struggling readers that can be provided by qualified specialists. **Source:** 1485 KB  
**Level of Evidence:** Strong
Grade Level Team Meeting

- Is there a classwide problem?
- Who needs Tier 2?
- Did we miss anyone?
- What should we do for Tier 2?
- Should we go to Tier 3?

National Reading Panel

- Is phonemic awareness instruction effective in helping children learn to read?
- Reviewed 52 studies of PA instruction.
- Three general outcomes were explored
  - PA tasks such as phoneme manipulation,
  - spelling,
  - and reading tasks such as word reading, pseudoword reading, reading comprehension, oral text reading, reading speed, time to reach a criterion of learning, and miscues

National Reading Panel Results

- PA instruction demonstrated better efficacy over alternative instruction models or no instruction
- Improved PA measures (strong), reading ($d = .53$) and spelling skills
- Teaching one or two PA skills was preferable to teaching three or more
- PA instruction benefited reading comprehension (Ehri et al.).

Means and Ranges of Effect Sizes by Reading Outcome Measure

<table>
<thead>
<tr>
<th>Measure</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pseudowords</td>
<td>24</td>
<td>.84</td>
<td>.80</td>
<td>-.19</td>
<td>3.60</td>
</tr>
<tr>
<td>Words in Isolation</td>
<td>48</td>
<td>.92</td>
<td>.89</td>
<td>-.05</td>
<td>4.33</td>
</tr>
<tr>
<td>Contextual Reading</td>
<td>24</td>
<td>.37</td>
<td>.38</td>
<td>-.37</td>
<td>1.18</td>
</tr>
</tbody>
</table>

Assess 4 NRP Areas

- Phonemic Awareness
  - NA at secondary setting
- Phonics
  - Word attack - WJ
- Fluency
  - Oral reading fluency or Test of Silent Contextual Reading Fluency
- Vocabulary/Comprehension

Category of Problem MN HS

- 9-12 with approximately 1600 students
- 69.2% pass reading
- 9th-10th grade
- 28% low on MAP (~225)
- 45% low on TOSCRF (~100)
  - 64% low on phonics (~65)
  - 36% acceptable phonics (~36)
Groups

- Randomly assigned to two groups
  - Read 180
  - Targeted (phonics – REWARDS, fluency – Read Naturally, comprehension – Read 180)
- Wait list control group
- 20 minutes each day for 13 weeks in addition to reading and study skills

Interventions

- Phonics – Rewards
- Fluency – Read Naturally
- Vocabulary/Comprehension
  - Read On!
  - Reading Advantage
  - Thinking Readers

Engagement

- Academic
  - credit hours completed & GPA
- Cognitive
  - Self-regulation and perceived value of learning
- Psychological
  - Sense of belonging and identification with the school (Appleton et al., 2006).

Measuring Cognitive and Psychological Engagement

- Student Engagement Instrument (SEI; Appleton et al., 2006)
  - 35-item self-report measure
- Fredericks et al. (2011)
  - Review of several measures of student engagement

Engagement Intervention

- Tier 1
- Smaller class sizes, extended class time through block scheduling, extended periods, advisory periods, and encouraged participation in extracurricular activities (Dynarski et al., 2008).
Engagement Intervention

• Tier 2

• Check & Connect
  (http://checkandconnect.org/)

Secondary Setting

• 50 minute courses
  – Smaller courses (up to 12 or so)
  – Content area (e.g., Social Studies)

• 90 minute blocks
  – Within course
  – 30 minutes of strategies

Tier II

• Effective – at least moderate ES
• Costs – Low as possible, cost/ES, cost effective (comes with a lot), dedicated teacher time
• Delivery
  – Group/individual (two to six considering efficiency)
  – Total students (20%)
  – Who – teacher supervision with some peer or adult tutoring
  – Pull-out – in addition to, some pull out component, 5 to 5 X/week, approximately 30 minutes (kinder – 20min tops). No less than 8 weeks.
• Grades of kids – earlier better, certainly K-2.
• Measure – fluency measure of reading at least monthly
• Materials
  – Ease – much easier if compiled, but not prerequisite
  – Availability – standardized (manual)

Secondary Setting

• 50 minute courses
  – Smaller courses (up to 12 or so)
  – Content area (e.g., Social Studies)

• 90 minute blocks
  – Within course
  – 30 minutes of strategies

Tier II in Content Course

– Social Studies RTI Class
– Social Studies Class

Engagement Intervention

• Tier 3 - Cognitive
  – Setting personal goals, self-monitoring progress toward goals, and teaching specific strategies to reach personal and academic goals,

• Tier 3 - Psychological
  – Personal relationships with a caring adult or some other mentor, increased participation in group activities, social support combined with appropriately challenging academic work, and a caring and supportive environment (Christenson et al., 2008).
Tier II in Content Course – 1st 30 Minutes

Social Studies RTI Class

Social Studies Teacher

Interventionist

Tier II in Content Course – 2nd 30 minutes

Social Studies RTI Class

Social Studies Teacher

Interventionist

Outcomes

Tier III

Reading Comprehension

- Occurs when the reader develops mental representations of the text and uses them to interpret the text (Pressley & Aflerbach, 1995).

- Critically low among middle- and high-school students (RAND Reading Research Group, 2002).

Comprehension is affected by

1 & 2) Background knowledge and vocabulary

3) Correct inferences about reading

4) Word reading skill

5) Strategy use

(Cromley & Azevedo, 2007)
### Meta-analyses for Interventions

**Kavale & Forness, 2000**

<table>
<thead>
<tr>
<th>Psychological Training</th>
<th>Modality Instruction</th>
<th>Perceptual Training</th>
<th>Auditory Sequential Memory</th>
<th>Visual Sequential Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>.39</td>
<td>.15</td>
<td>.08</td>
<td>.32</td>
<td>.27</td>
</tr>
</tbody>
</table>

### Working Memory

**Melby-Lervåg & Hulme, 2012 – Working Memory**

- Verbal Ability: .13
- Word Decoding: .13
- Arithmetic: .07

"There was no convincing evidence of the generalization of working memory training to other skills (nonverbal and verbal ability, inhibitory processes in attention, word decoding, and arithmetic)."

### Meta-Analysis on Interventions

<table>
<thead>
<tr>
<th>Variable</th>
<th>k</th>
<th>Median Adjusted Hedge's g</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Functioning</td>
<td>3</td>
<td>.09</td>
<td>-50 to .68</td>
</tr>
<tr>
<td>Phonological/Phonemic Awareness</td>
<td>11</td>
<td>.44</td>
<td>.24 to .64</td>
</tr>
<tr>
<td>Verbal Memory</td>
<td>1</td>
<td>.20</td>
<td>NA</td>
</tr>
<tr>
<td>Reading Fluency</td>
<td>11</td>
<td>.43</td>
<td>.29 to .57</td>
</tr>
<tr>
<td>Attention</td>
<td>1</td>
<td>.13</td>
<td>NA</td>
</tr>
<tr>
<td>Mixed</td>
<td>5</td>
<td>.33</td>
<td>.13 to .53</td>
</tr>
</tbody>
</table>

### Instructional Hierarchy:

- **Acquire**: Inaccurate but slow
- **Maintain**: Novel practice opportunities
- **Generalize**: Can apply to novel setting
- **Adoption**: Can use information to solve problems

---

**Learning Process**

1. Acquire
2. Maintain
3. Generalize

---

**Intervention Ideas**

- Acquire
- Maintain
- Generalize
Previewing (Graves et al., 1983)
1. Provide each student the text
2. Provide a synopsis
3. Ask questions about the topic
4. Describe major story elements: setting, characters, point of view (narration), and description of the plot.
5. Present the names and descriptions of main characters
About 15 minutes

Preteach Keyword (Burns et al., 2004)
• Keywords - “central to understanding the meaning of the reading passage” (Rousseau & Yung Tam, 1991, p. 201)
• Preteach with Incremental Rehearsal (Tucker, 1989)
About 7 minutes

Incremental Rehearsal
• Developed by Dr. James Tucker (1989)
• Folding in technique
• Rehearses one new item at a time
• Uses instructional level and high repetition

Results

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Preview</th>
<th>Keyword</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Number of Comprehension Questions Correct</td>
<td>2.95</td>
<td>1.61</td>
<td>4.42</td>
</tr>
<tr>
<td>Questions correct for each Minute of Instructional Time</td>
<td>NA</td>
<td>NA</td>
<td>32</td>
</tr>
</tbody>
</table>

Key Words

Baseline

Miguel

Jessica

Group
Inference

What was Taught

| Teaching inferential questions (Carnine et al., 2004) |
| Determining relationships |
| Relationship stated |
| Relationship not stated |
| Generalize inference rules into reading passages |

Materials

| 4th grade Read Naturally passages and comprehension questions |
| Students independently read passages and answered comprehension questions with support from interventionist |
| Interventionist discussed answers using corrective feedback on errors |

How it was Taught

1. Provide a rule
   - e.g. the more milk you drink, the stronger your bones
2. Provide questions for which the rule is required to find the answer
   - Chris drank one glass of milk. Jeff drank 3 glasses of milk. Who is more likely to have stronger bones?
3. Model, lead, and test stating the rule and relating the answer to the rule

Inference – Relationship Stated

1. Provide a rule
   - e.g. the more milk you drink, the stronger your bones
2. Provide questions for which the rule is required to find the answer
   - Chris drank one glass of milk. Jeff drank 3 glasses of milk. Who is more likely to have stronger bones?
3. Model, lead, and test stating the rule and relating the answer to the rule

Inference – Relationship Not Stated

1. Give a series of questions based on prior knowledge
   - e.g., The snow was falling as Cho walked home from school. How do you think Cho felt: a. hot, b. cold, or c. tired?
2. Model finding clues to help
   - e.g., It’s snowing, what do we know about the temperature when it snows?

Inference – Relationship Induced

1. Model finding information to induce a rule
   - e.g. Nicole likes healthy foods
2. Answer the question
3. Model, lead, & test

Results

SC MS

- 87% of kids below the 10th %ile made MAP reading gains
  - 77% made gains of more than 5 RIT points
  - The average gain was 12.1 RIT points!
- 80% of the students in the 11-25th %ile made MAP reading gains.
  - 53% made gains of 5 RIT points or more
  - Average gain was 8.32 RIT points!
- 6th grade +4.5, 7th grade +5.9, 8th grade +6.5
5-Year Plan
1. Get universal screening data collected and grade level teams using it
   1. Classwide problems
   2. Plan tier 2
2. Start tier 2
   1. Plan for tier 3
   2. Train Problem-solving team
3. Start tier 3 (PST)
4. Assess the system
5. Up and running