

## Assessment FOR Intervention within an RTI Framework

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## Substantial Shift in Education

- 1983!
- Focused to comprehensive
- Basic skill to proficiency
- Process to outcomes

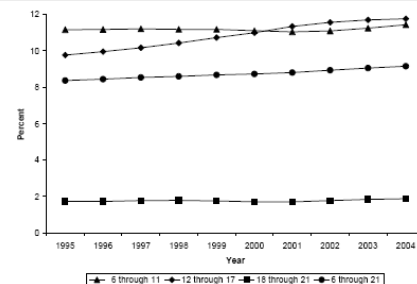
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## Special Education

- 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

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Figure 1-15. Percentage<sup>a</sup> of the population ages 6 through 21 receiving special education and related services under IDEA, Part B, by age group: Fall 1995 through fall 2004



Sources: U.S. Department of Education, Office of Special Education Programs, Data Analysis System (DANS), OMB #1820-0043. "Children with Disabilities Receiving Special Education Under Part B of the Individuals with Disabilities Education Act," 1995-2004. Data updated as of July 30, 2005. Also notes 1-9, 1-10, C-4 and C-5 in vol. 2 of this report. These data are for the 50 states and the District of Columbia (including BIA schools).

## The Results

- Involving special education personnel in prereferral activities reduces placements into special education (Burns, 1999)
- Co-teaching
  - Strong effects for language arts and moderate effects for math (Murawski & Swanson, 2001)
  - Enhances skills of students who are at-risk but non-disabled (Cook & Friend, 2004)

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## RTI and NCLB

- 300.309 – Diagnosing LD
- (i) The child fails to achieve a rate of learning to make sufficient progress to meet **State-approved results** in one or more of the areas identified in paragraph (a)(1) of this section when assessed with a response to scientific, research-based intervention process;

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## Interventions for Children with LD

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

Kavale & Forness, 2000



## Special Education Meta-Analysis

- $d = -.12$
- What is special education???



**Individualized instruction**, at no cost to the parents or guardians, to meet the **unique needs** of a child with a disability.



## Test Score Data

- Less than 33% of 4<sup>th</sup> grade students scored within a proficient range in math (Manzo & Galley, 2003)
- 29% of 4<sup>th</sup> and 8<sup>th</sup> grade students scored within a proficient range in reading (National Center for Educational Statistics 2005).
- Approximately 25% of 4<sup>th</sup> and 12<sup>th</sup> grade-students demonstrated proficient writing skills (U.S. Department of Education, 2002).



## RTI

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

Burns & VanDerHeyden, 2006



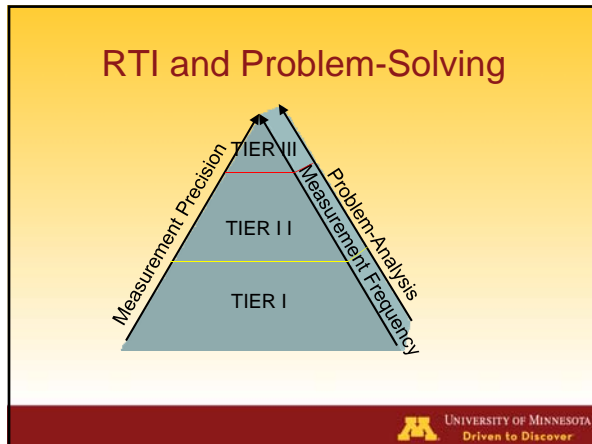
## Multi-Tiered Academic Interventions (Burns, Jimerson, & Deno, 2007)

**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. (**What is the category of the problem?**)
  - Tier III – Identify discrepancy for individual. Identify causal variable. (**What is the causal variable?**)

## FORMATIVE EVALUATION

Assessment FOR Learning

- ### What is summative evaluation?????
- After instruction
  - Effectiveness of instruction
  - Did the student benefit
  - Monitor progress toward objectives

- ### What is formative evaluation?
- “systematic evaluation in the process of curriculum construction, teaching, and learning for the purposes of improving any of these three processes” (Bloom et al., 1971, p. 117).
  - Data collected before instruction occurs
  - Data are used to plan instruction that will better meet student needs (William, 2006).
  - Collecting data before and/or during instruction only becomes a formative evaluation if the data are used to plan or modify instruction.

- ### Purpose
- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• Formative Evaluation</li> <li>• Identify specific objectives mastered and not mastered</li> <li>• Determine what needs to be taught</li> </ul> | <ul style="list-style-type: none"> <li>• Summative Evaluation</li> <li>• Identify degree to which outcomes have been attained</li> <li>• Assign a grade</li> </ul> |
|---|--|


## Timing

- Formative Evaluation
- After completing preliminary instruction in a new skill or concept
- Before further instruction
- Summative Evaluation
- After completing instruction in a number of objectives

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## Generalization

- Formative Evaluation
- Generalizes to specific skill or task
- Summative Evaluation
- Generalizes to broad ability (e.g., reading)

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## Assessment Formats

- General outcome measure (GOM)
  - standardized measures that assess proficiency of global outcomes associated with an entire curriculum
  - assess instructional effectiveness to make changes quickly as needed
- Subskill mastery measure (SMM)
  - assessments of smaller domains of learning based on predetermined criteria for mastery
- (Fuchs & Deno, 1991)

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## Subskill Mastery Measurement

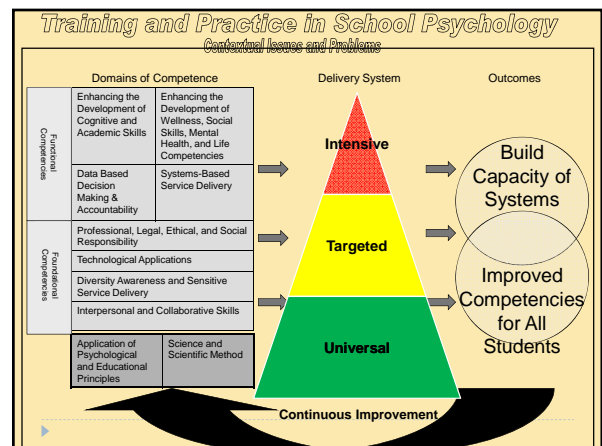
- Burns, M. K., VanDerHeyden, A. M., & Jiban, C. (2006). Assessing the instructional level for mathematics: A comparison of methods. *School Psychology Review*, 35, 401-418.
- Burns, M. K., & Mosack, J. (2005). Criterion-referenced validity of measuring acquisition rates with curriculum-based assessment. *Journal of Psychoeducational Assessment*, 25, 216-224.
- Burns, M. K. (2004). Using curriculum-based assessment in the consultative process: A useful innovation or an educational fad. *Journal of Educational and Psychological Consultation*, 15, 63-78.
- Burns, M. K. (2004). Age as a predictor of acquisition rates as measured by curriculum-based assessment: Evidence of consistency with cognitive research. *Assessment for Effective Intervention*, 29 (2), 31-38.
- Burns, M. K. (2001). Measuring sight-word acquisition and retention rates with curriculum-based Assessment. *Journal of Psychoeducational Assessment*, 19, 148-157.
- Burns, M. K., Tucker, J. A., Frame, J., Foley, S., & Hauser, A. (2000). Interscorer, alternate-form, internal consistency, and test-retest reliability of Gickling's model of Curriculum-based Assessment for reading. *Journal of Psychoeducational Assessment*, 18, 353-360.

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## SMM Effectiveness

- Burns, M. K. (2007). Reading at the instructional level with children identified as learning disabled: Potential implications for response-to-intervention. *School Psychology Quarterly*.
- Treptow, M. A., Burns, M. K., & McComas, J. J. (2007). Reading at the frustration, instructional, and independent levels: Effects on student time on task and comprehension. *School Psychology Review*, 36, 159-166.
- VanDerHeyden, A. M., & Burns, M. K. (2005). Using curriculum-based assessment and curriculum-based measurement to guide elementary mathematics instruction: Effect on individual and group accountability scores. *Assessment for Effective Intervention* 30 (3), 15-29.
- Burns, M. K. (2002). Comprehensive system of assessment to intervention using curriculum-based assessments. *Intervention in School and Clinic*, 38, 8-13.

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## TIER I

Classwide problem?

## Kindergarten

- Phonemic Awareness
  - Initial Sound Fluency; ISF
  - Phonemic Segmentation Fluency; PSF
  - Rhyme
  - Initial sound deletion
- Letter Knowledge
  - Letter Naming Fluency; LNF
- Graphophonemic Knowledge
  - Letter Sound Fluency; LSF
  - Nonsense Word Fluency; NWF (also decoding)

## Other grades

- First grade
  - Word list
  - Spelling
  - Reading fluency
- Second through sixth grade
  - Reading fluency at grade level
- Seventh grade +
  - Maze

## You Have the Data – Now What?

- Data Management Team
  - Usually school psychologist and one other
  - Know data!
- Grade Level Teams
- Get data to teachers within 2 to 3 days
- Lead data meeting

## Reading Instruction in Elementary School

- Two hours each day
- Explicit instruction
- Free-choice reading
- Word study
- Writing
- National Reading Panel

## Classwide Intervention

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



### Risk Levels for FCAT Mazes Test, 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup> grades

6 <sup>th</sup> Grade			7 <sup>th</sup> Grade			8 <sup>th</sup> Grade			
Fall	Win	Spr	Fall	Win	Spr	Fall	Win	Spr	
0-10	0-12	0-13	0-13	0-15	0-16	0-16	0-18	0-19	HR
11-26	13-29	14-32	14-24	16-27	17-30	17-27	19-30	20-33	MR
27+	30+	33+	25+	28+	31+	28+	31+	34+	LR

HR – High Risk: Seriously below grade level and in need of substantial intervention  
 MR – Moderate Risk: Moderately below grade level and in need of intervention  
 LR – Low Risk: At grade level

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### Maze Risk Level Chart - Grades 9 - 12 2006-2007 School Year

	Grade 9			Grade 10			Grade 11			Grade 12			
	Fall Assessment 1	Winter Assessment 2	Spring Assessment 2	Fall Assessment 1	Winter Assessment 2	Spring Assessment 2	Fall Assessment 1	Winter Assessment 2	Spring Assessment 2	Fall Assessment 1	Winter Assessment 2	Spring Assessment 2	
Risk	0-16	0-18	0-19	0-16	0-18	0-19	0-16	0-18	0-19	0-16	0-18	0-19	HR
	17-27	19-30	20-33	17-27	19-30	20-33	17-27	19-30	20-33	17-27	19-30	20-33	MR
	28+	31+	34+	28+	31+	34+	28+	31+	34+	28+	31+	34+	LR

HR - High Risk: Seriously below grade level and in need of substantial intervention  
 MR - Medium Risk: Moderately below grade level and in need of substantial intervention  
 LR - Low Risk: At grade level

<http://www.fcrr.org/assessmentMiddleHighSchool.htm>

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### Literacy in MS/HS

IMPROVING LITERACY INSTRUCTION IN MIDDLE AND HIGH SCHOOLS  
A Guide for Principals

<http://www.fcrr.org/Interventions/pdf/Principals%20Guide-Secondary.pdf>

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## TIER II

Category of the Deficit

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### 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

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### 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.).

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### Means and Ranges of Effect Sizes by Reading Outcome Measure

	N	Mean ES	SD	Minimum	Maximum
Pseudowords	24	.84	.80	-.19	3.60
Words in Isolation	48	.92	.89	-.05	4.33
Contextual Reading	24	.37	.38	-.37	1.18

### Assess 4 NRP Areas

- Phonemic Awareness
  - Phoneme segmentation fluency
- Phonics
  - Nonsense word fluency (WJ Pseudoword)
- Fluency
  - Oral reading fluency (TOSCRF)
- Vocabulary/Comprehension

### Category of Problem MN HS

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

### Florida Center for Reading Research

[www.fcrr.org](http://www.fcrr.org)

- Click – For Teachers
- Click – Interventions for Struggling Readers
- Click – Supplemental and Intervention Programs

<http://www.fcrr.org/FCRRReports/CRReportsCS.aspx?rep=supp>

### Tier III

Intensive Problem Analysis

### Meta-analytic Research for Reading Interventions

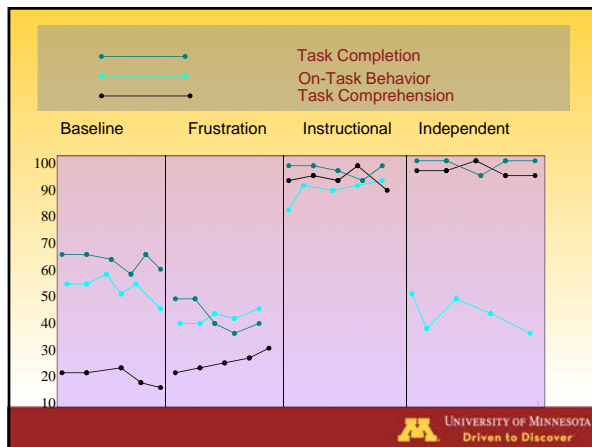
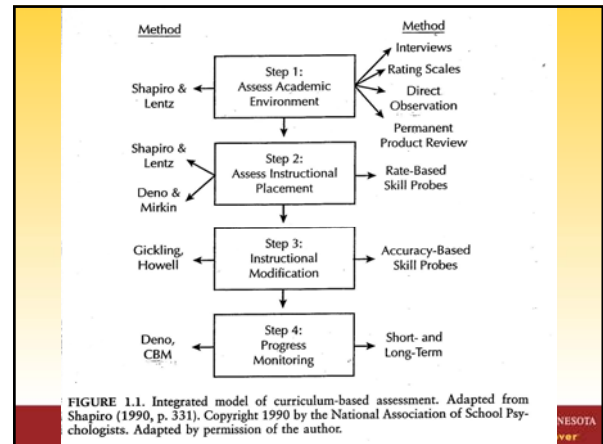
- ❖ Auditory Reception .21
- ❖ Auditory Association .44
- ❖ Visual Reception .21
- ❖ Visual Association .39
- ❖ Auditory Sequential Memory .32
- ❖ Visual Sequential Memory .27

❖ Kavale (2001)

### Meta-analytic Research for Reading Interventions

- Formative evaluation .71
  - Fuchs & Fuchs (1986)
- Direct instruction .84
- Explicit reading comprehension instruction 1.13
  - Kavale & Forness (2000)

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### MOTIVATION (Gickling & Thompson, 1985)

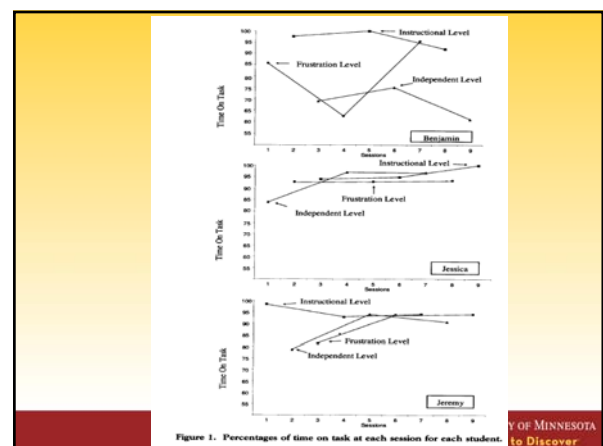
- Independent Level
  - 98% - 100% known material
- Instructional Level
  - 93% - 97% known material
- Frustrational Level
  - Less than 93% known

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### Instructional Level

- Betts (1946)
- “A comfort zone created when the student has sufficient prior knowledge and skill to successfully interact with the task and still learn new information” (Gravois & Gickling, 2002, p. 888).
  - Optimal level of challenge
- Vygotsky’s (1978) Zone of Proximal Development (ZPD)

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## INSTRUCTIONAL LEVEL

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## Instructional Match

- How closely a student skill level matches the difficulty of the instructional material (Daly, Martens, Kilmer, & Massie, 1996)
- Improves student learning (Burns, 2002; Burns, 2005; Daly, Witt, Martens, & Dool, 1997; Shapiro, 1992).
- Match between student skill and instructional material is an important functional variable for student learning within response-to-intervention (Gresham, 2001).

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## Curriculum-Based Assessment

- Term was first coined by Gickling in 1977 (Coulter, 1988).
  - CBA was designed to systematically assess the “instructional needs of a student based upon the on-going performance within the existing course content in order to deliver instruction as effectively as possible” (Gickling, Shane, & Croskery, 1989, pp. 344-345).
- Assesses match between student skill and curriculum for instructional planning (Burns, MacQuarrie, & Campbell, 1999).

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## Curriculum-based approaches

<h3 style="margin: 0;">CBA - ID</h3> <ul style="list-style-type: none"> <li>• Measures accuracy</li> <li>• Instructional, planning, managing, and delivery</li> <li>• Assesses instructional level</li> </ul>	<h3 style="margin: 0;">CBM</h3> <ul style="list-style-type: none"> <li>• Measures fluency</li> <li>• Instructional effectiveness</li> </ul>
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## Reliability

	IR	AF	RT r	RT t
Second Grade	.99	.84	.90	.88
Third Grade	.90	.88	.93	.81
Fourth Grade	.99	.81	.96	.83
Total	.99	.86	.92	.85

Burns, Tucker, Frame, Foley, & Hauser, 2000

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## Advantages over IRI

- Psychometric data
- Research based
- No assumptions for generalizability
- IRIs passages are inconsistent

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### Math Criteria

- Gickling and Thompson
  - 70% to 85% known
  
- Deno & Mirkin (1977)
  - 10-19 digits correct per minute (dc/min) for 1<sup>st</sup> – 3<sup>rd</sup> grades
  - 20-39 dc/min for 4<sup>th</sup> through 12<sup>th</sup>
  - Criteria established at one precision teaching school in Minnesota (S. L. Deno, personal communication, April 15, 2005), not research.



Means, Standard Deviations, and Correlation Coefficients for Fluency and Accuracy Scores

	Fluency					Accuracy				
	Probe 1		Probe 2		<i>r</i>	Probe 1		Probe 2		<i>r</i>
Group	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
2 <sup>nd</sup> and 3 <sup>rd</sup>	19.8	7.5	20.5	8.7	<b>.64*</b>	94.7	5.9	94.7	6.4	<b>.36*</b>
4 <sup>th</sup> and 5 <sup>th</sup>	33.5	12.0	32.9	13.6	<b>.85*</b>	96.5	4.1	97.0	4.0	<b>.50*</b>
Total Sample	26.0	11.9	26.2	12.8	<b>.84*</b>	95.5	5.2	95.8	5.6	<b>.42*</b>



### Derived Criteria

- Used data from 4 weeks of single-skill probes
- A regression line was then fitted to each graph using Ordinary Least Squares regression
- 66<sup>th</sup> percentile of slope was cutoff for rate of learning
- Mean fluency at baseline used as instructional level



### Empirically Derived Fluency Criteria

- Mean starting dc/m for high responders
- 2<sup>nd</sup> and 3<sup>rd</sup> grade
  - 14 to 31 Digits Correct/Min
- 4<sup>th</sup> and 5<sup>th</sup> grade
  - 24 to 49 Digits Correct/Min



### Drill Tasks

- Independent Level
    - 86% - 100% known material
  - Instructional Level
    - 70% - 85% known material
  - Frustration Level
    - Less than 70% known
- Gickling & Thompson, 1985



### Drill and Practice

- The most effective device that can be applied to learning is to increase the amount of drill or practice" (Chase & Symonds, 1992; p. 289)
- The primary benefit of efforts to increase motivation was an increase in practice.
- Teaching basic skills through drill tasks led to increased performance of more advanced skills (Dehaene & Akhaverin, 1995; Jones & Christensen, 1999; Tzelgove, Porat, & Henik, 1997)



### Academic Deficits in Children Labeled LD

- Poor reading fluency among children with phonemic awareness (Chard, Vaughn, Tyler, 2002)
- Poor fluency in retrieval of math facts (Miller & Mercer, 1997)
- Difficulty retrieving spelling words from memory (Lerner, 2003)

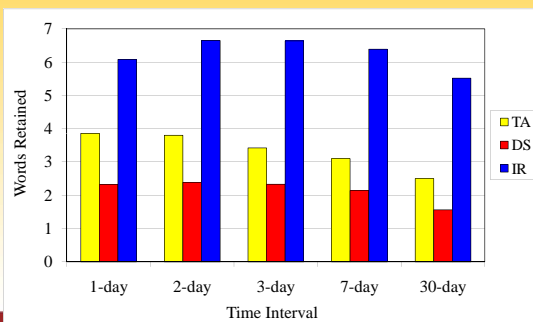


### Incremental Rehearsal

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



### Mean Number of Word Retained



### Correlation between retention and receptive vocabulary

	1 day	2 days	3 days	7 days	30 days
TA	.32	.27	.32	.23	.08
DS	.22	.25	.17	.16	.20
IR	-.16	-.13	.06	.04	-.07

These results are "astounding" (Daly & McCurdy, 2002; p. 457).



### Drill Tasks

- Independent Level
  - 86% - 100% known material
- Instructional Level
  - 70% - 85% known material
- Frustration Level
  - Less than 70% known

Gickling & Thompson, 1985



### Incremental Rehearsal Effectiveness

Bunn, R., Burns, M. K., Hoffman, H. H., & Newman, C. L. (2005). Using incremental rehearsal to teach letter identification with a preschool-aged child. *Journal of Evidence Based Practice for Schools, 6*, 124-134.

Burns, M. K. (2007). Reading at the instructional level with children identified as learning disabled: Potential implications for response-to-intervention. *School Psychology Quarterly, 22*, 297-313.

Burns, M. K. (2005). Using incremental rehearsal to practice multiplication facts with children identified as learning disabled in mathematics computation. *Education and Treatment of Children, 28*, 237-249.

Burns, M. K., & Boice, C. H. (2009). Comparison of the relationship between words retained and intelligence for three instructional strategies among students with low IQ. *School Psychology Review, 38*, 284-292.

Burns, M. K., Dean, V. J., & Foley, S. (2004). Preteaching unknown key words with incremental rehearsal to improve reading fluency and comprehension with children identified as reading disabled. *Journal of School Psychology, 42*, 303-314.

Matchett, D. L., & Burns, M. K. (2009). Increasing word recognition fluency with an English language learner. *Journal of Evidence Based Practices in Schools, 10*, 194-209.

Nist, L. & Joseph L. M. (2008). Effectiveness and efficiency of flashcard drill instructional methods on urban first-graders' word recognition, acquisition, maintenance, and generalization. *School Psychology Review, 37*, 294-208.



Means, Standard Deviations, and Dependent t-test Results for CBM Reading and Change Scores

	Treatment Group		Control Group		t = .07
	M	SD	M	SD	
Median Baseline	41.57	23.44	41.72	26.64	
Final (15th) Score	65.17	29.71	47.45	25.33	t = 5.65*
Slope of Growth	1.81	.94	.42	.94	F = 15.75*

Note – CBM scores are words read correctly/minute

\* p < .001

Cohen's d = 1.47 SD units

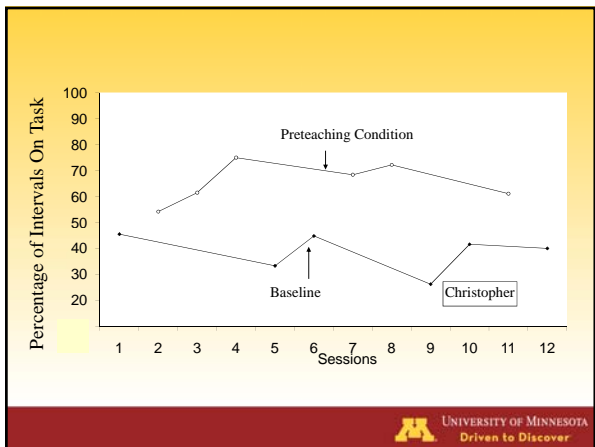
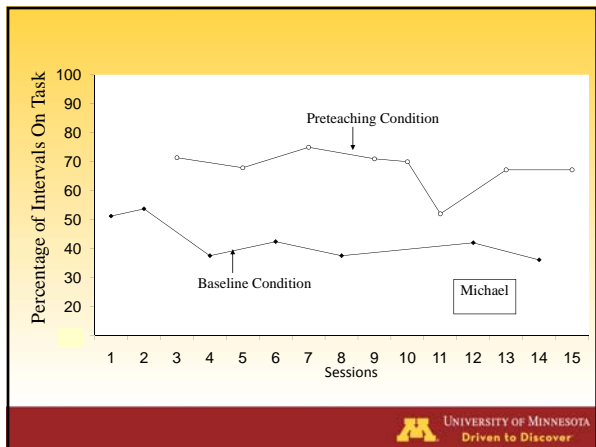
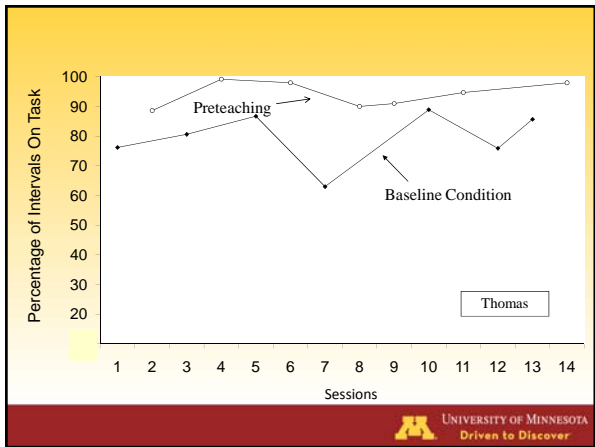
### More Passages at the Instructional Level

Interval	Treatment						Control						Z
	Frustr.		Instr.		Indep.		Frustr.		Instr.		Indep.		
	N	%	N	%	N	%	N	%	N	%	N	%	
Baseline	24	83	05	17	00	00	24	83	05	17	00	00	0.00
1	09	31	20	69	00	00	19	66	09	41	01	03	1.25
2	08	28	20	69	01	3	20	69	08	28	01	03	3.60*
3	10	35	14	48	05	17	19	66	07	24	03	10	2.19*
4	04	14	19	66	06	21	19	66	10	35	00	00	3.67*
5	03	10	19	66	07	24	19	66	09	31	01	03	4.12*

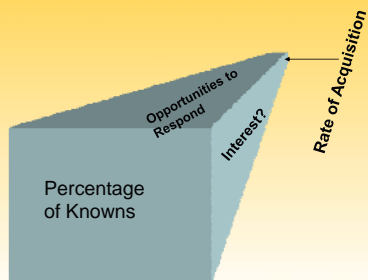
Mann-Whitney Test

\*p < .05

- Category count score was correlated with the progress slope for all 58 students
- r = .80, p < .001
- Assessed relationship between reading material presented at the instructional level and reading growth.



### Instructional Level for Drill Tasks



### Application of Interference

- Rate of Acquisition
  - The amount of new information a student can learn before interference occurs.
- Rate of Retention
  - The amount of previously learned data that can be recalled at a later time.

Modifying instruction based on acquisition and retention rates increases academic achievement (Roberts et al., 1991; Shapiro, 1992)

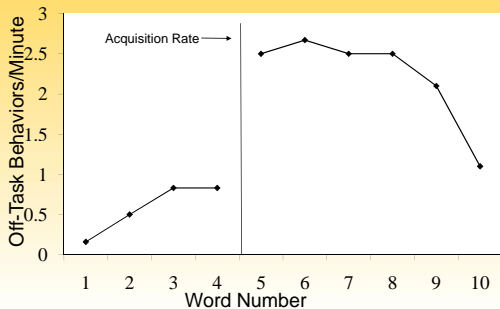
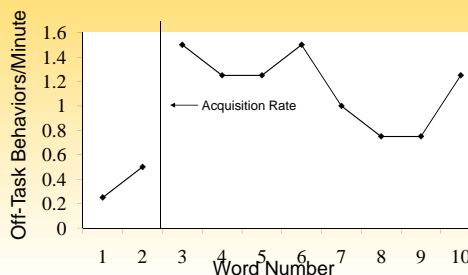
### Criterion-Related Validity

Table 1  
Means, Standard Deviations, and Correlation Coefficients for AR and TOMAL Data

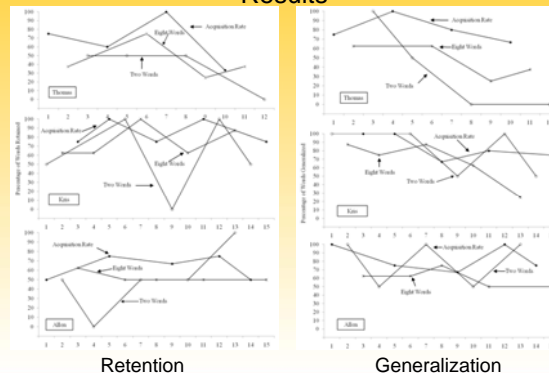
	M	D	Obtained <i>r</i> with AR	Corrected <i>r</i> with AR
Acquisition Rate	6.0	2.7	NA	NA
Verbal Memory Index	99.3	14.1	.57*	.58*
Nonverbal Memory Index	100.8	14.7	.71*	.72*
Composite Memory Index	100.3	14.1	.68*	.70*

\*  $p < .01$ .

(Burns & Mosack, 2005)



### Results



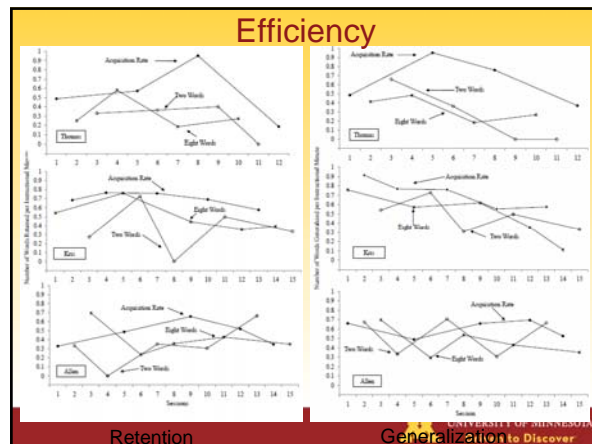
## Results

Means and Standard Deviations for Each Condition by Student

Student	Percentage of Words Retained			Percentage of Words Generalized			Number of Words Retained per Instructional Minute			Number of Words Generalized per Instructional Minute		
	AB	Eight	Two	AB	Eight	Two	AB	Eight	Two	AB	Eight	Two
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Thomas	67.00% (27.91%)	43.75% (21.65%)	37.50% (25.00%)	80.43% (14.16%)	46.88% (18.75%)	37.50% (18.75%)	55 (32)	32 (18)	27 (18)	64 (26)	34 (14)	26 (32)
Kris	85.00% (25.28%)	75.00% (24.49%)	60.00% (32.64%)	84.40% (14.98%)	67.50% (25.92%)	80.00% (27.39%)	70 (08)	50 (16)	37 (27)	71 (15)	48 (25)	48 (17)
Allen	83.40% (12.66%)	52.50% (5.59%)	50.00% (35.36%)	83.40% (15.50%)	60.00% (10.46%)	80.00% (27.39%)	47 (13)	41 (17)	33 (24)	61 (09)	46 (16)	54 (20)

Note. 2 = two words were taught, 8 = eight words were taught, AB = set size determined by acquisition rate

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## Instructional Hierarchy: Stages of Learning

	Acquisition	Proficiency	Generalization	Adaption
<b>Learning Hierarchy</b>	■ Slow and inaccurate	■ Accurate but slow	■ Can apply to novel setting	■ Can use information to solve problems
<b>Instructional Hierarchy</b>	■ Modeling ■ Explicit instruction ■ Immediate corrective feedback	■ Novel practice opportunities ■ Independent practice ■ Timings ■ Immediate feedback	■ Discrimination training ■ Differentiation training	■ Problem solving ■ Simulations

Haring, N. G., & Eaton, M. D. (1978). Systematic instructional procedures: An instructional hierarchy. In N. G. Haring, T. C. Lovitt, M. D. Eaton, & C. L. Hansen (Eds.) *The fourth R: Research in the classroom* (pp. 23-40). Columbus, OH: Charles E. Merrill.

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- ## Accuracy
- Contextual Reading
    - 93% - 97% known material
  - Everything Else
    - 90% known
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- ## Rate
- Once a student is accurate, the main concern is proficiency which is measured by rate
    - Rate is commonly measured by schools e.g., CBM
  - Rate cut points are often based on normative expectations for the skill of concern
    - Rate is also an indicator of when a student moves from the proficiency to the generalization stage
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## 2005 Hasbrouck & Tindal Oral Reading Fluency Data

Jan Hasbrouck and Gerald Tindal conducted an extensive study of oral reading fluency in 2004. The results of their study are presented in a technical report entitled, "Oral Reading Fluency: 90 Years of Measurement," which is available on the University of Oregon's website, <http://www.uoregon.edu/~ledet/reports/90>.

This table shows the oral reading fluency rates of students in grades 1 through 8 as determined by Hasbrouck and Tindal's data. You can use the information in this table to draw conclusions and make decisions about the oral reading fluency of your students. Students scoring below the 50th percentile using the average score of two spaced-out readings from grade-level materials need a fluency-building program. In addition, teachers can use the table to set the 10-minute fluency goals for their struggling readers.

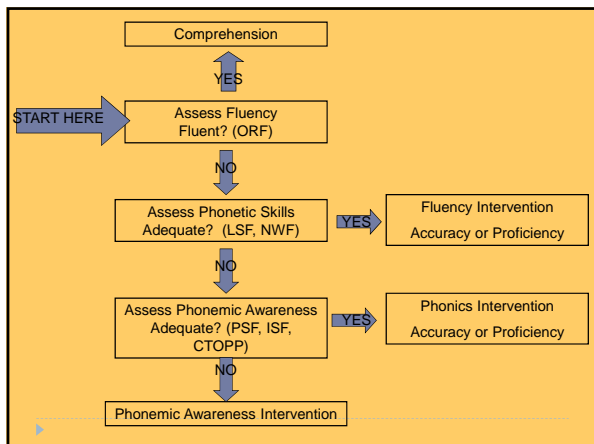
Average weekly improvement is the average words per week growth you can expect from a student. It was calculated by subtracting the fall score from the spring score and dividing the difference by 10, the typical number of weeks between the fall and spring assessments. For grade 1, since there is no fall assessment, the average weekly improvement was calculated by subtracting the winter score from the spring score and dividing the difference by 10, the typical number of weeks between the winter and spring assessments.

Grade	Percentile	Fall WCPM*	Winter WCPM*	Spring WCPM*	Avg. Weekly Improvement**
1	90	51	111	159	1.9
	75	47	82	122	2.2
	50	23	53	109	1.9
	25	12	26	110	1.0
	10	6	15	68	0.6
2	90	106	125	142	1.1
	75	79	150	117	1.2
	50	61	72	90	1.2
	25	25	42	61	1.1
	10	11	15	31	0.6

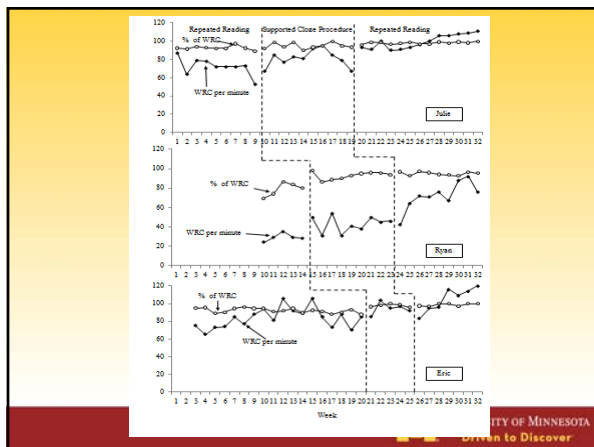
Grade	Percentile	Fall WCPM*	Winter WCPM*	Spring WCPM*	Avg. Weekly Improvement**
3	90	128	148	182	1.1
	75	99	120	137	1.2
	50	71	92	107	1.1
	25	44	62	79	1.1
4	90	145	166	190	1.1
	75	119	139	152	1.0
	50	94	112	123	0.9
	25	68	87	98	0.9
5	90	156	163	184	0.9
	75	136	164	168	0.9
	50	110	127	139	0.9
	25	85	99	109	0.8
6	90	177	195	204	0.8
	75	153	167	177	0.8
	50	127	140	150	0.7
	25	98	111	122	0.8
7	90	180	192	202	0.7
	75	156	166	177	0.7
	50	128	136	150	0.7
	25	102	109	123	0.7
8	90	185	199	199	0.4
	75	181	173	177	0.6
	50	153	146	151	0.6
	25	106	115	124	0.6

\*WCPM = Words Correct Per Minute  
\*\*Average words per week growth

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Learning Hierarchy	Phonemic Awareness	Phonics	Fluency
Acquisition	Explicit instruction in blending and segmenting (Blackman et al., 2001)	Incremental Rehearsal with letter sounds (Tucker, 1989)  Explicit instruction in letter sounds (Camine et al., 2004)	Incremental Rehearsal for words (Burns, 2007)  Listening passage preview (Rose & Sherry, 1984)  Supported Cloze Reading (Rasinski, 2003)  Phrase drill (O'Shea, Munson, & O'Shea, 1984)
Proficiency	Language & Listening (Adams et al., 1998)	Word boxes & word sorts (Joseph, 2000)	Repeated reading (Moyer, 1982) Read Naturally
Generalization	Discrimination and differentiation training		
Adaption	Problem-solving activities and simulations		

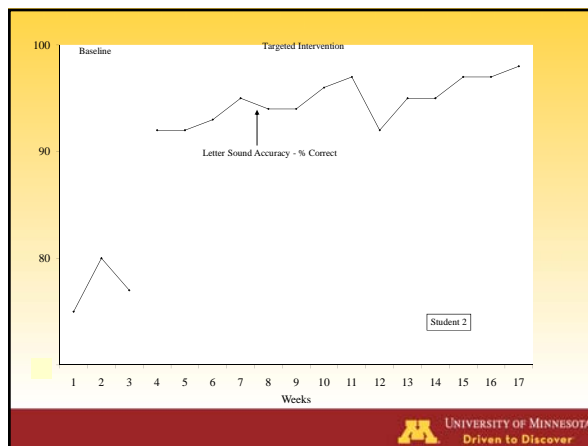


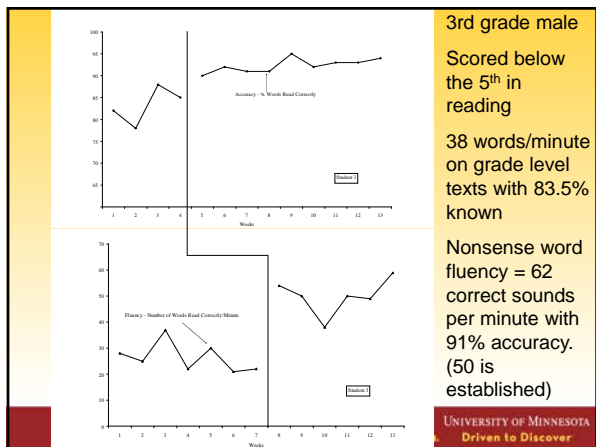
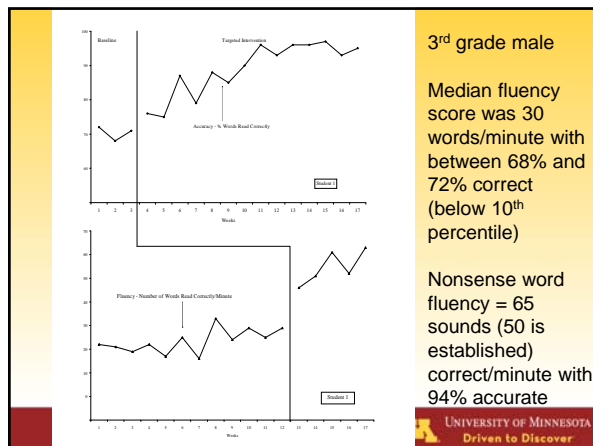
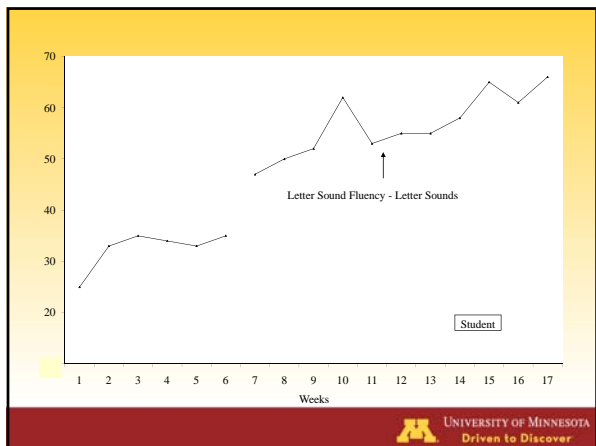
### Peter

- Second Grade
- NWEA test this fall, he scored at the 4th percentile for reading
- Reading fluency score was 13 WRC/M – Well below average range.
- Participates in Read Naturally, (where he is placed at grade level 1.0)

### Peter

- ORF: 13 wcm with 60% accuracy
- Phonics:
  - NWF: 24 sounds/minute with 67% known
  - 2<sup>nd</sup> grade rate cut score is 30 words/min
- Phonemic Awareness
  - PSF: 38 with 93% accuracy
  - Cut score is 35 sounds/min





<http://www.usm.maine.edu/cehd/future/>

### Dual Discrepancy


- Children who were below their peers in both post-intervention level and slope of progress would be classified as non-responders and LD (Fuchs, Fuchs et al., 2003; Fuchs, Mock et al., 2003).
- Empirical support for the validity of the DD model in diagnosing LD has been found (Burns & Senesac, 2005; McMaster, Fuchs, Fuchs, & Compton, 2005; Speece & Case, 2001; Speece, Case, & Molloy, 2003)
- Empirical comparisons of post-intervention assessment only, growth rates only, and DD models favored DD (Fuchs, 2003; Fuchs, Fuchs et al., 2003).

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Student	Teacher	Fall	1	2	Slope	Winter	Spring	Slope 2
A	2 <sup>nd</sup> grade	79				95	90	.31
B		12	25	30	1.43	41	62	1.39
C		5	6	7	.16	8	16	.31
D		97				153	138	1.14
E		47				113	115	1.89
F		96				102	128	.89
G		23	28	29	.77	39	57	.94
H		79				108	136	1.58
I		70				100	109	1.08
J		68				104	120	1.44
K		40				86	95	1.53
L		71				115	134	1.75
M		88				88	153	1.81
N		68				77	85	.47
O		49				71	88	1.08
P		37				70	75	1.06
Q		14	19	21	.55	25	55	1.14
R		91				123	135	1.22
S		6	14	23	1.53	35	65	1.64
▶	Median	68	<.72			97.5	112	1.19 SD = .47


### DD or Aimline

- 30 2<sup>nd</sup> grade students getting Tier 2
- Agreement between the two
  - 18 out of 30 agreed
- Internal consistency
  - *Aimline* - agreed 21 (out of 30) times,  $\kappa = .29$  ( $p = .07$ ).  $\tau = .44$  ( $p = .014$ ).
  - DD - 24 agreements,  $k = .58$  ( $p < .01$ ).  $T = .58$  ( $p < .01$ ).




### DD or Aimline

- Standard Error of Measure
  - *Aimline* – 13 agreements (based on initial point),  $k = .13$  ( $p = .36$ )  $T = -.18$  ( $p = .34$ )
  - DD - 29 agreements (based on final point),  $k = .93$  ( $p < .01$ ).  $T = .93$  ( $p < .01$ ).
- Did using median help aimline?
  - agreed 27 times,  $k = .67$  ( $p < .01$ ).  $T = .63$  ( $p < .01$ ).



### DD


- 146 students in first through third grades attending nine schools in Michigan.
  - all scored at or below the 25th percentile on a district-administered group test of reading.
  - None were in special education
- Level and slope measured with DIBELS Oral Reading Fluency
- Gray Oral Reading Test: Fourth Edition (GORT-4; Wiederholt & Bryant, 2001)



Mean GORT-4 reading quotients of students at four levels of growth who met and did not meet dual discrepancy criteria


	Dual Discrepancy			Non-Dual Discrepant			<i>t</i>	<i>d</i>
	N	M	SD	N	M	SD		
25 <sup>th</sup> percentile	34	71.6	12.9	112	83.3	13.7	4.45*	.86
33 <sup>rd</sup> percentile	41	72.3	13.3	105	83.9	13.4	4.69*	.87
50 <sup>th</sup> percentile	61	74.5	13.2	85	85.0	13.5	4.68*	.79
One SD	18	73.0	13.0	128	81.7	14.3	2.44	.64

*Note.* SD = One standard deviation below the mean  
\*  $p < .004$ .



Chi squared statistic for number of students identified as dual discrepant for demographic data and four responsiveness criteria

	df	25 <sup>th</sup> %ile		33 <sup>rd</sup> %ile		50 <sup>th</sup> %ile		One SD	
		$\chi^2$	<i>p</i>	$\chi^2$	<i>p</i>	$\chi^2$	<i>p</i>	$\chi^2$	<i>p</i>
Grade	02	2.28	.32	2.89	.24	<b>9.13</b>	<b>.01</b>	.87	.65
Ethnicity	02	2.67	.26	1.01	.60	1.90	.39	1.27	.53
Gender	01	.23	.63	1.05	.31	.10	.76	.32	.57



### What do we need to do?

- Frequent monitoring
- Data-based decision making
- On-going support in general education
- Multidisciplinary



