



Maximizing Literacy Outcomes for Students with Intellectual Disabilities: Research Study Findings from a Longitudinal Intervention Study

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December 7, 2010

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Overview of Today's Presentation

- Findings from Project Maximize: Federally-funded longitudinal study examining reading instruction for students with low IQs
- Next steps for research and program development
- Recommendations for students (moving beyond our overall findings)
- Lots of Q&A!

My question to you...

- What do you hope to gain from today's presentation?

Terms

- IQ is just a number
- Intellectual disabilities
- Mental retardation, cognitive disabilities
- “borderline” (IQ=70-79)
- “mild” (IQ=55-69)
- “moderate” (IQ=40-54)
- “verbal”
- As much as educators attempt to describe this group, the most apt descriptor is “variable”

Overview of Project Maximize

- One of three federally-funded centers
 - University of North Carolina at Charlotte
 - Diane Browder and her team
 - Georgia State University
 - Rose Sevcik and her team
 - Southern Methodist University
- Purpose of the centers was to examine methods for teaching reading to children with mental retardation or low IQs

Our Team

Principal Investigator

Jill Allor, Ed.D.

Co-Prin. Investigators

Patricia Mathes, Ph.D.

Kyle Roberts, Ph.D.

Project Coordinators

Tammi Champlin, M.Ed.

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Janet Montana

Deirdre North

Twyla Shields

Barbara Stanfield

Chuck Toney

Joanne Werner

And more thanks!

- Notre Dame School of Dallas
- Fort Worth Independent School District
- Across the 4 years of implementation, we were in 14 elementary schools and 9 middle schools

The most thanks!

<i>141 students participated at least one year</i>	Treatment	Contrast
Borderline IQ* (70-79) *WASI or school testing	$n = 35$	$n = 35$
Mild IQ (55-69)	$n = 21$	$n = 16$
Moderate IQ (40-54)	$n = 20$	$n = 14$
TOTAL	$n = 76$	$n = 65$

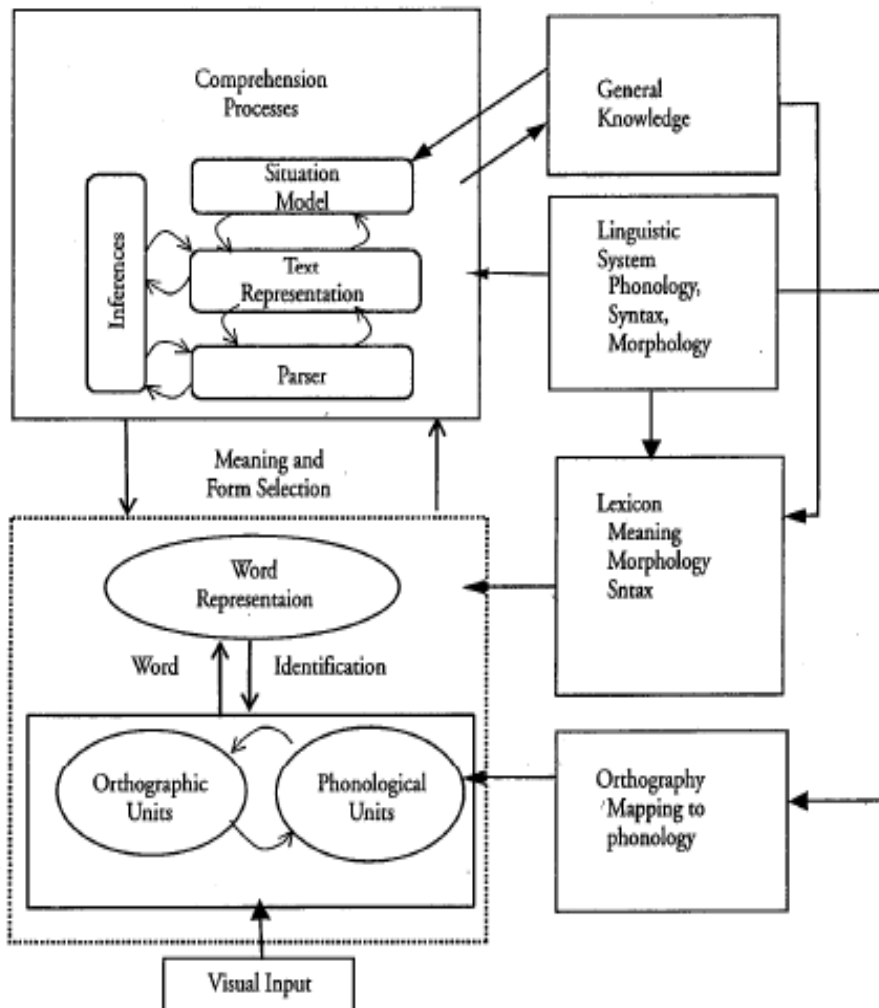
Background: Research on Teaching Reading to Students with Intellectual Disabilities

- Minimal amount of research
- Focused on mild ID, not moderate ID
- Focused on isolated subskills
 - Even students with “moderate” to “severe” levels of ID can learn to automatically recognize a fairly large number of words (sight words)
 - Phonics research was promising

Browder, Wakeman, Spooner, Ahlgrim-DeLzell, & Algozzine, 2006

Conners, Rosenquist, Sligh, Atwell, & Kiser, 2006

Background: Research and Theory about the Reading Process



- Complex!
 - General Knowledge
 - Oral Language
 - Comprehension Processes
 - Word Identification
- Perfetti, Landi, & Oakhill, 2005

Background: Research on Struggling Readers

- Strong research, especially in word recognition, about effective techniques for preventing reading failure

Mathes, P. G., Denton, C. A., Fletcher, J. M., Anthony, J. L., Francis, D. J., & Schatschneider, C. (2005). *Reading Research Quarterly*

Background: Research on Teaching Reading to Students with Intellectual Disabilities

- To our knowledge, no longitudinal randomized control trial research has been conducted to determine whether students with ID can learn to read by **fully processing the print and meaning** of connected text, as is consistent with current theories of reading development

Our Research Questions

1. Is a **comprehensive, structured reading intervention** that has been proven to be effective with struggling readers (i.e. students at risk for learning disabilities, or dyslexia) also **effective for students with IQs between 40 and 79** (including students with ID)?
2. What is the **influence of IQ** on rate of student response to a comprehensive, structured reading curriculum?

Participants by IQ Range

<i>141 students participated at least one year</i>	Treatment	Contrast
Borderline IQ* (70-79) *WASI or school testing	$n = 35$	$n = 35$
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TOTAL	$n = 76$	$n = 65$

Participants by Years of Participation

<i>141 students participated at least one year</i>	Treatment	Contrast
1 Year	$n = 8$	$n = 7$
2 Years	$n = 12$	$n = 11$
3 Years	$n = 23$	$n = 21$
4 Years	$n = 33$	$n = 26$
TOTAL	$n = 76$	$n = 65$

Intervention

Intensity

- Daily Sessions
- Approximately 45 min.
- Groups of 1-4 students
- Implemented by research teachers

Components

- *Early Interventions in Reading*
 - Published by SRA/McGraw-Hill
 - Levels K, 1, and 2
- Supplemental Language Instruction
- Supplemental home-school materials to increase intensity

Intervention: Direct Instruction Model

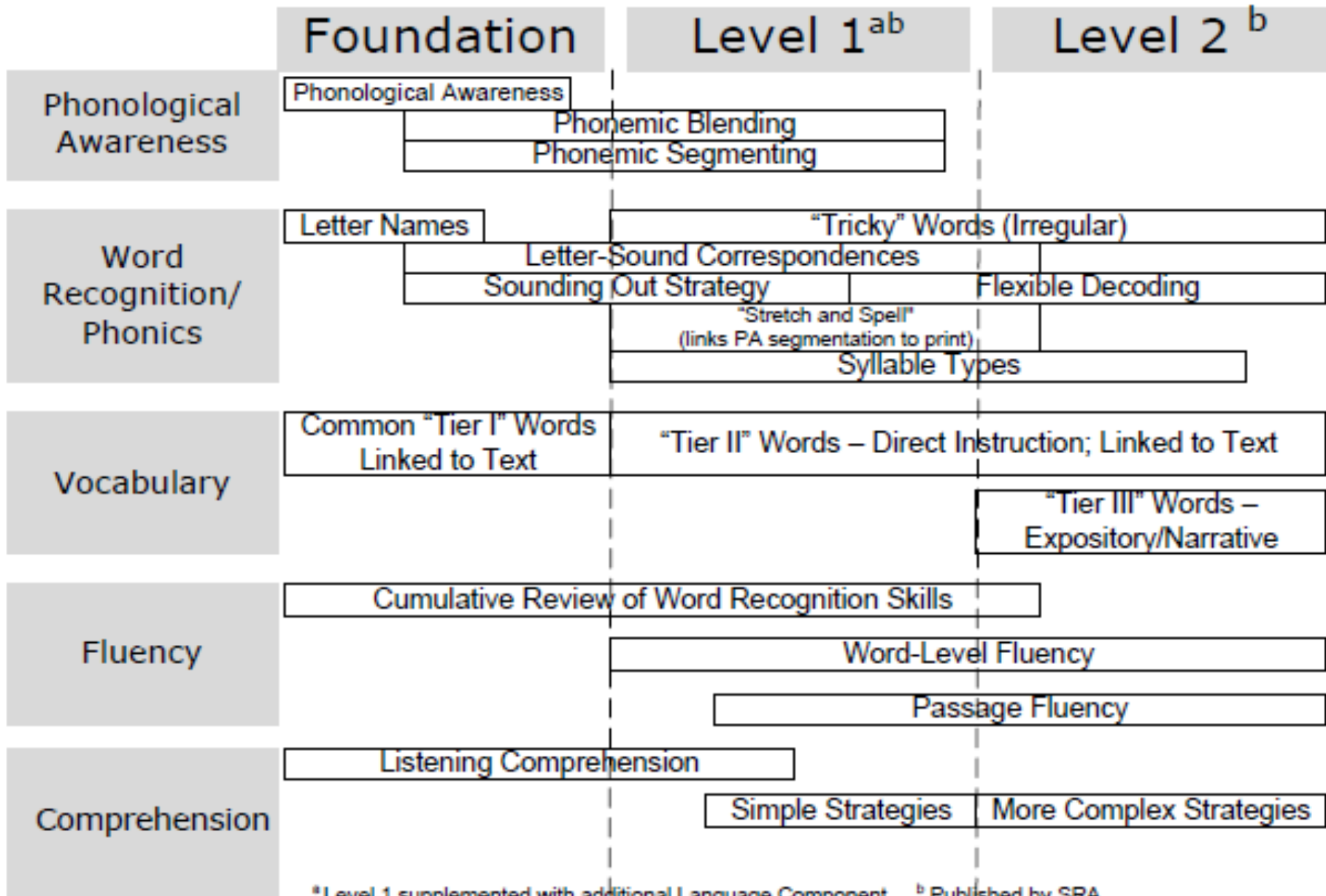
Resources

- Carnine, Silbert, Kame'enui, & Tarver, 2004
- O'Connor, 2007

Features

- Explicit and systematic
- Cumulative review
- Careful sequencing
- Fast-paced
- Immediate Feedback
- Teaching to Mastery
- Increased Opportunities to Respond

Overview of Instructional Strands Content



^aLevel 1 supplemented with additional Language Component ^bPublished by SRA

Contrast Group

- “business as usual”
- Students in Borderline (IQ 70-80) Range
 - General education
 - Open Court in first 2 years; Scott Foresman in last 2 years
- Mild/Moderate (IQ 40-69)
 - Approximately half of the students in the contrast group received instruction using a structured curriculum (Open Court, Scott Foresman, Corrective Reading)
 - Other students participated in a variety of literacy experiences (writing names, letters, listening, etc.)
 - Many participated in Edmark

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Data Analysis

- Annual and Progress Monitoring Measures
 - Hierarchical Linear Modeling
 - Level-1: measurement occasions
 - Level-2: students
 - Factors: IQ and Assignment (Treatment/Control)
- Posttest Only
 - Separate univariate analyses of covariance
 - covariate IQ
 - WIAT Reading Comprehension
 - WIAT Listening Comprehension

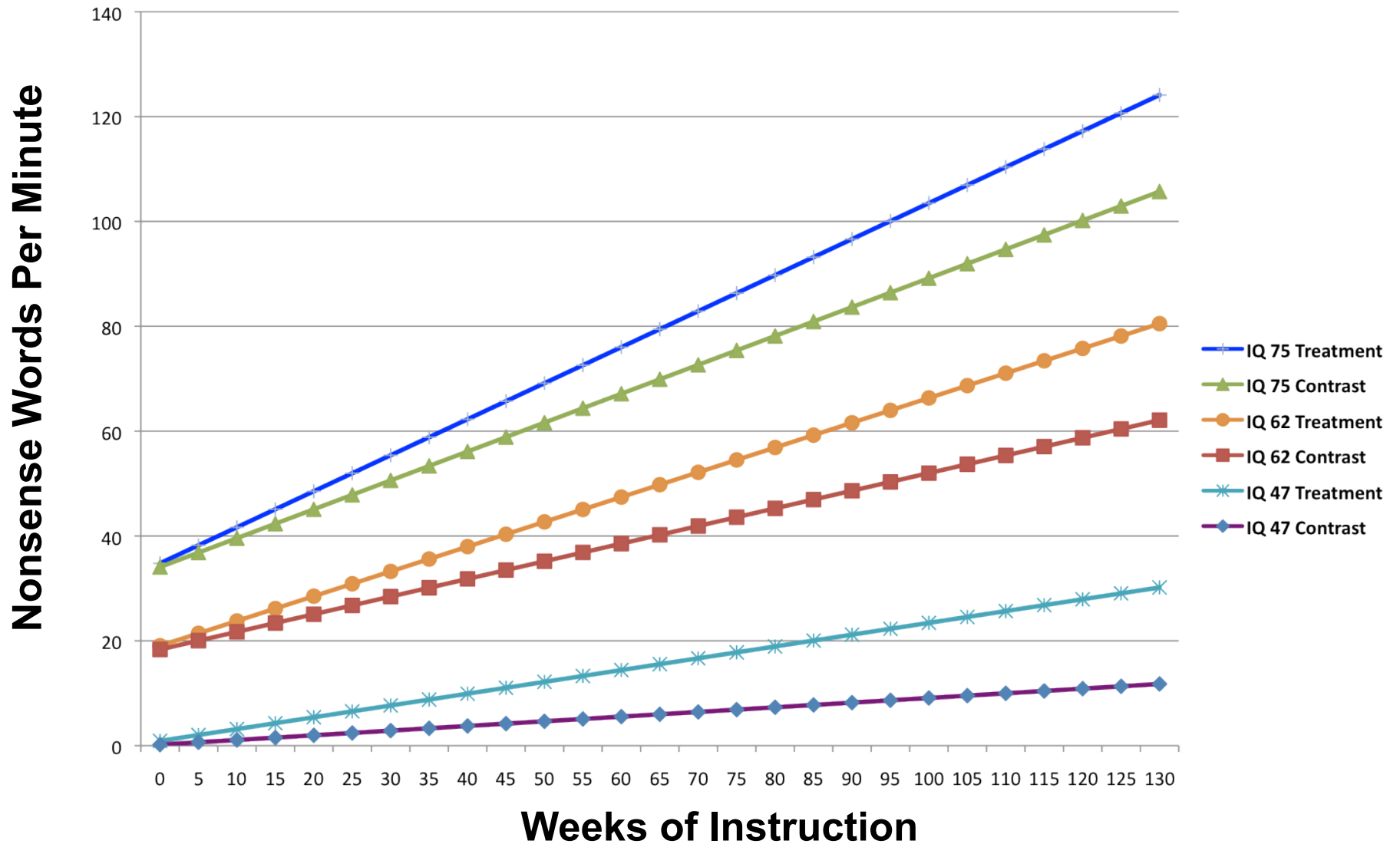
Data Analysis

- Model of best fit
- 3 models
 - Null model
 - Factor: Assignment
 - Factor: IQ and assignment
- 3rd model (IQ and assignment) best fit
- Graphs of predicted scores (not actual scores)

Data Analysis Summary: HLM (Annual/PM)

Reading Skill	Measure (N = 141)	Statistical Significance
Phonemic Awareness	CTOPP Blending Words	Yes
	CTOPP Blending Nonwords	Yes
	CTOPP Segmenting Words	Yes
	DIBELS Phoneme Segmentation Fluency	Yes
Language	Expressive Vocabulary Test	Yes
	Peabody Picture Vocabulary Test	Yes
	WIAT Listening Comprehension (n=95)	
Phonemic Decoding	DIBELS Nonsense Word Fluency	Yes
	TOWRE Phonemic Decoding Efficiency	Yes
	Woodcock Word Attack	Yes
Word Identification	DIBELS Oral Reading Fluency	Yes
	TOWRE Sight Word Efficiency	Yes
	Woodcock Letter-Word Identification	No
Comprehension	WIAT Reading Comprehension (n=95)	

Nonsense Word Fluency: Predicted Scores by IQ and Condition



ANCOVA: Post Only

IQ	<i>Reading Comprehension (p < .05)</i>		<i>Listening Comprehension (ns)</i>	
	Treatment (n = 54) <i>Adjusted Mean</i>	Contrast (n = 41) <i>Adjusted Mean</i>	Treatment (n = 54) <i>Adjusted Mean</i>	Contrast (n = 41) <i>Adjusted Mean</i>
75	96.98	85.80	20.35	19.36
62	73.85	62.67	14.99	14.00
47	47.17	35.99	8.80	7.81

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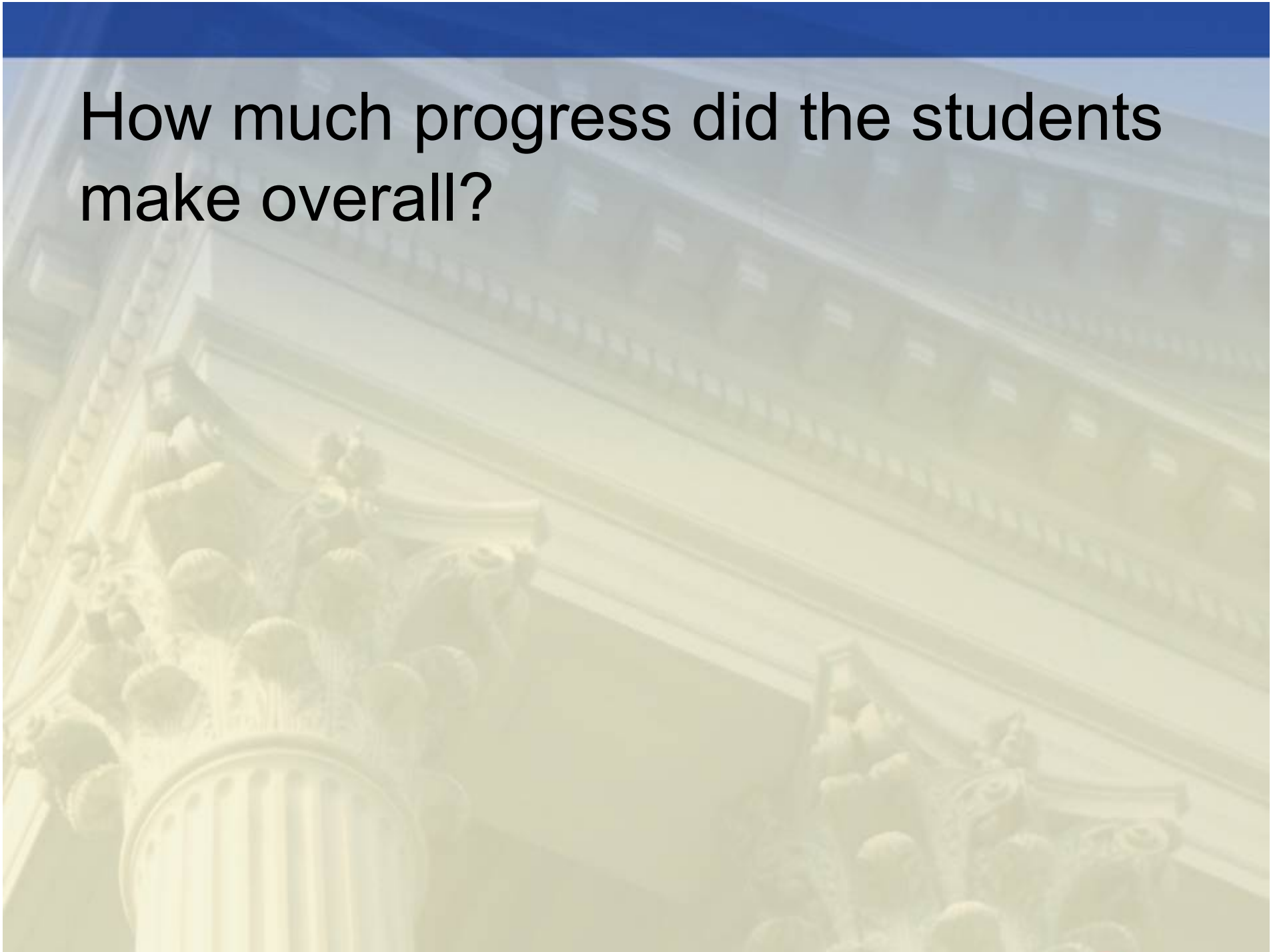
Results: RQ #1 Was the intervention effective? Yes!

- Measures Across Time (HLM)
 - The differences between the treatment and contrast group increase over time
 - These differences are statistically significant on all measures except WLPB-Word Identification
- Posttest Only (ANCOVA – IQ as covariate)
 - Treatment group significantly outperformed the contrast group on WIAT Reading Comprehension
 - Treatment and contrast groups performed similarly on WIAT Listening Comprehension

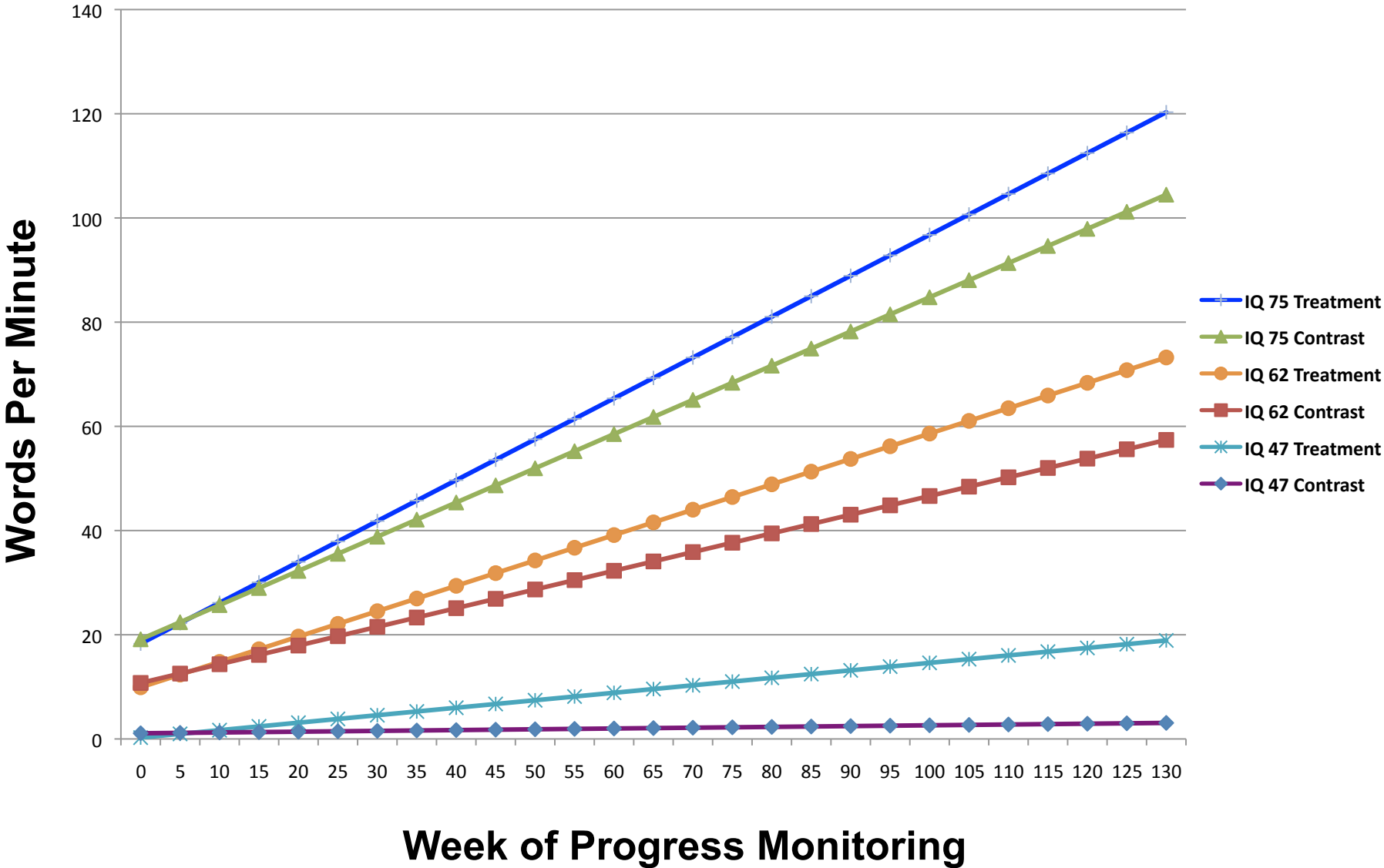
Results: RQ #2 What was the influence of IQ?

- Generally speaking, students with a higher IQ had higher scores at pretest and a higher rate of growth
- High variability of performance from year to year on standardized measures

How much progress did the students make overall?



Oral Reading Fluency: Predicted Scores by IQ and Condition

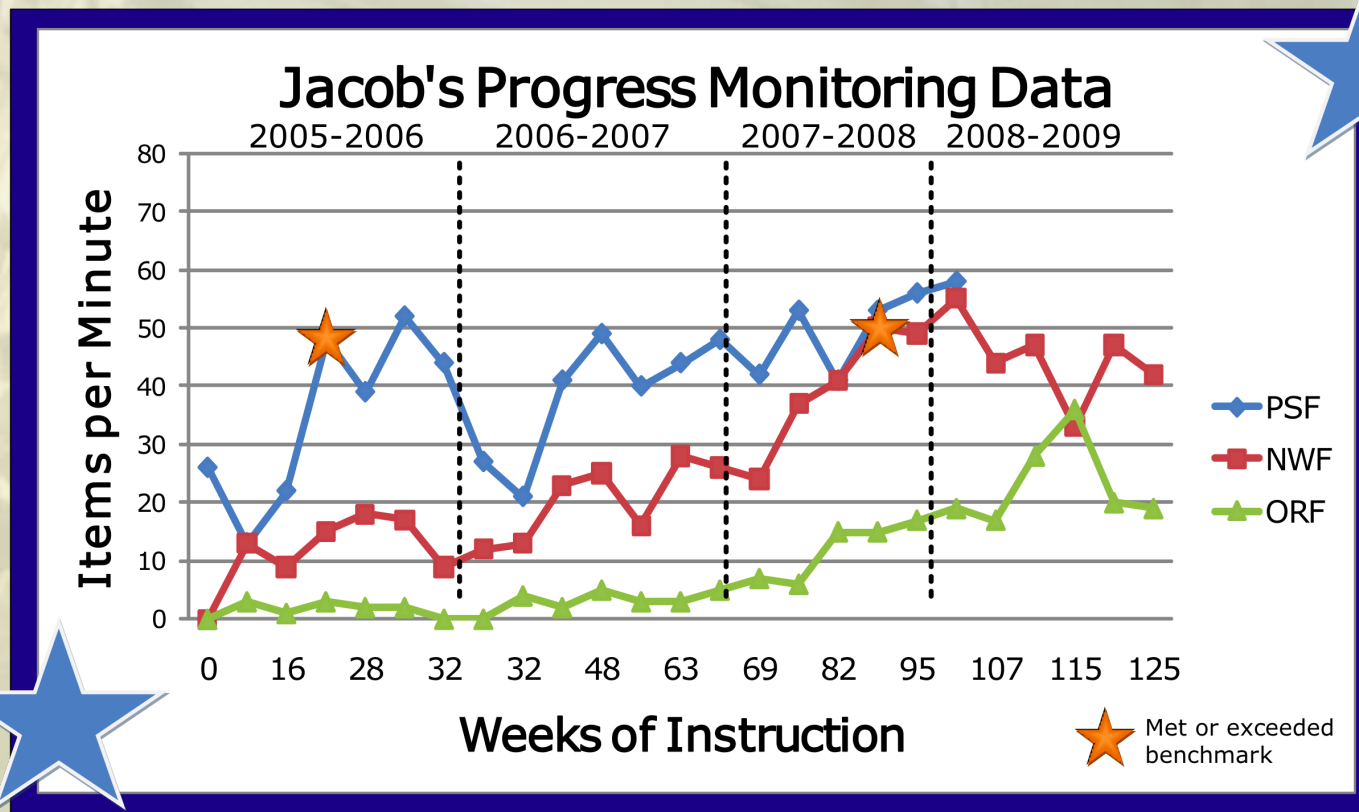


Some individual students...

- Students highlighted in articles
- Bart moved in the last year
- Carl experienced significant health problems and his reading progress stalled
- Rachel and Jacob continued in the study

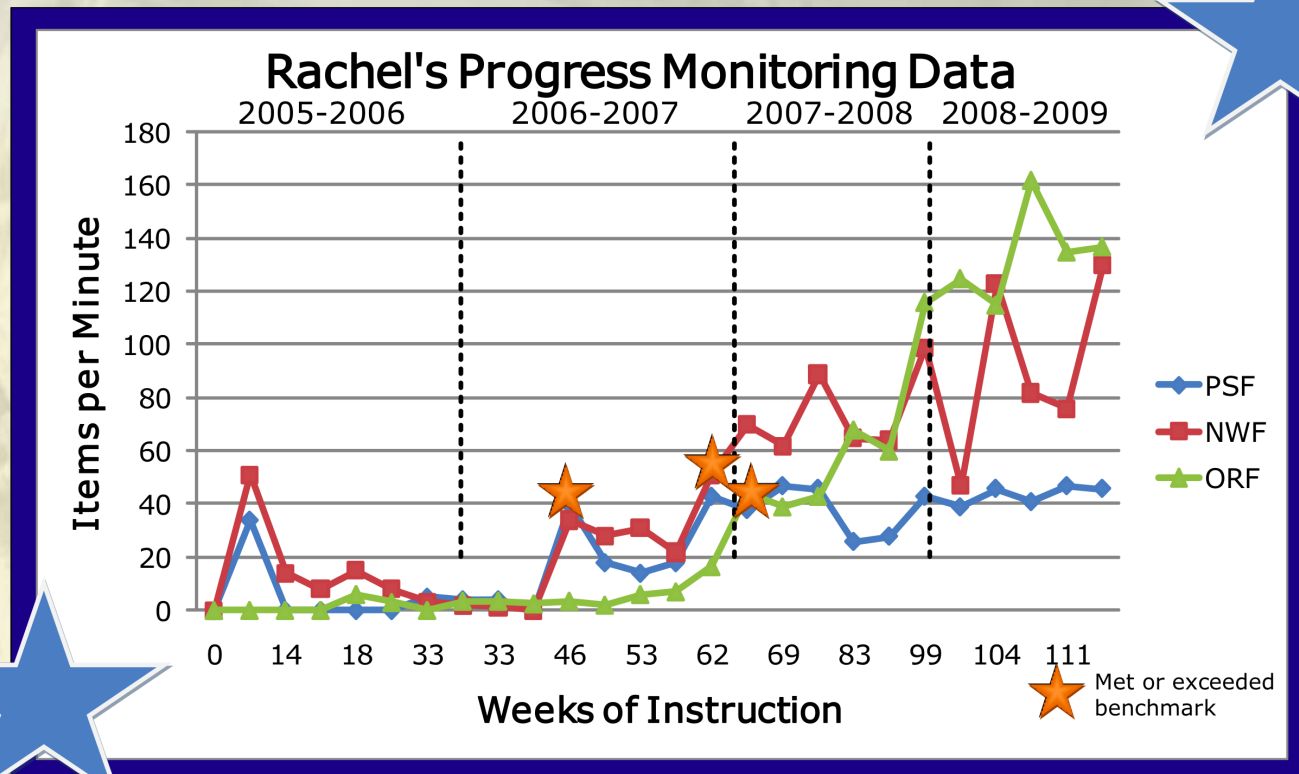
Jacob's Story

Jacob is a student with ID (Williams' Syndrome; IQ of 44, moderate range). In 2008-2009 Jacob was in 5th grade, placed in general education with resource support. Jacob began in Level K and was approximately half-way through Level 1 when he finished the study.



Rachel's Story

Rachel is a student with ID (IQ of 63, mild range). In 2008-2009 she was in 4th grade, placed in a self-contained unit for students with ID. Rachel began in Level K and was approximately half-way through Level 2 when she finished the study.



Summary Of Findings

- Support for use of scientifically-based reading instruction for students with low IQs (ID range)
- IF Individualized and with high degrees of fidelity
- IF provided **intensive**, comprehensive instruction over an extended period of time
- Every child should be given an opportunity to learn to read.

Limitations

- Performance among students highly variable
- Though relatively large sample size for population, it is a relatively small sample size for the statistical methods
- Intervention was complex and comprehensive, making it difficult to determine which parts were causing positive effects

Future Research

- More appropriate measures for students with ID
- Additional/more refined materials to use with students with ID
 - Increase intensity, including easy-to-use materials
 - More meaningful early literacy materials
- Analysis of reasonable goals
- Focus on teaching transfer of skills
 - Across activities and strands within instruction
 - To practical life skills
 - “Application Lessons” (see research poster)

Recommendations: Techniques

- Same general techniques as other struggling readers
- Implement interventions with high degrees of fidelity
- **Allor, J. H.**, Mathes, P. G., Champlin, T. M., & Cheatham, J. P. (2009). Research-based techniques for teaching early reading skills to students with intellectual disabilities. *Education and Training in Developmental Disabilities, 44*, 356-366.

Recommendations: Individualized

- Problem-solving team approach
 - Short-term memory
 - Oral language
 - Behavior
 - Transfer/Application of Skills
- Include reading specialists, special educators, behavioral specialists, speech language therapists, etc.
- **Allor, J. H.**, Mathes, P. G., Jones, F. G., Champlin, T. M., & Cheatham, J. P. (2010). Individualized research-based reading instruction for students with intellectual disabilities. *TEACHING Exceptional Children*, 42, 6-12.

Recommendations: Intense

- Extensive practice
- Motivating
- Meaningful
- **Allor, J. H.**, Champlin, T. M., Gifford, D. B., & Mathes, P. G. (2010). Methods for increasing the intensity of reading instruction for students with intellectual disabilities. *Education and Training in Autism and Developmental Disabilities, 45*, 500-511.
- **Allor, J. H.**, & Chard, D. J. (in press). A comprehensive approach to improving reading fluency for students with disabilities. *Focus on Exceptional Children*.

Resources

- Project Maximize
 - www.smu.edu/maximize
- Institute for Evidence-Based Education
 - smu.edu/education/evidencebasededucation
- Center for Academic Progress and Success
 - smu.edu/education/youth/caps
 - Melinda McGrath, Director
- *Early Interventions in Reading*
 - SRA/McGraw-Hill

Q & A