

# The Relationship Between Coaching and Successful Response to Intervention (RtI) Implementation

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# Advance Organizer

- Rationale for PS/RtI Model
- Professional Development for Educational Reform
- Coaching in the Literature
- The Study
  - Research Questions & Design
  - Participants, Measures, & Data Collection Procedures
  - Data Analysis, Results, & Conclusions
  - Implications for Practice & Future Research
  - Limitations

# Rationale for PS/RtI Model

- School Accountability Movement
  - No Child Left Behind Act (NCLB, 2002)
  - Individuals with Disabilities Education Improvement Act (IDEIA, 2004)
  - Blueprint for Reform: Reauthorization of the Elementary and Secondary Education Act (ESEA, 2010)
- Educational Service Delivery Reform

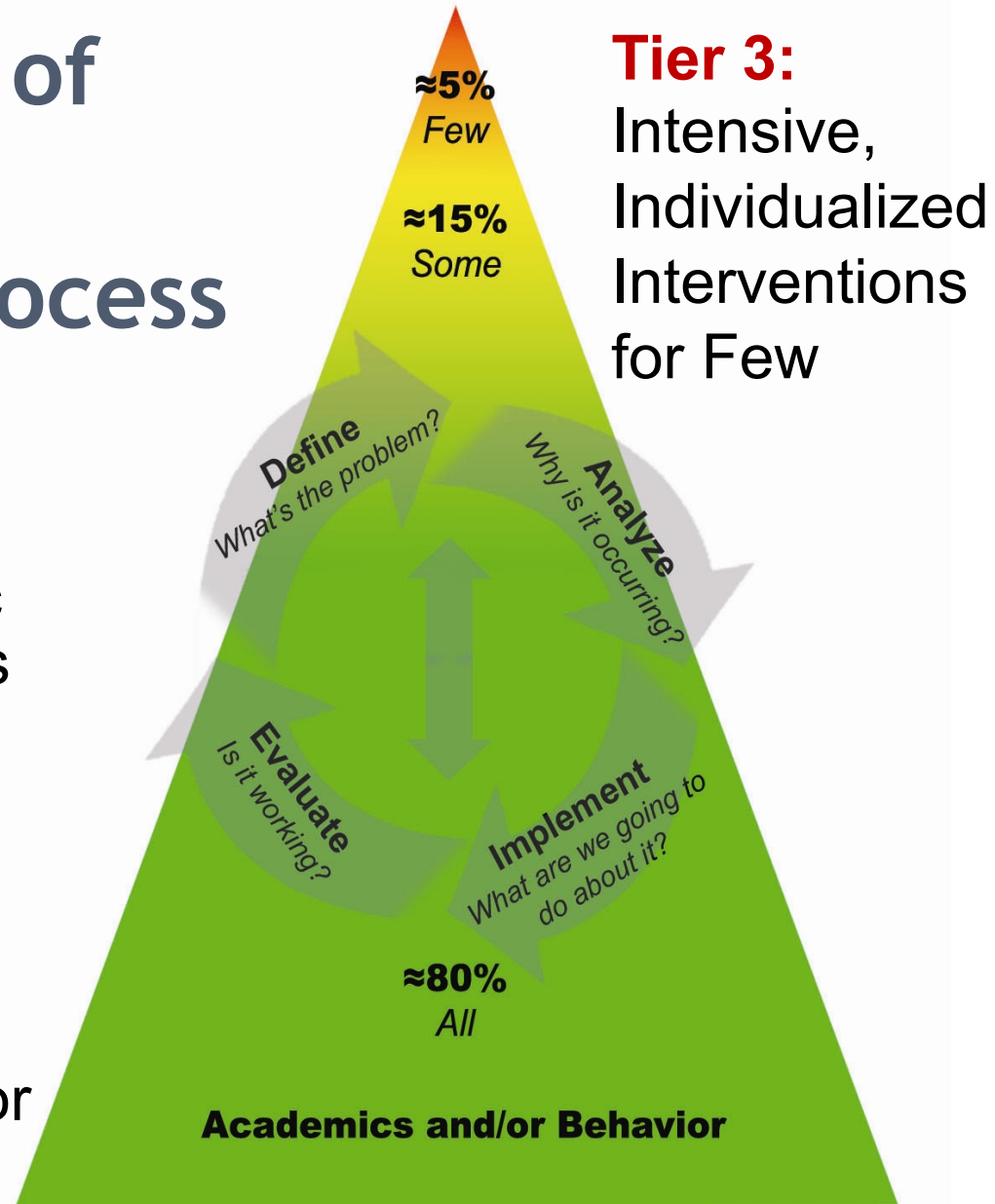
# PS/RtI Model of Service Delivery

- RtI is the practice of providing high quality instruction matched to student needs and utilizing data to make educational decisions about students (Batsche et al., 2005)
- Components of a PS/RtI Model
  - Integrated multi-tier model of service delivery
  - Problem-solving method
  - Integrated data collection and assessment system

# Multi-Tiered Model of Supports & the Problem-Solving Process

**Tier 2:** Targeted, Strategic Interventions & Supports for Some

**Tier 1:** Core, Universal Instruction & Supports for All



# Professional Development for Educational Reform

- **Historical Failure of School Reform Efforts** (Fullen, 2010; Hall & Hord, 2006; Hatch, 2001)
- **Professional Development for PS/RtI** (Batsche et al., 2005; Brown-Chidsey & Steege, 2005; Kratochwill, Volpiansky, Clements, & Ball, 2007)
- **School-Based Coaching for Professional Development** (Neufeld & Roper, 2005; Knight, 2009; Killion, 2010)

# Coaching in the Literature

- Theoretical Basis for Coaching
  - Adult Learning
  - Teacher Professional Development
- Coaching Models & Outcomes
  - Peer Coaching
  - Cognitive Coaching
  - Literacy Coaching
  - Instructional Coaching
- Coaches Knowledge, Skills, & Activities
- Evaluation of the Impact of Coaching

# Limitations of Previous Research

- Difficulties identifying consistent coaching (treatment) definition within and across studies
- Lack of sophisticated methods and/or dependent variables (i.e., limited to self-report, interviews, descriptive data)
- Limited research on the impact of coaching on the implementation of PS/RtI practices



# The Study

A decorative graphic consisting of a solid pink horizontal bar that transitions into a series of overlapping, slightly offset white and pink lines on the right side, creating a modern, layered effect.

# Research Question 1

What is the relationship between coaching and level of PS/RtI implementation in schools over time?

a) What is the relationship between coaching and level of PS/RtI consensus development in schools over time?

b) What is the relationship between coaching and level of PS/RtI infrastructure development in schools over time?

c) What is the relationship between coaching and level of PS/RtI implementation development in schools over time?

# Research Question 2

What is the relationship between coaching and level of fidelity of PS/RtI implementation in schools over time?

- a) What is the relationship between coaching and level of fidelity of problem identification implementation in schools over time?
- b) What is the relationship between coaching and level of fidelity of problem analysis implementation in schools over time?
- c) What is the relationship between coaching and level of fidelity of intervention development and implementation in schools over time?
- d) What is the relationship between coaching and level of fidelity of program evaluation/response to intervention implementation in schools over time?

# Research Design

- A longitudinal, correlational research design was employed using a subset of data collected from a three-year, statewide school reform initiative entitled the Florida Problem-Solving/Response to Intervention (PS/RtI) Project  
<http://www.floridarti.usf.edu/>
- The relationship between PS/RtI coaching activities, various educator and school variables, and the outcome measures of PS/RtI implementation and fidelity levels were examined

# Florida PS/RtI Project Description

- Funded by the Florida Department of Education
- 2 Main Components:
  - **Statewide training:** to provide training on the PS/RtI model to district teams across the state
  - **Demonstration sites:** to evaluate the impact of PS/RtI implementation
- Project Staff
  - 2 Project Co-Directors
  - 1 Project Leader
  - 2 Project Evaluators
  - 3 Regional Coordinators
  - 13 to 16 PS/RtI Coaches across the 7 districts

# Participants

- 34 pilot schools within 7 districts in the state of Florida, chosen through a competitive grant application process
  - Districts and schools varied by:
    - Geographic location
    - Student demographics
    - District and school size
- 21 Coaches over the 3-year period
  - 1 Coach per 3 pilot schools
- 34 School-Based Leadership Teams (SBLTs)
  - 6-8 staff members per pilot school

# Measures

- Data collected from multiple sources
  - Instruments developed by Project staff
- Validation process for instruments
  - Reviewed existing projects and literature
  - Expert Validation Panel (EVP) created
  - EVP reviewed each instrument and provided feedback
  - Project staff reviewed EVP feedback and incorporated changes
  - Factor analytic and reliability studies conducted

# Measures: SBLT Surveys

- *Beliefs Survey*
  - Assesses educators beliefs about core components of PS/RtI model
  - 3 Factors: 72% of common variance
  - Factor 1:  $\alpha = .87$ , Factor 2:  $\alpha = .79$ , & Factor 3:  $\alpha = .85$
- *Perceptions of RtI Skills Survey*
  - Assesses educators' perceptions of skills related to typical practices within a PS/RtI model
  - 3 Factors: 80% of common variance
  - Factor 1:  $\alpha = .97$ , Factor 2:  $\alpha = .97$ , & Factor 3:  $\alpha = .94$
- *Coaching Evaluation Survey*
  - Assesses educators' perceptions of the PS/RtI coaching received, and extent to which Coaches possessed required skills
  - 3 Factors: 95% of common variance
  - Factor 1:  $\alpha = .97$ , Factor 2:  $\alpha = .97$ , and Factor 3:  $\alpha = .96$



# Measures: PS/RtI Implementation & Integrity

- *Self-Assessment of Problem-Solving Implementation (SAPSI)*
  - Needs assessment and progress monitoring tool to evaluate PS/RtI implementation at the school level
  - Consensus  $\alpha = .64$ , Infrastructure Development  $\alpha = .89$ , & Implementation  $\alpha = .91$ .
- *Tier I & II Critical Components Checklist*
  - Assesses degree to which steps of the PS/RtI process are present when educators evaluate core (Tier I) and supplemental (Tier II) instruction
  - Content Validity: Items parallel steps of PS/RtI
  - Fall 2007:  $\alpha = .90$ , Winter 2008:  $\alpha = .91$ , & Spring 2008:  $\alpha = .90$

# Measures: Coaching Activities

- *PS/RtI Coaches Log System*
  - Web-based data collection system documenting Coaches daily activities in the following areas:
    - **Training**
    - **Technical Assistance**
    - Project Data Collection
    - Meeting
    - Other
  - Coaches received initial training and ongoing technical assistance from Project staff on utilization of Log System

# Project Training & Technical Assistance

- Coaches
  - Formal on-site training each year
    - 18 days total
  - Ongoing training and technical assistance as needed
    - Site-based and conference calls
- SBLTs
  - Formal on-site training each year
    - 13 days total
  - Ongoing training and technical assistance as needed

# Data Collection Procedures

- Three years of Project implementation data
- Data collected from variety of sources
- See *2007-2010 Data Collection, Entry, and Analysis Rubric* for complete description of data collected & used in current study

# Data Collection Procedures (cont.)

- Data from instruments were entered by trained graduate assistants
  - Inter-rater agreement conducted on 15% of data entered
  - 90% agreement was minimum criteria
  - Data were rechecked for accuracy if agreement estimate was less than 90%
  - When estimates fell below 90%, all data were rechecked & inter-rater agreement process continued

# Multi-level Modeling

- Allows for analysis of “nested” data by investigating relationship between variables at multiple levels of the dependent variable(s)
- Each model is built hierarchically
- Variables entered at “higher” levels used to predict outcomes at “lower” levels

# Data Analysis

- Multi-Level Modeling
  - 2-level models were examined for each research question
    - Level 1: Time (3 time points)
      - Covariate: Coaching Evaluation Survey
    - Level 2: School Variables
      - Coaching-Related Variables
      - Change in SBLTs' Beliefs & RtI Skills
      - School-Related Variables

# Assumptions of Multi-Level Modeling (MLM)

- 1) Data are normally distributed
- 2) Missing data are randomly distributed
- 3) Data are nested
- 4) Residual variances are normally distributed



# Results: Assumptions

Assumption	Research Question		
	1a	1b	1c
1) Normally Distributed Data: Level-1 Time Level-1 Covariate Level-2 Variables	X - X	X - X	X - X
2) Randomly Distributed Missing Data: Level-1 Time Level-1 Covariate Level-2 Variables	X X X	X X X	X X X
3) Nested Data	-	-	-
4) Normally Distributed Residual Variances	X	X	X

# Results: Assumptions, cont.

Assumption	Research Question			
Assumption	2a	2b	2c	2d
1) Normally Distributed Data: Level-1 Time Level-1 Covariate Level-2 Variables	X - X	X - X	X - X	X - X
2) Randomly Distributed Missing Data: Level-1 Time Level-1 Covariate Level-2 Variables	-* X X	-* X X	-* X X	-* X X
3) Nested Data	X	X	X	X
4) Normally Distributed Residual Variances	X	X	X	X

# Relationship between Coaching and Reported PS/RtI Implementation in Schools Over Time

Research Questions 1a-c



Parameter	Model 4 of 9
Intercept ( $\pi_{00}$ )	1.71 (.07)***
<b>Level 1</b>	
( $\pi_{10}$ ) Time	.60 (.13)***
( $\pi_{20}$ ) Coach Quality	.16 (.08)
<b>Level 2</b>	
( $\beta_{11}$ ) Training Frequency*Time	.04 (.02)*
( $\beta_{12}$ ) Training Duration*Time	-.01 (.01)*
( $\beta_{13}$ ) TA Frequency*Time	-.01 (.00)*
( $\beta_{14}$ ) TA Duration*Time	.00 (.00)
( $\beta_{15}$ ) Continuity*Time	.03 (.11)
<b>Variances</b>	
( $\sigma^2$ )	.16
( $r_{00}$ ) Intrcpt	.04*
( $r_{11}$ ) Time Slp	--
<b>Deviance</b>	167.62
<b>Parameters</b>	2
<b>AIC</b>	171.62
<b>BIC</b>	174.67

## Results: Consensus Development (1a)

$$\begin{aligned}
 Y_{ti} &= \beta_{00} + \beta_{10} \text{Time}_{ti} + \beta_{11} \text{Training} \\
 &\text{Frequency}_i * \text{Time}_{ti} + \beta_{12} \text{Traini} \\
 &\text{ng Duration}_i * \text{Time}_{ti} + \beta_{13} \text{TA} \\
 &\text{Frequency}_i * \text{Time}_{ti} + \beta_{14} \text{TA} \\
 &\text{Duration}_i * \text{Time}_{ti} + \beta_{15} \\
 &\text{Continuity}_i * \text{Time}_{ti} + \beta_{20} \\
 &\text{Coach Quality}_{ti} + r_{0i} + e_{ti}
 \end{aligned}$$

Note. Values based on HLM 6 using restricted maximum likelihood (REML) estimation. Entries show parameter estimates with standard errors in parentheses. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Parameter	Model 3 of 10
Intercept ( $\pi_{00}$ )	1.48 (.07)***
<b>Level 1</b>	
( $\pi_{10}$ ) Time	.60 (.03)***
( $\pi_{20}$ ) Coach Quality	.03 (.06)
<b>Level 2</b>	
( $\beta_{11}$ ) Training Frequency*Time	
( $\beta_{12}$ ) Training Duration*Time	
( $\beta_{13}$ ) TA Frequency*Time	
( $\beta_{14}$ ) TA Duration*Time	
( $\beta_{15}$ ) Continuity*Time	
<b>Variances</b>	
( $\sigma^2$ )	.07
( $r_{00}$ ) Intrcpt	.10***
( $r_{11}$ ) Time Slp	--
<b>Deviance</b>	79.97
<b>Parameters</b>	2
<b>AIC</b>	83.97
<b>BIC</b>	87.03

# Results: Infrastructure Development (1b)

$$Y_{ti} = \beta_{00} + \beta_{10} \text{Time}_{ti} + \beta_{20} \text{Coach Quality}_{ti} + r_{0i} + e_{ti}$$

Note. Values based on HLM 6 using restricted maximum likelihood (REML) estimation. Entries show parameter estimates with standard errors in parentheses.  
\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Parameter	Model 4 of 10
Intercept ( $\pi_{00}$ )	1.17 (.06)***
<b>Level 1</b>	
( $\pi_{10}$ ) Time	.64 (.11)***
( $\pi_{20}$ ) Coach Quality	
<b>Level 2</b>	
( $\beta_{11}$ ) Training Frequency*Time	.00 (.01)
( $\beta_{12}$ ) Training Duration*Time	-.00 (00)
( $\beta_{13}$ ) TA Frequency*Time	-.00 (00)
( $\beta_{14}$ ) TA Duration*Time	-.00 (.00)
( $\beta_{15}$ ) Continuity*Time	.22 (.09)*
<b>Variances</b>	
( $\sigma^2$ )	.10
( $r_{00}$ ) Intrcpt	.05***
( $r_{11}$ ) Time Slp	--
<b>Deviance</b>	127.13
<b>Parameters</b>	2
<b>AIC</b>	131.13
<b>BIC</b>	134.19

# Results: Implementation Development (1c)

$$Y_{ti} = \beta_{00} + \beta_{10} \text{Time}_{ti} + \beta_{11} \text{Training Frequency}_i * \text{Time}_{ti} + \beta_{12} \text{Training Duration}_i * \text{Time}_{ti} + \beta_{13} \text{TA Frequency}_i * \text{Time}_{ti} + \beta_{14} \text{TA Duration}_i * \text{Time}_{ti} + \beta_{15} \text{Continuity}_i * \text{Time}_{ti} + r_{0i} + e_{ti}$$

Note. Values based on HLM 6 using restricted maximum likelihood (REML) estimation. Entries show parameter estimates with standard errors in parentheses. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

# Relationship between Coaching and Evidence of Fidelity of PS/RtI Implementation in Schools Based on Assessment of Permanent Products Over Time

Research Questions 2a-d



Parameter	Model 7 of 9
Intercept ( $\pi_{00}$ )	1.06 (.15)***
<b>Level 1</b>	
( $\pi_{10}$ ) Time	.73 (.20)***
( $\pi_{20}$ ) Coach Quality	.12 (.12)
<b>Level 2</b>	
( $\beta_{11}$ ) Training Frequency*Time	-.00 (.02)
( $\beta_{12}$ ) Training Duration*Time	-.01 (.01)
( $\beta_{13}$ ) TA Frequency*Time	.00 (.01)
( $\beta_{14}$ ) TA Duration*Time	.00 (.00)
( $\beta_{15}$ ) Continuity*Time	-.34 (.15)*
( $\beta_{112}$ ) Change in Per. Skills D1*Time	-.59 (.45)
( $\beta_{113}$ ) Change in Per. Skills D2*Time	-.33 (.34)
( $\beta_{114}$ ) Change in Per. Skills D3*Time	.79 (.31)*
<b>Variances</b>	
( $\sigma^2$ )	.16
( $r_{00}$ ) Intrcpt	.53***
( $r_{11}$ ) Time Slp	.06**
<b>Deviance</b>	187.86
<b>Parameters</b>	4
<b>AIC</b>	195.86
<b>BIC</b>	201.60

# Results: Problem Identification (2a)

$$\begin{aligned}
 Y_{ti} &= \beta_{00} + \beta_{10} \text{Time}_{ti} + \beta_{11} \text{Training} \\
 &\text{Frequency}_i^* \text{Time}_{ti} + \beta_{12} \text{Training} \\
 &\text{Duration}_i^* \text{Time}_{ti} + \beta_{13} \text{TA} \\
 &\text{Frequency}_i^* \text{Time}_{ti} + \beta_{14} \text{TA} \\
 &\text{Duration}_i^* \text{Time}_{ti} + \\
 &\beta_{15} \text{Continuity}_i^* \text{Time}_{ti} + \\
 &\beta_{16} \text{Skills}_1^* \text{Time}_{ti} + \\
 &\beta_{17} \text{Skills}_2^* \text{Time}_{ti} + \\
 &\beta_{18} \text{Skills}_3^* \text{Time}_{ti} + \beta_{20} \text{Coach} \\
 &\text{Quality}_{ti} + r_{0i} + r_{1i}^* \text{Time}_{ti} + e_{ti}
 \end{aligned}$$

Note. Values based on HLM 6 using restricted maximum likelihood (REML) estimation. Entries show parameter estimates with standard errors in parentheses. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .



Parameter	Model 4 of 9
Intercept ( $\pi_{00}$ )	.36 (.10)**
<b>Level 1</b>	
( $\pi_{10}$ ) Time	.72 (.21)**
( $\pi_{20}$ ) Coach Quality	.17 (.13)
<b>Level 2</b>	
( $\beta_{11}$ ) Training Frequency*Time	.06 (.02)*
( $\beta_{12}$ ) Training Duration*Time	-.02 (.01)**
( $\beta_{13}$ ) TA Frequency*Time	-.01 (.00)
( $\beta_{14}$ ) TA Duration*Time	.01 (.00)
( $\beta_{15}$ ) Continuity*Time	-.34 (.17)
<b>Variances</b>	
( $\sigma^2$ )	.23
( $r_{00}$ ) Intrcpt	.12***
( $r_{11}$ ) Time Slp	--
<b>Deviance</b>	192.78
<b>Parameters</b>	2
<b>AIC</b>	196.78
<b>BIC</b>	199.65

## Results: Problem Analysis (2b)

$$\begin{aligned}
 Y_{ti} &= \beta_{00} + \beta_{10} * Time_{ti} + \beta_{11} Training \\
 &Frequency_i * Time_{ti} + \beta_{12} Training \\
 &Duration_i * Time_{ti} + \beta_{13} TA \\
 &Frequency_i * Time_{ti} + \beta_{14} TA \\
 &Duration_i * Time_{ti} + \\
 &\beta_{15} Continuity_i * Time_{ti} + \\
 &\beta_{20} Coach Quality_{ti} + r_{0i} + e_{ti}
 \end{aligned}$$

Note. Values based on HLM 6 using restricted maximum likelihood (REML) estimation. Entries show parameter estimates with standard errors in parentheses. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Parameter	Model 3 of 9
Intercept ( $\pi_{00}$ )	.22 (.47)
<b>Level 1</b>	
( $\pi_{10}$ ) Time	.31 (.06)***
( $\pi_{20}$ ) Coach Quality	.05 (.11)
<b>Level 2</b>	
( $\beta_{11}$ ) Training Frequency*Time	
( $\beta_{12}$ ) Training Duration*Time	
( $\beta_{13}$ ) TA Frequency*Time	
( $\beta_{14}$ ) TA Duration*Time	
( $\beta_{15}$ ) Continuity*Time	
<b>Variances</b>	
( $\sigma^2$ )	.17
( $r_{00}$ ) Intrcpt	.07
( $r_{11}$ ) Time Slp	.03
<b>Deviance</b>	146.93
<b>Parameters</b>	4
<b>AIC</b>	154.93
<b>BIC</b>	160.66

# Results: Intervention Development & Implementation (2c)

$$Y_{ti} = \beta_{00} + \beta_{10} * Time_{ti} + \beta_{20} * Coach Quality + r_{0i} + r_{1i} * Time_{ti} + e_{ti}$$

Note. Values based on HLM 6 using restricted maximum likelihood (REML) estimation. Entries show parameter estimates with standard errors in parentheses. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Parameter	Model 7 of 11
Intercept ( $\pi_{00}$ )	-.84 (.48)
<b>Level 1</b>	
( $\pi_{10}$ ) Time	.27 (.22)
( $\pi_{20}$ ) Coach Quality	.31 (.10)**
<b>Level 2</b>	
( $\beta_{11}$ ) Training Frequency*Time	-.01 (.02)
( $\beta_{12}$ ) Training Duration*Time	.01 (.01)
( $\beta_{13}$ ) TA Frequency*Time	-.01 (.01)
( $\beta_{14}$ ) TA Duration*Time	.00 (.00)
( $\beta_{15}$ ) Continuity*Time	.32 (.17)
( $\beta_{112}$ ) Change in Per. Skills D1*Time	.50 (.52)
( $\beta_{113}$ ) Change in Per. Skills D2*Time	-.08 (.39)*
( $\beta_{114}$ ) Change in Per. Skills D3*Time	.12 (.35)
<b>Variances</b>	
( $\sigma^2$ )	.13
( $r_{00}$ ) Intrcpt	.22***
( $r_{11}$ ) Time Slp	--
<b>Deviance</b>	167.59
<b>Parameters</b>	2
<b>AIC</b>	171.59
<b>BIC</b>	174.46

# Results: Program Evaluation/Rtl (2d)

$$\begin{aligned}
 Y_{ti} = & \beta_{00} + \beta_{10} * Time_{ti} + \beta_{11} Training \\
 & Frequency_i * Time_{ti} + \beta_{12} Training \\
 & Duration_i * Time_{ti} + \beta_{13} TA \\
 & Frequency_i * Time_{ti} + \beta_{14} TA \\
 & Duration_i * Time_{ti} + \\
 & \beta_{15} Continuity_i * Time_{ti} + \\
 & \beta_{16} Skills\_1_i * Time_{ti} + \\
 & \beta_{17} Skills\_2_i * Time_{ti} + \\
 & \beta_{18} Skills\_3_i * Time_{ti} + \beta_{20} Coach \\
 & Quality_{ti} + r_{0i} + e_{ti}
 \end{aligned}$$

Note. Values based on HLM 6 using restricted maximum likelihood (REML) estimation. Entries show parameter estimates with standard errors in parentheses.  
\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

# Conclusions

## ***Consensus:***

- Positively related to coaching in the form of shorter yet more frequent training sessions and associated with fewer technical assistance sessions provided by PS/RtI coaches, after controlling for perceptions of coaching quality

## ***Infrastructure:***

- Positively related to time only

# Conclusions, cont.

## ***Implementation***

- Predicted positively by the continuity of the coaching received, or the degree to which coaching was delivered by the same individual over the three years of the Project

## ***Problem Identification***

- Positively related to changes in perceived RtI skill levels related to manipulation of data and use of technology in schools, and negatively related to coach continuity, after controlling for coaching quality

# Conclusions, cont.

## ***Problem Analysis***

- Predicted positively by the frequency of training sessions conducted by PS/RtI coaches, and negatively by the duration of training sessions, after controlling for perceived quality

## ***Intervention Development & Implementation***

- Positively related to time only

## ***Program Evaluation/RtI***

- Predicted positively by the SBLTs' perceptions of coaching quality across the three Project years & negatively by SBLTs' changes in perceived RtI skill levels related to behavior content

# Implications for PS/RtI Coaching Practices

## ***Coaching Roles & Responsibilities***

- Consider adhering to short, yet frequent professional development training sessions
- Consider scheduling continuous coaching assignments or responsibilities

## ***Evaluation of Coaching***

- Consider gathering data from a variety of stakeholders and measurement approaches when evaluating coaches and coaching programs
- Consider stakeholder skill development when determining coaching impact
- Consider time required for evidence of systemic reform efforts

# Implications for Future Research

- Continue monitoring outcomes over time
- Examine more specific coaching activities
- Include additional Level-1 time-varying covariates
- Explore coach continuity independent of and in combination with other variables
- Investigate relationship between PS/RtI outcomes and additional measures of coaching quality



# Limitations

- Longitudinal, correlational research design did not allow for cause-and-effect relationships to be determined
- Violation of missing data assumption
- Lack of control over coaches' selection & hiring, day-to-day activities, and possible data entry issues
- Growth curve analysis restricted to 3 time points
- Potential issues with self-report measurement

# Questions?

- Thank You!

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