Exploring the Efficacy of an CBM-Focused Field Experience through a District and University Partnership

Valerie JH Sherman and Corey Pierce, PhD

With major contributions from
Shirley Jirik, Robert Pearson , and Scott Kreider.

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Overview

- Background
- Purpose
- Methods
- Results
- Future Directions

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Background

- Educational accountability
- Assessment literacy
- Field-based experiences
- Curriculum-based measures (CBM)

The Age of Accountability

- **Increased demand for student-level data**
  - The spread of RTI/MTSS (NASDSE, 2006; Spectrum K12, 2010)
    - Data to guide instructional decisions
    - Focus on student growth over time
    - SPED eligibility when necessary
  - Teacher Accountability
    - Data determines teacher effectiveness
    - Balance need for data, instruction and time limitations within school day
- **Increased demand creates an increased need for resources**

Assessment Literacy

"Assessment literacy is a sine qua non for today's competent educator, and must be a pivotal content area in preservice teacher education programs" (Popham, 2009, p. 4).

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Assessment Literacy (continued)

In-service and preservice teachers need to be able to:

1. Gather valid and reliable data
2. Monitor student progress
3. Communicate student progress effectively
4. Provide differentiated instruction

(Reschly & Wood-Garnett, 2009)

Field-based experiences

- Older single-semester student teaching models tend to be ineffective (Prater & Sileo, 2002).

- Multi-semester student teaching experiences help preservice teachers feel prepared and effective (Ronfelt & Reininger, 2012).

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Curriculum-based measures

Center on Response to Intervention

CBM tools chart

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Purpose of the Project

- **Determine whether UNC teacher candidates would be a viable resource to work in schools to assist in the collection of CBM data.**
  - Do they administer the assessments accurately?
  - Do the teachers/schools find it beneficial?
  - Do the UNC teacher candidates find it beneficial?
  - Do elementary student CBM scores change significantly when UNC teacher candidate administers the assessment?

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The Partnership

- Partnerships between schools and universities often lead to positive outcomes for the partner-schools (Prater & Sileo, 2002)
  - Suburban Colorado school district
    - 6 Elementary Schools
      - Each assigned a "Cooperating Teacher"
        - Designee contact between university and school
      - Each school was assigned 1 university special education teacher candidate

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The Project

- Trained UNC special education teacher candidates to administer AIMSweb R-CBM assessments
- Collected the following data:
  - Fidelity of implementation for candidate and cooperating teacher
  - Student R-CBM scores for candidate and cooperating teacher
  - Candidate and cooperating teacher survey and interview data on specific aspects of the project

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School Personnel in the Project

- Who were the Cooperating Teachers?
  - 6 Elementary Teachers/Reading Specialists
    - All with either a Master's Degree or Ph.D

Teacher Candidates in the Project

- Who were they?
  - 6 Special Education majors: 4 Seniors, 2 Juniors
    - Final 2 or 3 semesters of their program
    - Completed course – Introduction to Special Education Assessment
    - Cumulative GPA of 3.0 or higher
    - First 6 to sign up and meet above criteria.

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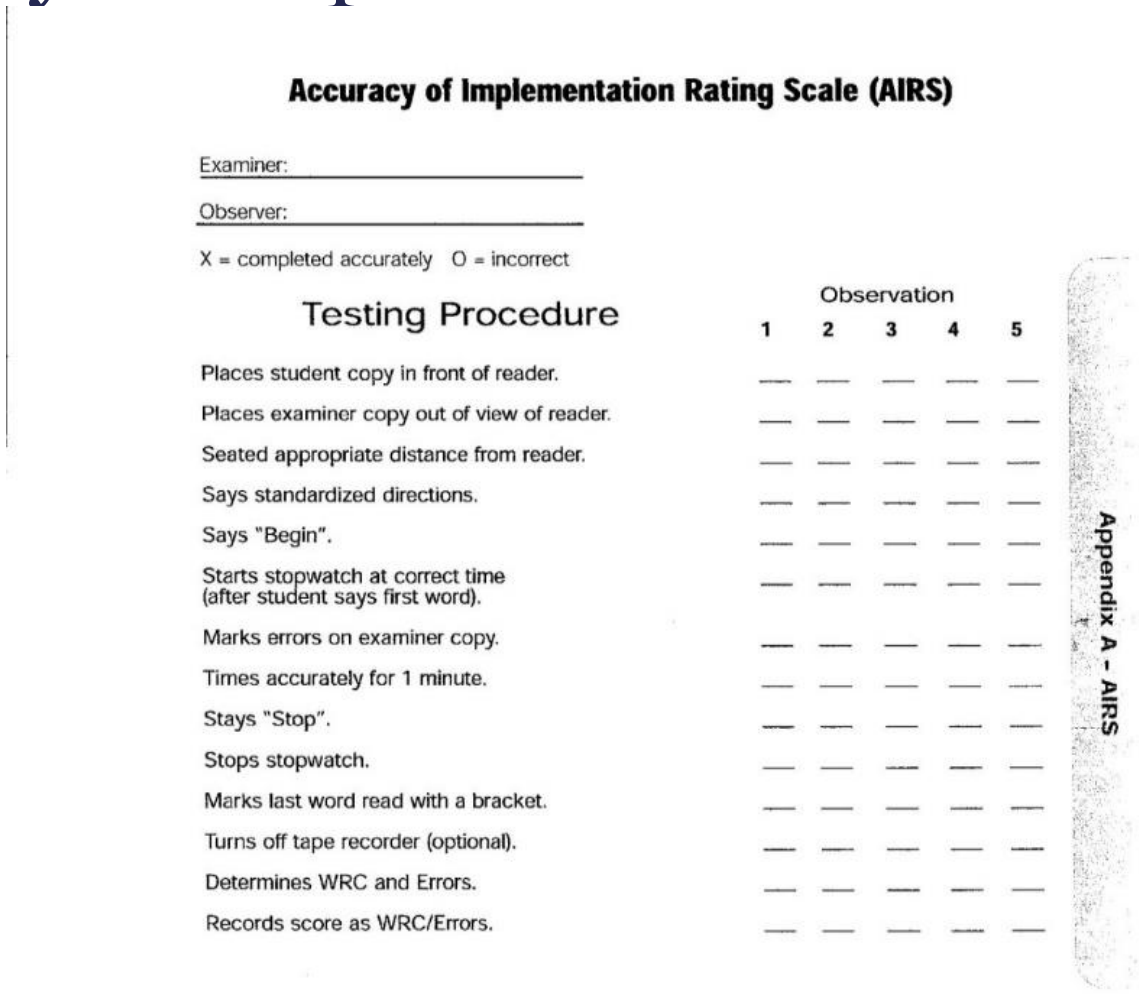
BIG QUESTION!

Can the teacher candidates implement R-CBM with fidelity?

Example of AIRS Used to Measure Fidelity of Implementation



Accuracy of Implementation Rating Scale (AIRS)

Examiner: _____

Observer: _____

X = completed accurately O = incorrect

Testing Procedure	Observation 1	2	3	4	5
Places student copy in front of reader.					
Places examiner copy out of view of reader.					
Seated appropriate distance from reader.					
Says standardized directions.					
Says "Begin".					
Starts stopwatch at correct time (after student says first word).					
Marks errors on examiner copy.					
Times accurately for 1 minute.					
Stays "Stop".					
Stops stopwatch.					
Marks last word read with a bracket.					
Turns off tape recorder (optional).					
Determines WRC and Errors.					
Records score as WRC/Errors.					

Appendix A - AIRS

Fidelity of Implementation and Inter-rater Reliability

- AIMSweb Implementation Rating Scale
  - **Teacher Candidate**: 98.6% accurate implementation overall
  - **Cooperating Teacher**: 93.8% accurate implementation overall
- Inter-rater reliability
  - Calculated same score 99% of the time.

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Individual AIRS Results

Cooperating Teacher

Variables	N	Mean
Place student copy in front of reader.	25	1.0000
Place examiner copy out of view of reader	25	1.0000
Says standardized direction	25	.7600
Says "Begin"	25	.8800
Start stopwatch at correct time	25	1.0000
Marks errors on examiner copy	25	1.0000
Times accurately for 1 minute	25	.9600
Say "Stop"	25	.7600
Stops stopwatch	25	1.0000
Marks last word read with a bracket	25	.9600
Determines WRC and errors	25	1.0000
Valid N (listwise)	25	

University Teacher Candidate

Variables	N	Mean
Place student copy in front of reader.	63	1.0000
Place examiner copy out of view of reader	63	1.0000
Says standardized direction	63	1.0000
Says "Begin"	63	1.0000
Start stopwatch at correct time	63	1.0000
Marks errors on examiner copy	63	1.0000
Times accurately for 1 minute	63	1.0000
Say "Stop"	63	.8413
Stops stopwatch	63	1.0000
Marks last word read with a bracket	63	1.0000
Determines WRC and errors	63	1.0000
Valid N (listwise)	63	

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Analysis of student-level data

- **RQ:** Do student scores on R-CBM change in concordance with administration by UNC teacher candidates vs. cooperating teachers?

- Have multiple repeated scores for each student
  - Beginning with several by cooperating teacher
  - Followed by some with varying administrator (candidate or teacher)

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Multilevel Model for Change

1. Model individual growth trajectories

2. Introduce UnivAdmin
   - 0 = ‘Admin by Teacher Candidate’
   - 1 = ‘Admin by UNC Cooperating Teacher’

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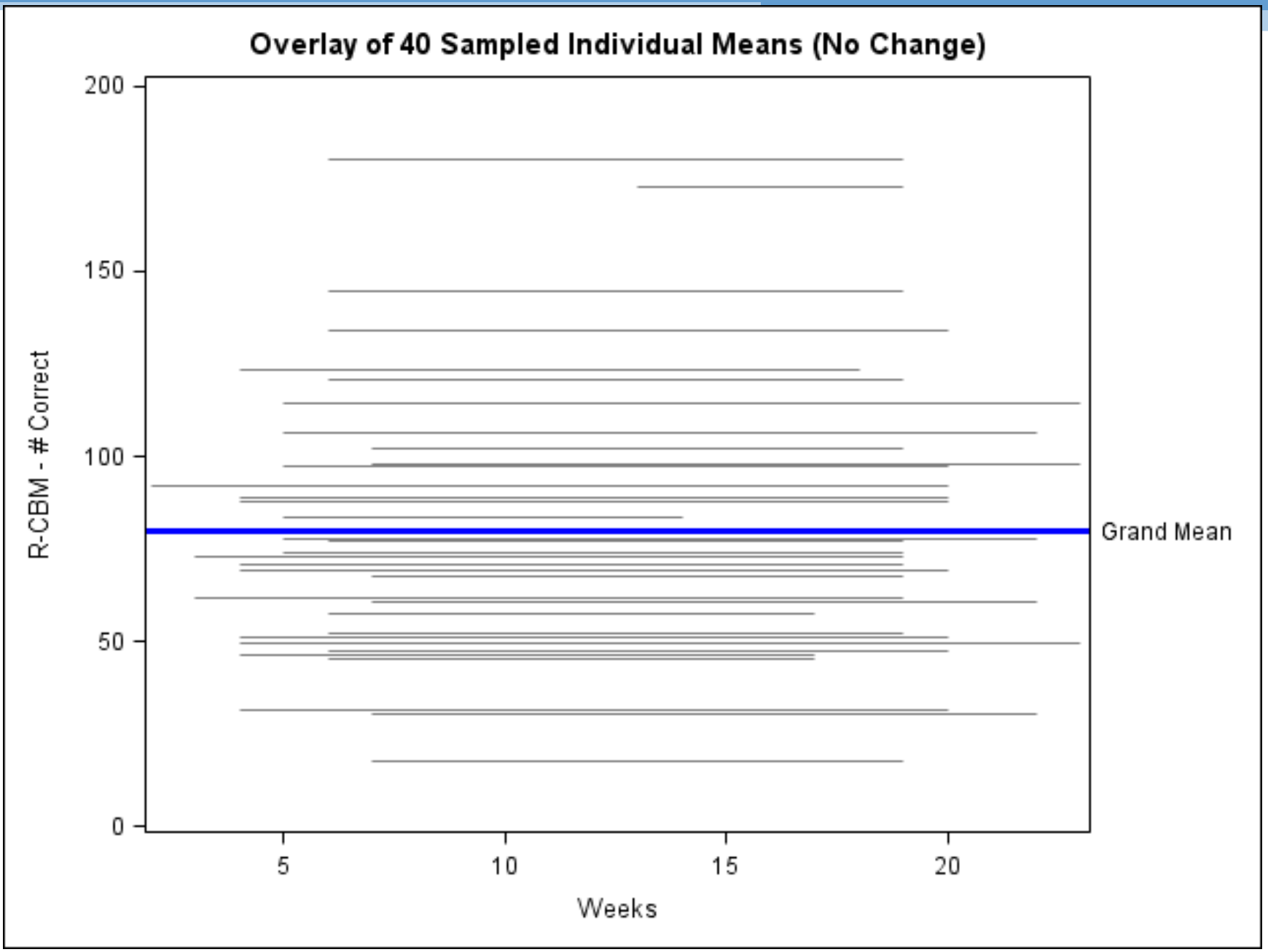
Model Sequence (Singer & Willett, 2003)

Model	Level-1 Model	Level-2 Model
A. Unconditional Means	$Y_{ij} = \pi_{0i} + \varepsilon_{ij}$	$\pi_{0i} = \gamma_{00} + \zeta_{0i}$
B. Unconditional Growth	$Y_{ij} = \pi_{0i} + \pi_{1i}TIME_{ij} + \varepsilon_{ij}$	$\pi_{0i} = \gamma_{00} + \zeta_{0i}$ $\pi_{1i} = \gamma_{10} + \zeta_{1i}$
C. Effects of *AboveGrade* (Level-2 Covariate)	$Y_{ij} = \pi_{0i} + \pi_{1i}TIME_{ij} + \varepsilon_{ij}$	$\pi_{0i} = \gamma_{00} + \gamma_{01}AG_i + \zeta_{0i}$ $\pi_{1i} = \gamma_{10} + \gamma_{11}AG_i + \zeta_{1i}$
D. Effect of *AboveGrade* on intercept only	$Y_{ij} = \pi_{0i} + \pi_{1i}TIME_{ij} + \varepsilon_{ij}$	$\pi_{0i} = \gamma_{00} + \gamma_{01}AG_i + \zeta_{0i}$ $\pi_{1i} = \gamma_{10} + \zeta_{1i}$
E. Effect of UnivAdmin on Intercept only	Y_{ij} $= \pi_{0i} + \pi_{1i}TIME_{ij} + \pi_{2i}UA_{ij} + \varepsilon_{ij}$	$\pi_{0i} = \gamma_{00} + \gamma_{01}AG_i + \zeta_{0i}$ $\pi_{1i} = \gamma_{10} + \zeta_{1i}$
F. Effect of UnivAdmin on Intercept & Growth Rate	Y_{ij} $= \pi_{0i} + \pi_{1i}TIME_{ij} + \pi_{2i}UA_{ij}$ $+ \pi_{3i}(TIME_{ij} \times UA_{ij}) + \varepsilon_{ij}$	

Model A: Unconditional Means

- No model for change over time (flat trajectories)
  - Person i's score at time j (Y_{ij}) deviates from his/her true mean (π_{oi}) by ε_{ij}
- Purpose: Partition variation in scores
  - Variation in person-specific means
  - Variation in person's scores about his/her mean


Overlay of 40 Sampled Individual Means (No Change)
200
150
100
50
0
R-CBM - # Correct
5
10
15
20
Weeks
Grand Mean

Variance Estimates & Standard Errors
(bold if sig. at .05)

Level 1

Within-person **238.0**

6.2

Sig. amount of unexplained within-person variation

Level 2

Init Status **1524.4**

97.5

Variation mostly among students

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Model B: Unconditional Growth

- Include TIME as predictor (Level-1)
- Person i's score at time j (Y_{ij}) deviates by ε_{ij} from his/her true change trajectory

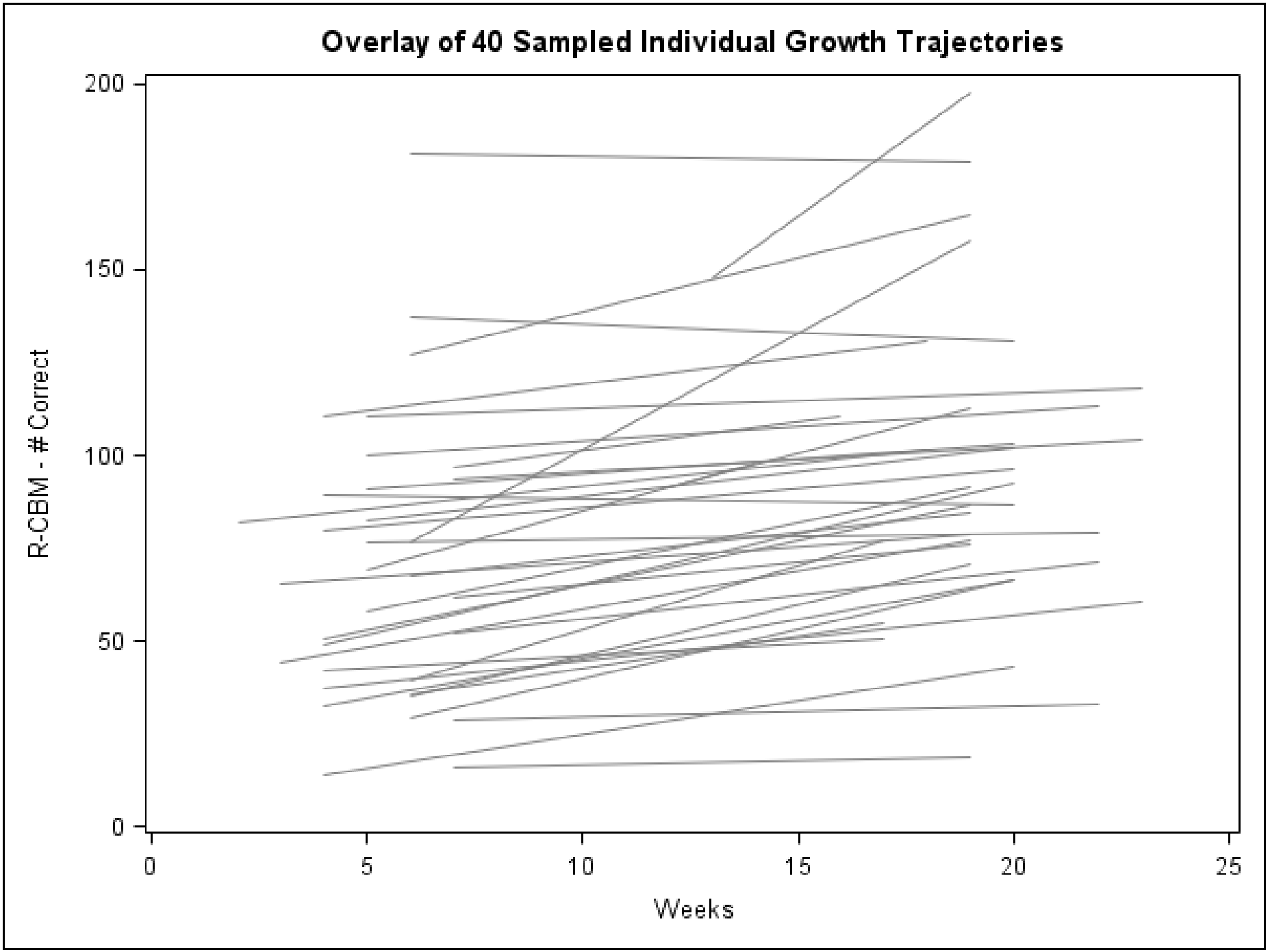
- TIME (π_{1i}) highly significant

Model B: Variance Estimates

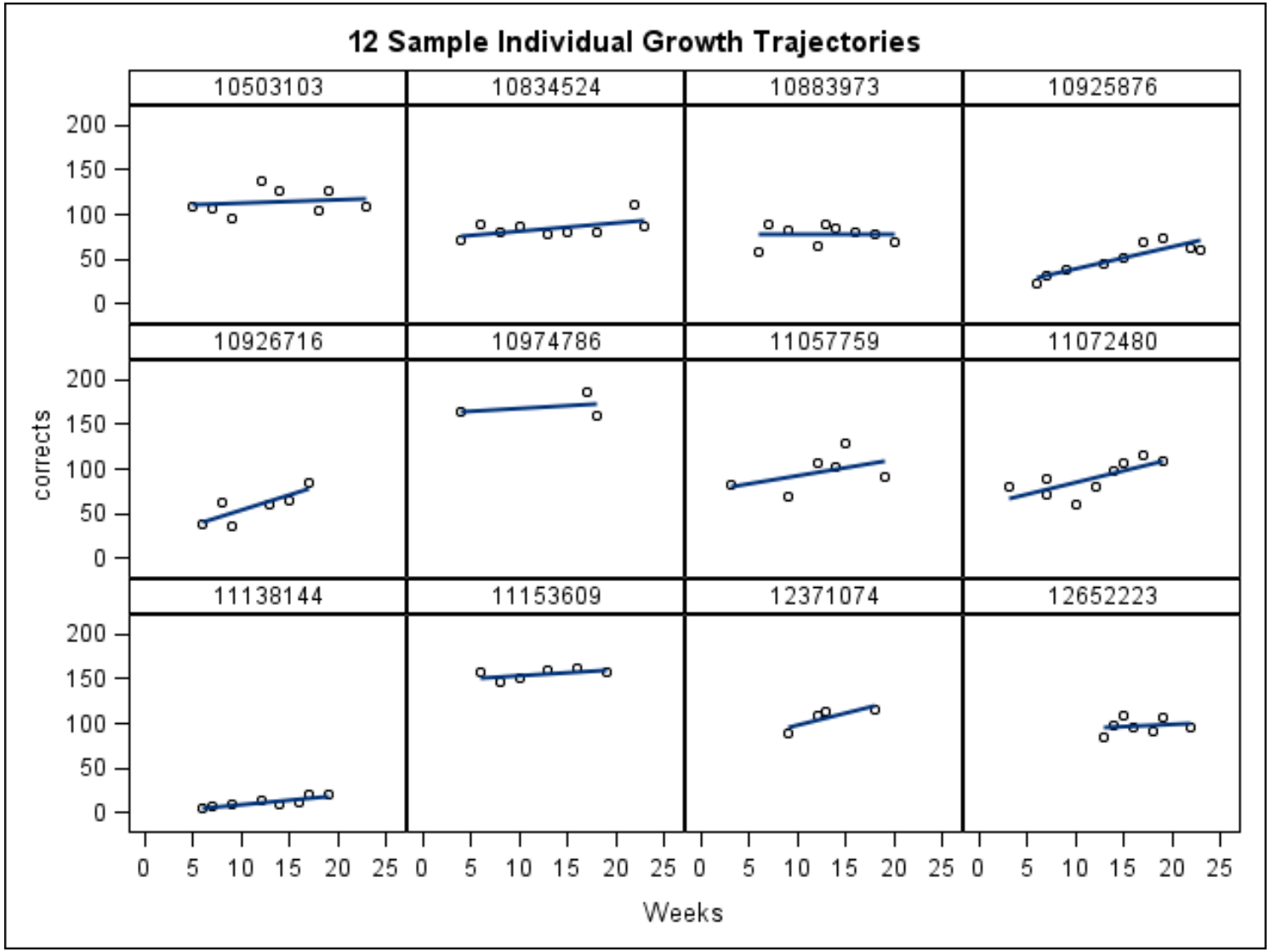
Level 1	Model A	Model B
Within-person	**238.0**	**170.7**
	6.2	4.9
Level 2		
Init Status	**1524.4**	**1553.0**
	97.5	112.5
Rate of Change		**0.4**
		0.1
Covariance		-1.5
		2.6

Growth explains much within-person variance

Growth rate not related to initial status


Overlay of 40 Sampled Individual Growth Trajectories
R-CBM - # Correct
200
150
100
50
0
0
5
10
15
20
25
Weeks

Growth Trajectories



Model C: *AboveGrade* as L-2 Covariate

- *AboveGrade* = Rdg Grade Level – Actual Grade
  - Reading grade level measured once

- Model C: *AboveGrade* may predict both
  - Individuals' initial status (sig.)
  - Individuals' growth rate (not sig.)

Model D: Final Baseline Model

AboveGrade predictor of initial status only

- Level-1 Model

$$Y_{ij} = \pi_{0i} + \pi_{1i} TIME_{ij} + \varepsilon_{ij}$$

- Level-2 Model

$$\pi_{0i} = \gamma_{00} + \gamma_{01} AG_i + \zeta_{0i}$$
$$\pi_{1i} = \gamma_{10} + \zeta_{1i}$$

- Composite Model:

$$Y_{ij} = \gamma_{00} + \gamma_{01} AG_i + \gamma_{10} TIME_{ij} + (\zeta_{0i} + \zeta_{1i} TIME_{ij} + \varepsilon_{ij})$$

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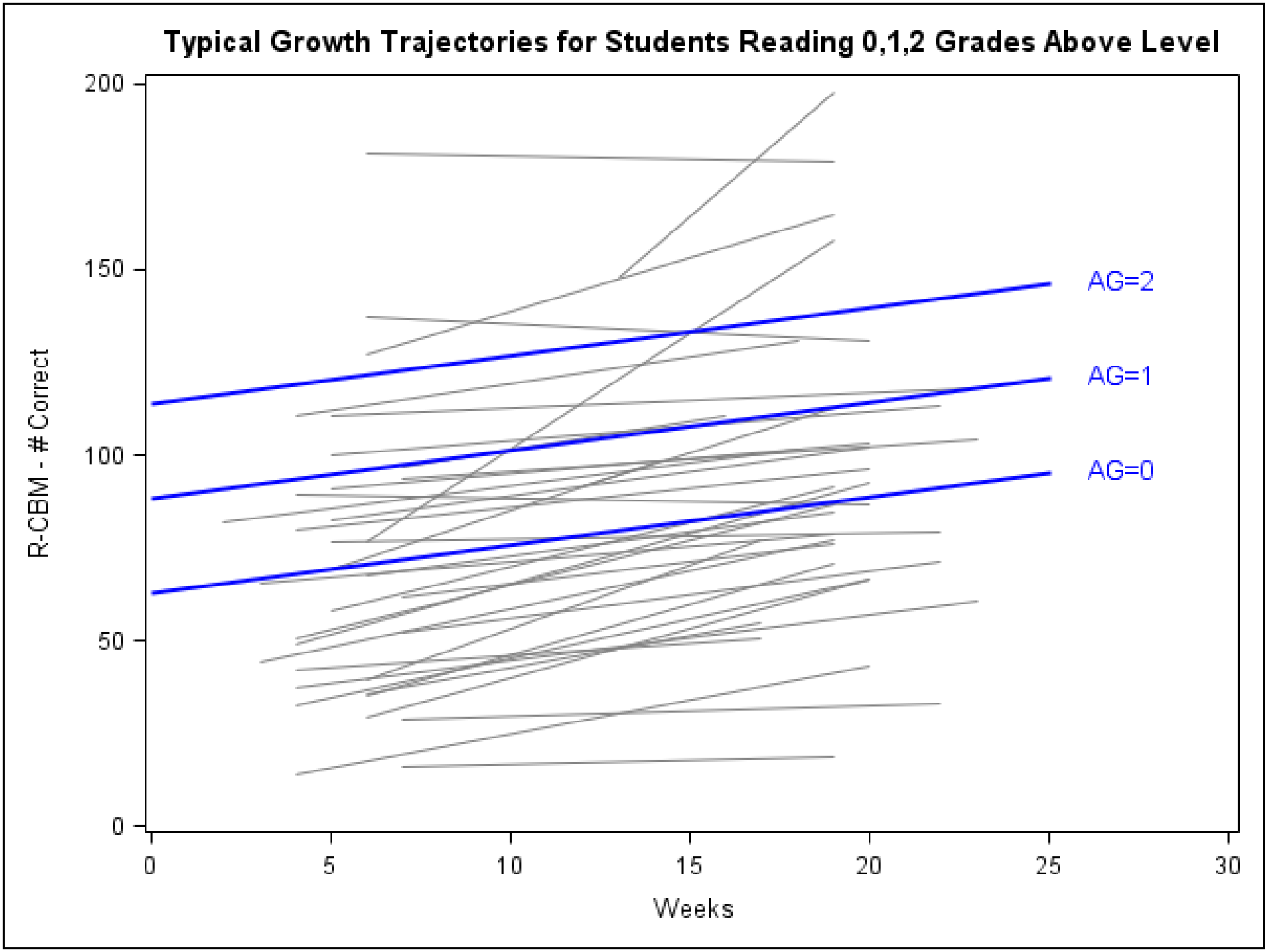
Typical Growth Trajectories for Students Reading 0,1,2 Grades Above Level
R-CBM - # Correct
200
150
100
50
0
0
5
10
15
20
25
30
Weeks
AG=2
AG=1
AG=0

Model E: Effect of UnivAdmin

- Include UnivAdmin as level-1 predictor of elevation (not slope)
- Level-1 Model

$$Y_{ij} = \pi_{0i} + \pi_{1i}TIME_{ij} + \pi_{2i}UA_{ij} + \varepsilon_{ij}$$

- Level-2 Model

$$\pi_{0i} = \gamma_{00} + \gamma_{01}AG_i + \zeta_{0i}$$
$$\pi_{1i} = \gamma_{10} + \zeta_{1i}$$

Primary Interest

Fixed Effects & Std. Errors

		Unconditional		AboveGrade		UnivAdmin	
	Parameter	A	B	C	D	E	F
Initial Status							
Intercept	G00	**80.00**	**62.94**	**63.08**	**63.12**	**63.04**	63.19
		1.71	1.81	1.58	1.57	1.58	1.58
AboveGrade	G01			**25.00**	**25.58**	**25.61**	25.59
				2.14	1.87	1.87	1.87
UnivAdmin	G02					-1.37	-7.34
						0.92	4.69
Rate of Change							
Intercept	G10		**1.38**	**1.30**	**1.29**	**1.31**	1.30
			0.05	0.06	0.06	0.06	0.06
AboveGrade	G11			0.05			
				0.09			
UnivAdmin	G12						0.38
							0.29

Model F: Does UnivAdmin Affect Student Growth Rates?

- Thought unlikely but we checked

- Level-1 Model

$$Y_{ij} = \pi_{0i} + \pi_{1i}TIME_{ij} + \pi_{2i}UA_{ij} + \boldsymbol{\pi_{3i}(TIME_{ij} \times UA_{ij})} + \varepsilon_{ij}$$

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Fixed Effects

		Unconditional		AboveGrade		UnivAdmin	
Parameter		A	B	C	D	E	F
Initial Status							
Intercept	G00	**80.00**	**62.94**	**63.08**	**63.12**	**63.04**	**63.19**
		1.71	1.81	1.58	1.57	1.58	1.58
AboveGrade	G01			**25.00**	**25.58**	**25.61**	**25.59**
				2.14	1.87	1.87	1.87
UnivAdmin	G02					-1.37	-7.34
						0.92	4.69
Rate of Change							
Intercept	G10		**1.38**	**1.30**	**1.29**	**1.31**	**1.30**
			0.05	0.06	0.06	0.06	0.06
AboveGrade	G11			0.05			
				0.09			
UnivAdmin	G12						0.38
							0.29

Primary Outcome

Scores on R-CBM do not appear to depend on whether it is administered by UNC teacher candidates or cooperating teachers.

What Did The Cooperating Teachers Think of the Project?

- Positive aspects of the project
  - More consistent collection of student data
  - Increased instructional time
  - Expanded university/school relationships
- Suggestions for improvement
  - Consistent testing schedules
  - Training with more CBM tools
  - Include time for teacher candidates to get to know elementary school students

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What Did The University Teacher Candidates Think of the Project?

- Positive aspects of the project
  - Practice and exposure to more CBM's
  - Experience administering CBM's in school settings
  - Enhance resume and making connections with future employers
- Suggestions for improvement
  - Opportunity to work in more than 1 school
  - Transparency on time commitment
  - Increase communication to ensure teacher candidate questions are answered prior to testing elementary students

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3 Additional Outcomes Worth Noting

- Cooperating teachers thought this project had positive impact on schools, teacher candidates, and relationship with university
- Teacher candidates thought this project improved their ability to implement CBM's in schools and provided valuable experience
- Teacher candidates were able to implement and score R-CBM with fidelity

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What This Means for Schools and Teacher Preparation

- **School-University partnerships in using CBM's appear to have multiple benefits:**
  - Schools gain resources to gather student-level data
  - Teacher candidates gain valuable experience in high-demand skill area prior to beginning their career
  - School and university build foundation for future partnerships

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Next Steps

1. Study this on a larger scale

2. Broaden the types of CBM tools the students can administer

3. Identify other areas of related need that exist within K-12 schools and teacher preparation programs and develop partnerships to meet those needs

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Thank You!

Questions?

Corey D. Pierce, Ph.D.
Director & Professor
University of Northern Colorado
School of Special Education
Corey.pierce@unco.edu
970-351-1655

Valerie JH Sherman, M.A.
Doctoral Learner
University of Northern Colorado
School of Special Education
Valerie.sherman@unco.edu
970-351-2817

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