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Florida's Value-Added Model

Teacher Leader Preparation Implementation Committee Meeting

Orlando, Florida

November 9 and 10, 2011

Meeting Goals

- Understand the why Florida developed a value-added model for teacher evaluation
- Understand the process by which Florida selected the value-added model
- Understand what is a value-added model
- Understand Florida's value-added model and how the value-added scores are computed
- Understand data available for potential use in teacher leader preparation accountability systems

New Standard for Teacher Evaluations

As set forth in the *Student Success Act* and *Race to the Top*, teacher evaluations are:

- Designed to support effective instruction and student learning growth
- Results used when developing district- and school-level improvement plans
- Results used to identify professional development and other human capital decisions for instructional personnel and school administrators

New Standard for Teacher Evaluations

To support those objectives, the law sets forth that teacher evaluations are to be based on sound educational principles and contemporary research in effective practices in three major areas:

1. The performance of students 
2. Instructional practice
3. Professional and job responsibilities

New Standard for Teacher Evaluations

- Evaluations must differentiate among four levels of performance:
  - Highly effective
  - Effective
  - Needs improvement, or for instructional personnel in first three years of employment, Developing
  - Unsatisfactory
- State Board of Education must establish student growth standards for each performance level (no date required).
- Commissioner must consult with experts, instructional personnel, school administrators, and education stakeholders in developing the criteria for the performance levels.

5

New Standard for Teacher Evaluations

Performance of Students. At least 50% of a performance evaluation must be based upon data and indicators of student learning growth assessed annually and measured by statewide assessments or, for subjects and grade levels not measured by statewide assessments, by district assessments as provided in s. 1008.22(8), F.S.

- Section 1012.34(3)(a)1., Florida Statutes

New Standard for Teacher Evaluations

- The performance of students represents 50% of a teacher's evaluation, with performance based on student learning growth.
- To meet the above requirement, the development of a fair and transparent measure of student growth is essential.

Florida's Value-added Model (VAM) Developed by Florida Educators

- The Department convened a committee of stakeholders (Student Growth Implementation Committee, or SGIC) to identify the type of model and the factors that should be accounted for in Florida's value-added models.
- **The SGIC's recommended model was fully adopted by the Commissioner with no additions, deletions, or changes.**
- To provide technical expertise, the Department contracted with the American Institutes for Research (AIR) to help the SGIC develop the recommended model that was adopted.

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Process

Florida's Value-added Model (VAM) Developed by Florida Educators

- The Student Growth Implementation Committee (SGIC) is composed of 27 members from across the state. The group includes:
  - Teachers (across various subjects and grade levels, including exceptional student education)
  - School administrators
  - District-level administrators (assessment and HR)
  - Postsecondary teacher educators
  - Representative from the business community
  - Parents
- The SGIC met from March through June 2011.
  - Two 2-day in-person meetings
  - Four conference call meetings

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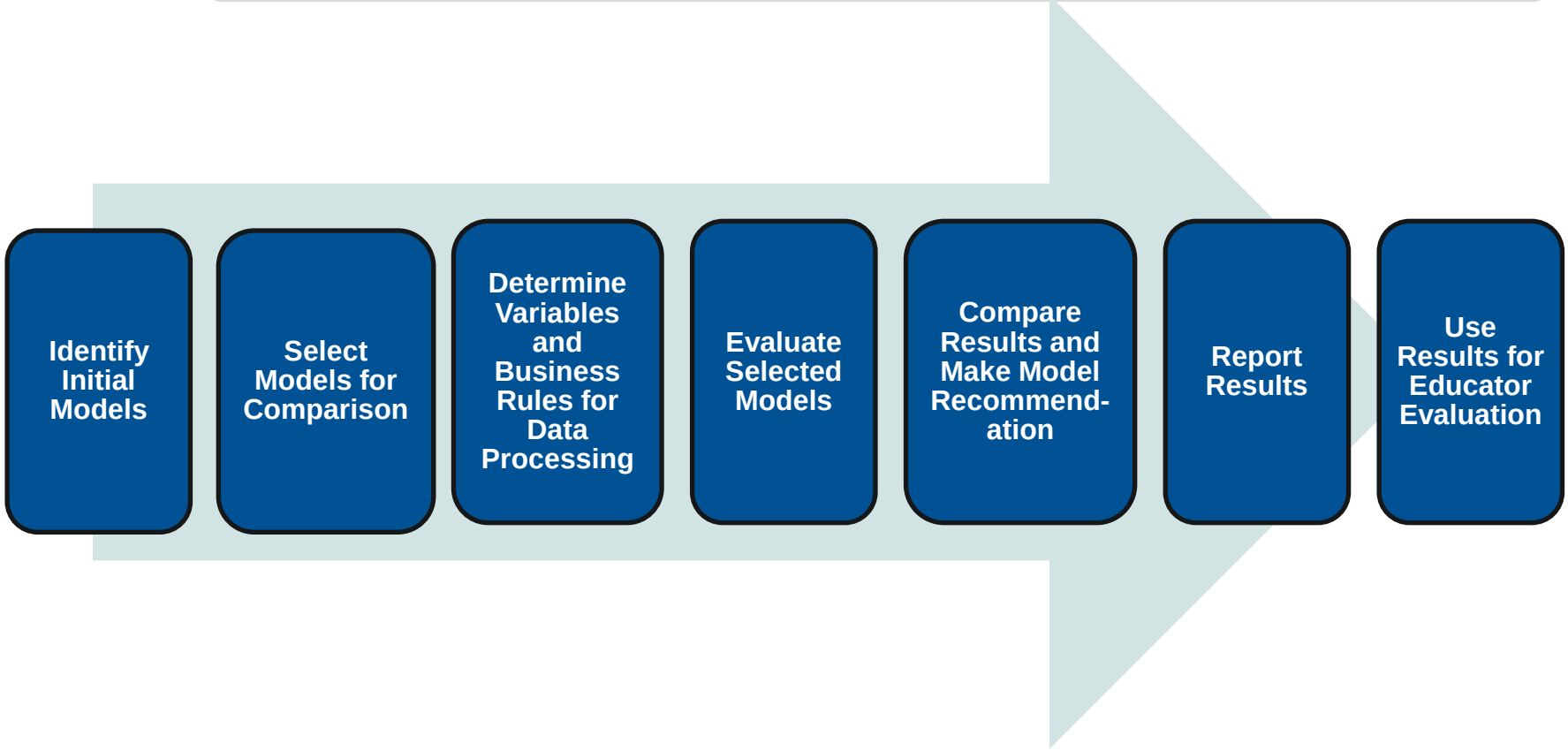
Process

Steps to Developing the Statewide Value-Added Model in Florida



Process

Florida's Value-added Model Developed by Florida Educators

- After exploring eight different types of value-added models, the SGIC recommended a model from the class of *covariate adjustment models.*
- The Commissioner-approved model was developed by the SGIC.
- Model was not pre-selected by the Department or a vendor.
- SGIC process (including the presence of national expertise) allowed for questions, in-depth discussions, and perspectives to be shared from many points of view.
- Nearly all votes of the SGIC were unanimous.

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Objectives

- Discuss value-added models in general
- Describe technical aspects of the Florida FCAT value-added model for reading and math
- Provide summary results of the model

About AIR

- Not-for-profit
- Founded after WWII
- Approximately 1,700 people working in assessment, education, health, and international development
- Statewide assessments in Hawaii, Ohio, Oregon, Delaware, South Carolina, New Mexico, Minnesota
- Value-added modeling for teacher evaluation in Baltimore, Florida, and New York

Florida Model

What are Value-Added Estimates?

- Identify teacher contribution to student learning
- Measure student learning using student-level test scores collected over a period of time
- Level the playing field by accounting for differences in the proficiency and characteristics of students assigned to teachers

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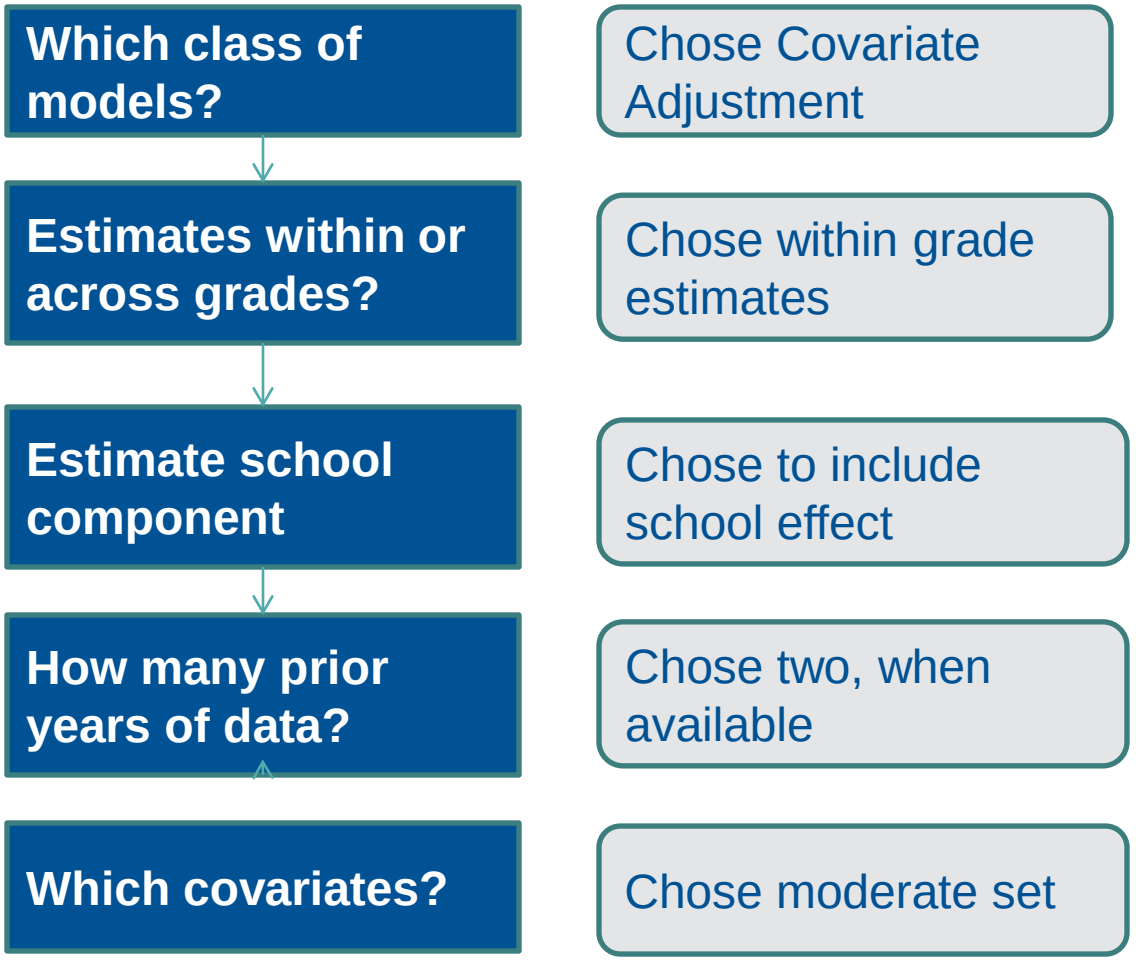
Selecting a Model

- Value-added models, one way or another, control for past performance.
- They may control for other characteristics, which has other implications.
- AIR worked with Florida's Student Growth Implementation Committee (SGIC) to specify the model.

Florida Model

Sequence of Decisions



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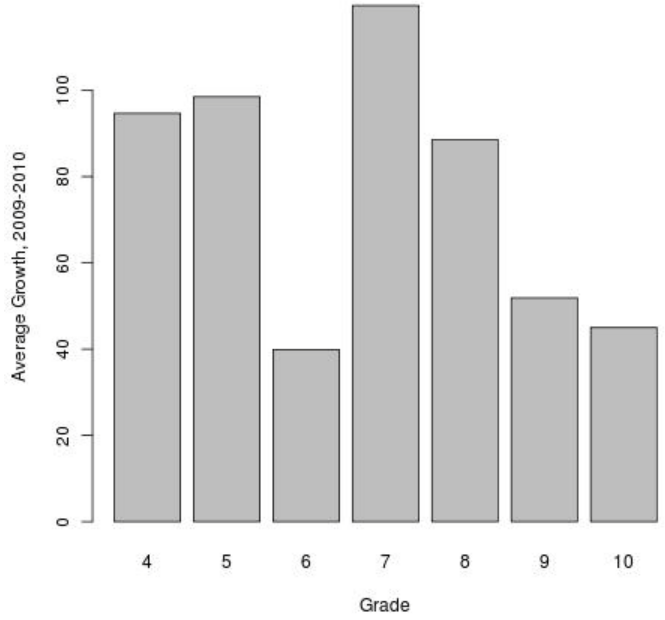
Considerations

- Demands on data
- Precision
- Fairness
- Parsimony

Florida Model

Demands on Data

The graphic shows how gain scores vary between grades in math:



We observe much larger gains in the lower grades than we do in grades 8, 9, and 10. **Why is this**?

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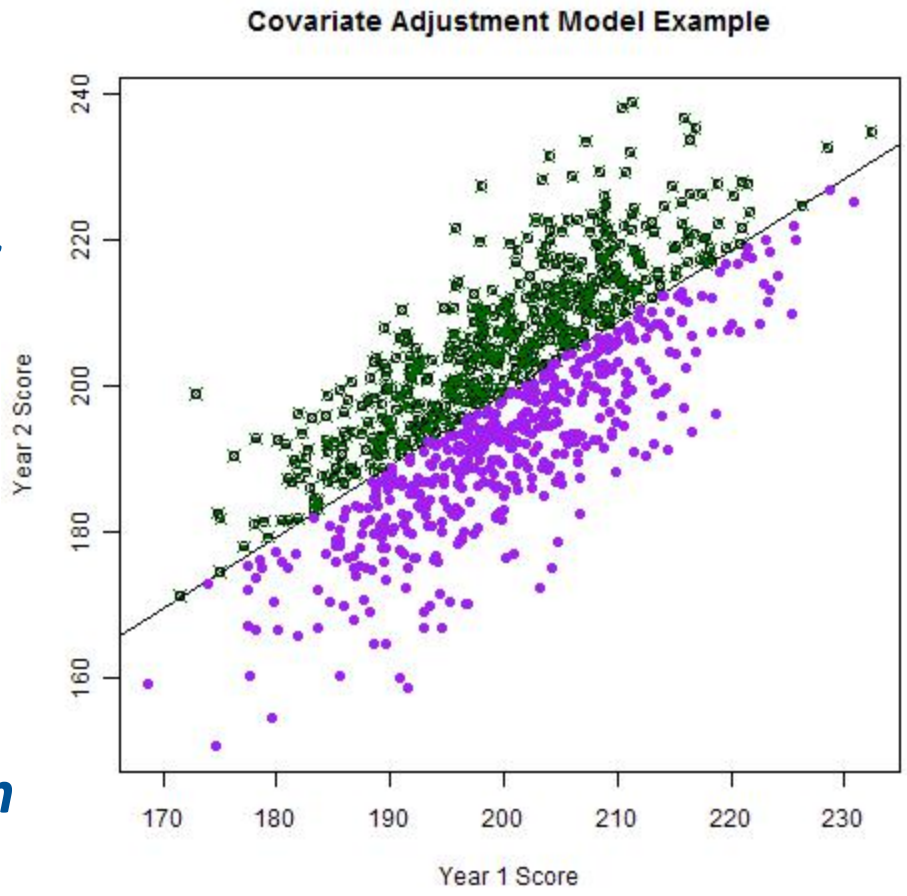
Demands on Data

- Some models make more demands on the data (or require stronger assumptions).
- The committee was not comfortable assuming that the units of measure mean the same thing across grades.
- Treated grades separately, and ruled out the use of some longitudinal mixed models.

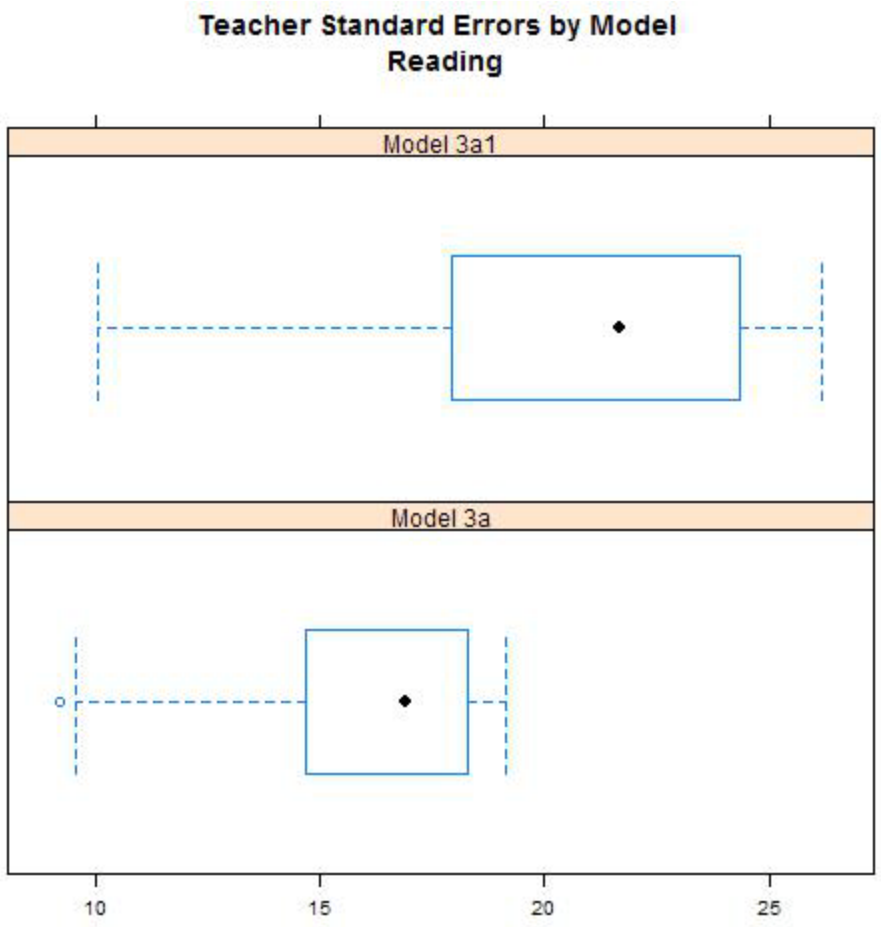
Selected Covariate Adjustment Model

These models expect students who score the same as one another in prior years to score the same the next year. For any given student, the expected score may exceed or fall below the average score by varying amounts each year.



Florida Model

More Prior Achievement Data Improve Reading Estimates



Adding an extra year of prior achievement yields more precise estimates.

This model includes only one year prior achievement and nothing else.

This is the same model with two years' prior achievement.

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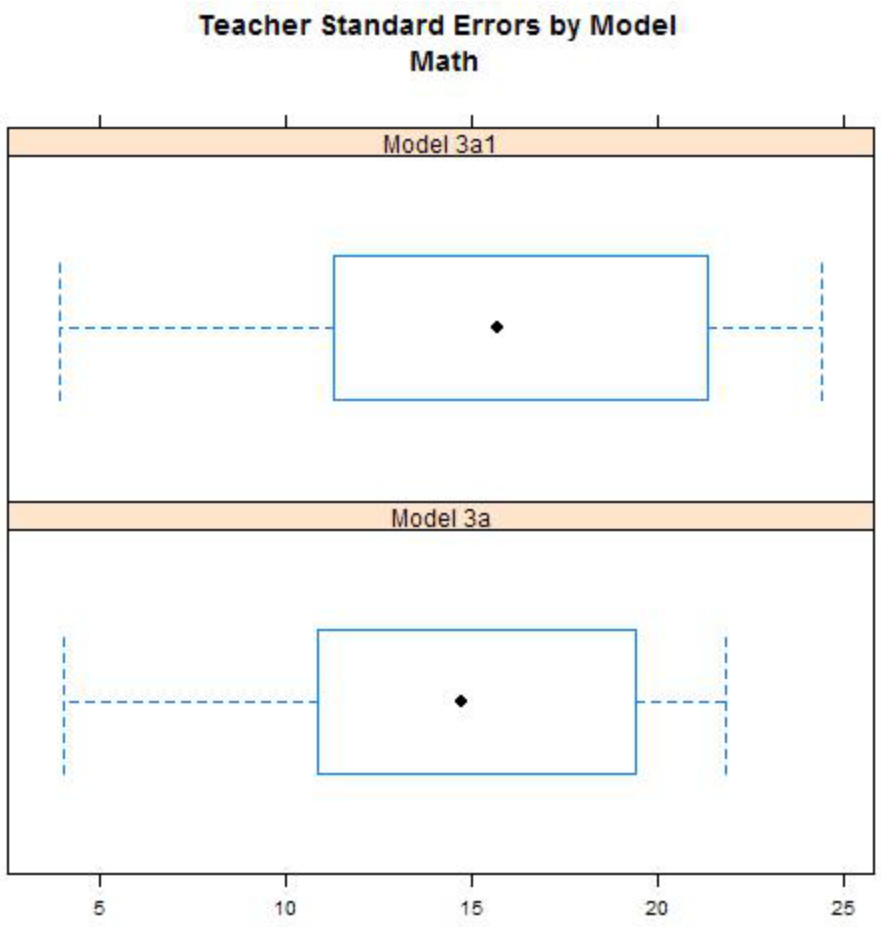
Florida Model

More Prior Achievement Data Improve Math Estimates



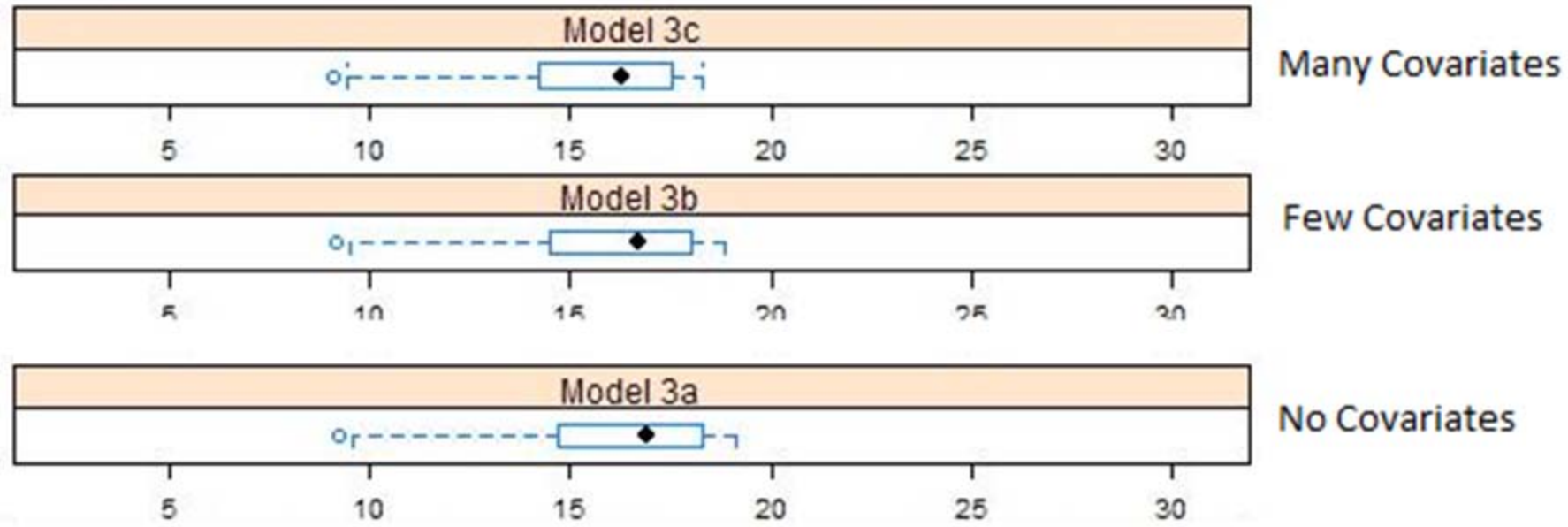
We see the same pattern in math

This model includes only one year prior achievement and nothing else.

This is the same model with two years' prior achievement.

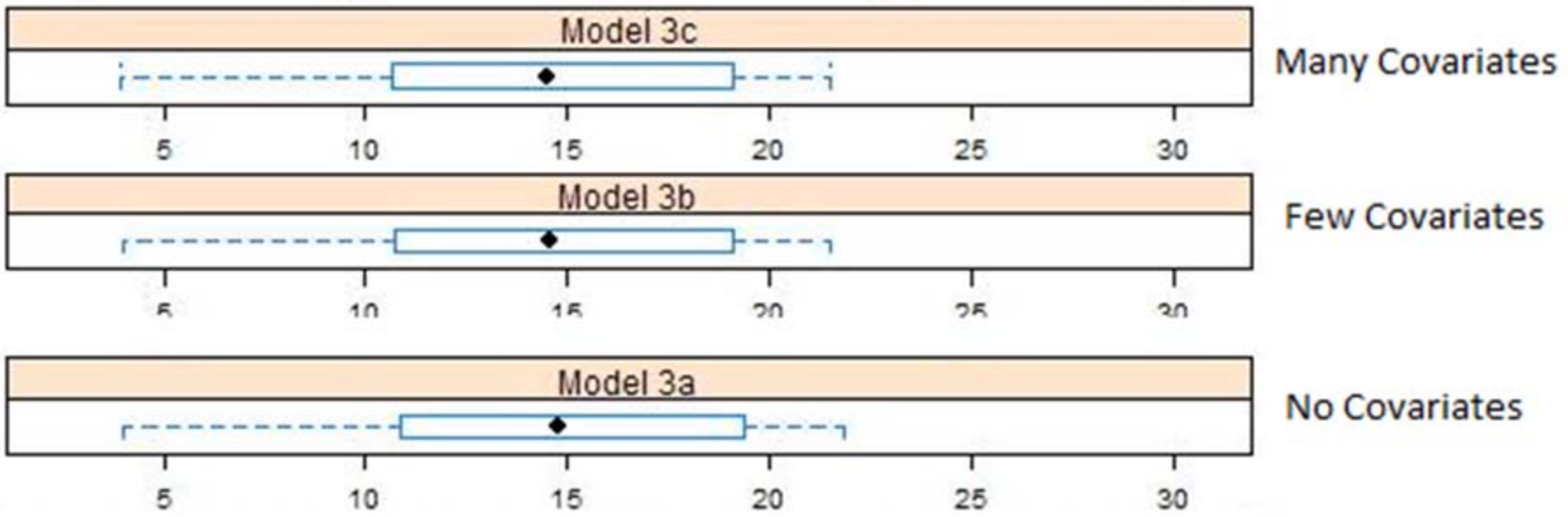
Florida Model

Effect of Additional Covariates on Precision: Reading



Florida Model

Effect of Additional Covariates on Precision: Math



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Pause for Summary

- Covariate adjustment model.
- Adding an additional year of achievement provides some small improvement in precision.
- Adding additional covariates, few or many, had little impact on precision.

Florida Model

Selected Covariates (many) Identified by the SGIC to 'Level the Playing Field'

Student Characteristics:

- Up to two prior years of achievement scores (the strongest predictor of student growth)
- The number of subject-relevant courses in which the student is enrolled
- Students with Disabilities (SWD) status
- English Language Learner (ELL) status
- Gifted status
- Attendance
- Mobility (number of transitions)
- Difference from modal age in grade (as an indicator of retention)

Classroom characteristics:

- Class size
- Homogeneity of students' entering test scores in the class

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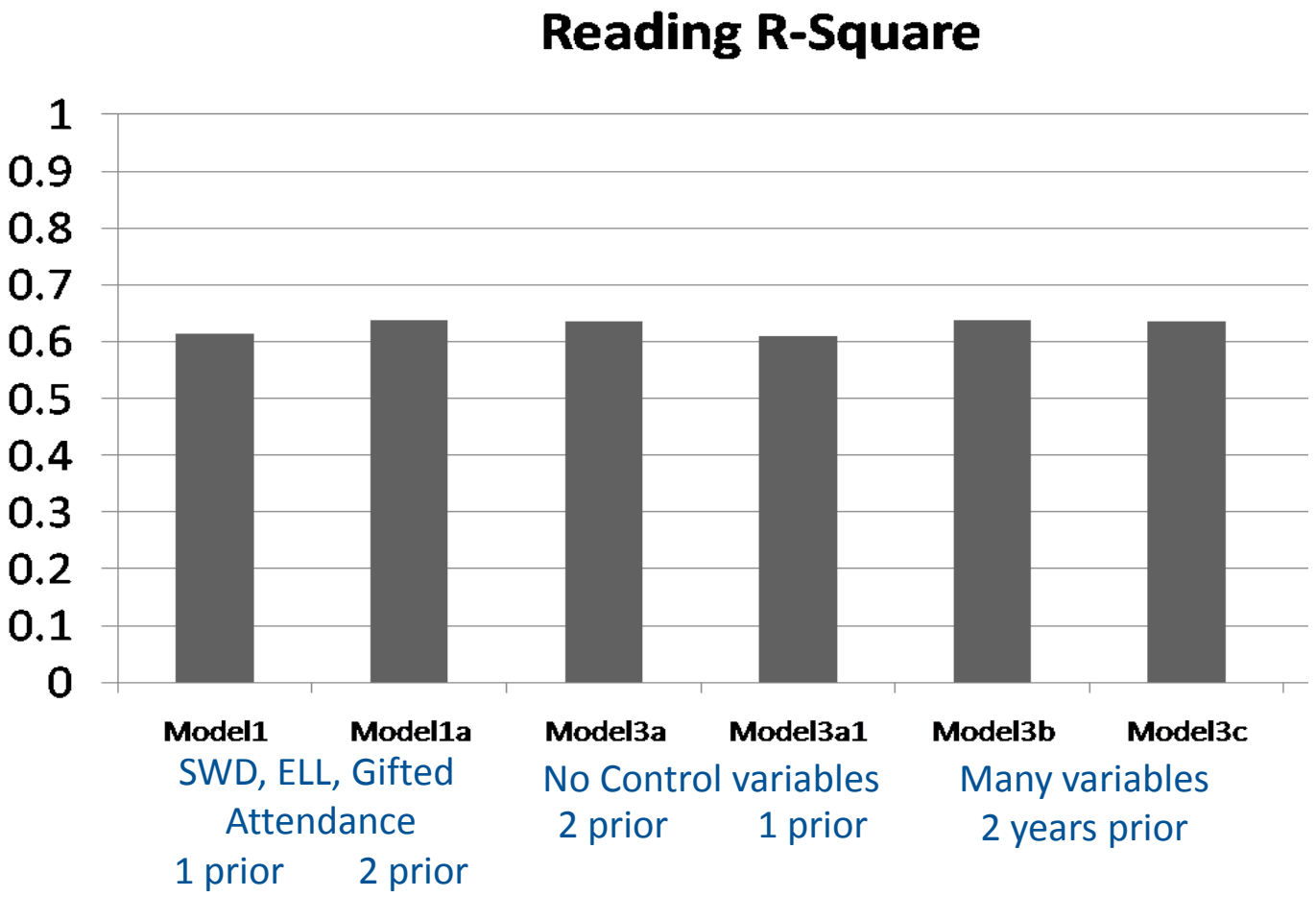
Florida Model

Proportion of Variance in Current Year Test Score Explained by Control Variables: Reading

More control variables improve model fit.

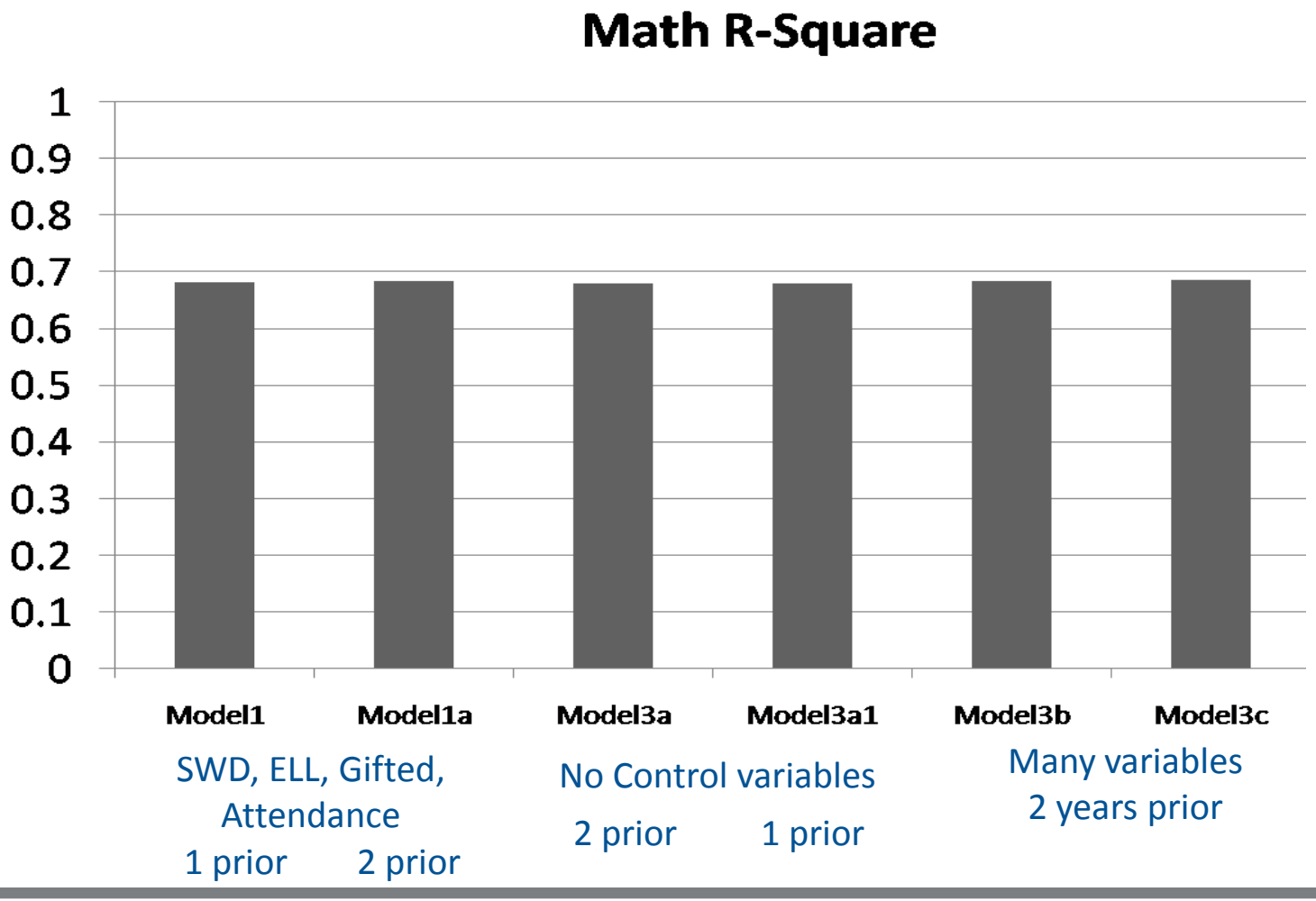
An additional prior year gives a moderate difference; other variables matter less.



Florida Model

Proportion of Variance in Current Year Test Score Explained by Control Variables: Math

We see a similar pattern in math.



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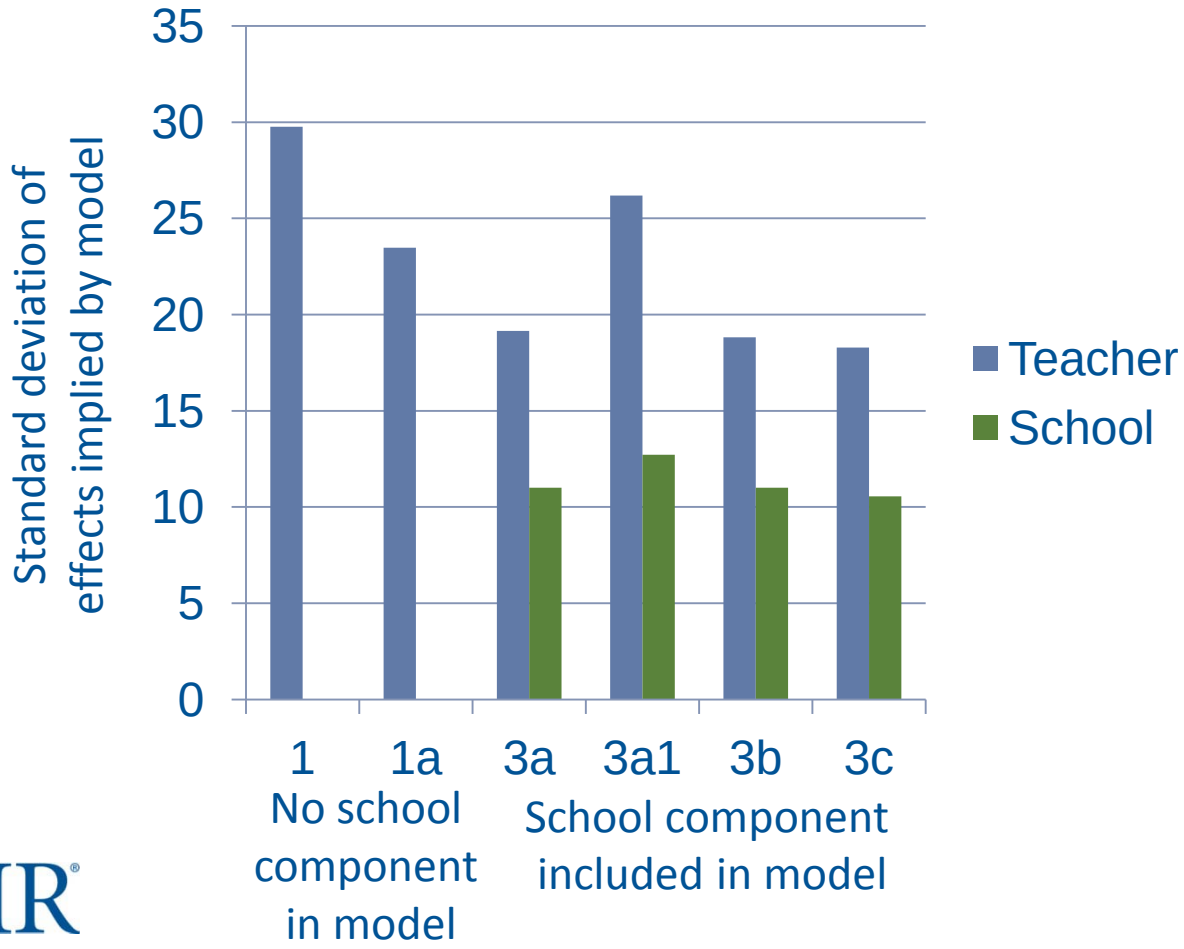
School and Teacher Components

- Are there school-level influences on student learning that are beyond the control of the teacher?
  - The answer may not be known, but the issue was addressed specifically.
- We estimated some of the models to decompose the variance into school and teacher components.
  - These results enables the committee to consider the question explicitly.
  - Neglecting the school component in the model provides an implicit answer to the question: schools do not influence student learning; teachers do.

Florida Model

Variances Between Teacher and School Reading



An estimable school component exists. Models 1 and 1a implicitly assign these effects to teachers. This choice should be explicit.

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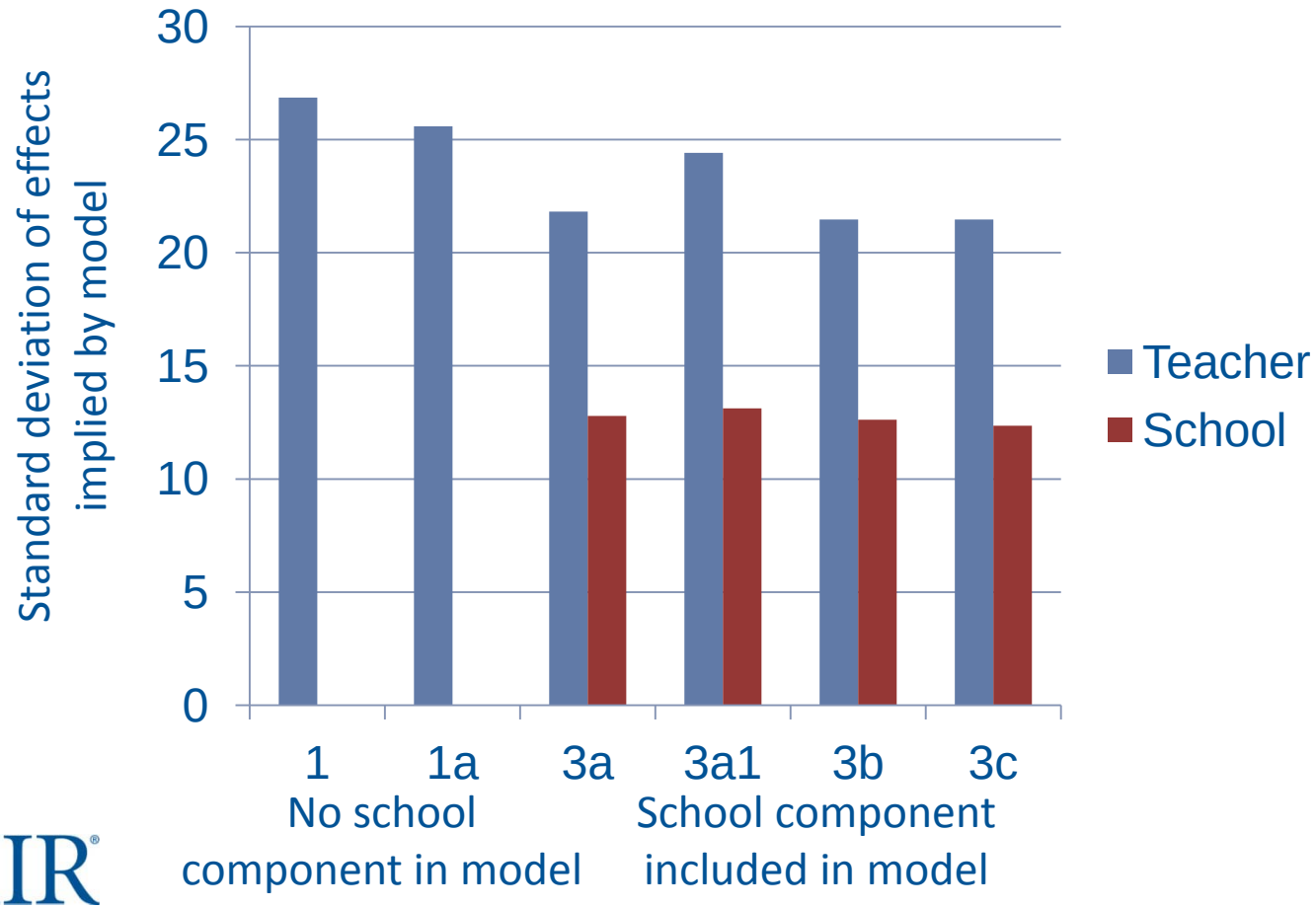
Variances Between Teacher and School Math



We see the same pattern in math.

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Student Learning Varies by Both Teacher and School

- At least two possibilities:
  - Real effects stem from the teacher, but better teachers tend to be clustered in some schools and worse teachers in others.
  - Other things happening at the school have some independent effect.
- The data do not distinguish between these possibilities.
- The committee chose to keep the school component in the model (more on this later).

Florida Model

Does the school have an independent effect?

- Some evidence exists that some curricula are better than others, at least for certain populations.
- Principals can allocate resources, such as paraprofessionals, resource teachers, safety staff, etc.

School Component

We know two things about the school component: It is not 100 percent attributable to teachers and it is not 0 percent attributable to teachers.

Lance Tomei—Director for Assessment, Accreditation and Data Management, University of Central Florida College of Education, SGIC committee member

School Component

- The committee deliberated for a long time and decided to attribute 50% of the school component to teachers.
- Fifty percent was viewed as a decent approximation to their real-world belief that principals and schools have some influence independent of teachers, but that teacher quality is also clustered by school.

The Value-Added Score

Teacher Value-Added Score

=

Unique Teacher Component

+

(½) * Common School Component

Florida Model

Precision, One Grade, One Year

Precision of estimates
(example—grade 7 Math, 2010–11)

$$\frac{\text{Average standard error of estimate}}{\text{Standard deviation}} = 1$$

Things get better if you aggregate across years, legislation says three years.

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Challenge to Aggregation

- All tests on the FCAT Developmental Scale.
- Earlier, we showed that that scale varies a lot across grades, and some across years.
- **Challenge:** If we do not accept that the units are the same across grades, how do we aggregate?
- **No official Decision.** One way is to turn this into an “average years of growth” metric.

Transform to an Average Year's Growth Metric

$$\text{Added Years of Growth} = \frac{\text{Value - Added Score}}{\text{Average Year's Growth}}$$

OR

$$\text{Added Months of Growth} = \frac{\text{Value - Added Score}}{12 * \text{Average Year's Growth}}$$

Florida Model

Precision: Aggregated Over Three Years

Precision of estimates for

Grade 7 Math teachers

$$\frac{\text{Average standard error of estimate}}{\text{Standard deviation}} = 0.63$$

Summary

- Covariate adjustment model with two years of data when available.
- Control for a moderate list of student and school/class variables.
- Estimate school and teacher component, attributing ½ of school component to teacher.
- Estimates achieve a useful level of precision when they are aggregated, but require a common aggregation metric.

Student growth materials

Information about the activities, membership, meeting schedule and materials, recording of conference calls and webinar of the SGIC, and this technical assistance meeting are posted at: http://www.fldoe.org/committees/sg.asp.

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