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Measuring educational performance for improvement:
A framework for diagnostic use of data

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Agenda

- Welcome and introduction
- Present a framework for diagnostic use of data to measure educational performance for improvement
- Panel discussion
- Questions and answers

How can we make data *useful* to educators and policymakers for improvement?

- Policymakers and educators are implored to be “data-driven” and “evidence-based”
- But data often aren’t actionable
- Helping educators and policymakers make sense of data and use it for improvement is a major focus of the Regional Educational Laboratories (RELs)
- In the wake of pandemic-related disruptions, measures that are rich, broad, and actionable may be even more important
- Many districts are drowning in data from learning management systems at the same time that states are flying blind due to assessment disruptions

Beware the descent into Taylorism: Using measures for performance management can go wrong in various ways

- Incompleteness of measures
- Distorting effects of high stakes (Campbell's Law)
- Overinterpretation of measures that aren't reliable (fooled by randomness)
- Misattribution (misinterpreting cause of an outcome)
- Disconnect between outcome measures and processes producing them ("black box" problem)

How do we avoid these pitfalls and ensure that data are diagnostic and actionable?

The framework: Measurement to manage performance requires distinct kinds of data for distinct diagnostic purposes

1. Student outcomes: How are the kids doing (in the short and long term)?
   - Diagnostic for identifying needs of students (and collectively, needs of schools)
2. Impact on outcomes: How much does the school contribute to how kids are doing?
   - Diagnostic for identifying underperforming (and overperforming) schools
3. Processes related to outcomes: What is happening in the school (or classroom)?
   - Diagnostic for identifying possible processes for intervention
   - Potentially diagnostic for identifying underperforming (and overperforming) schools

1: Student outcomes

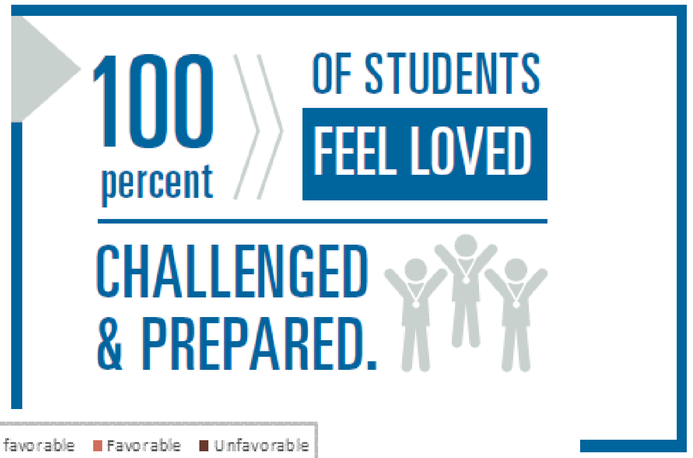
How are the kids doing?

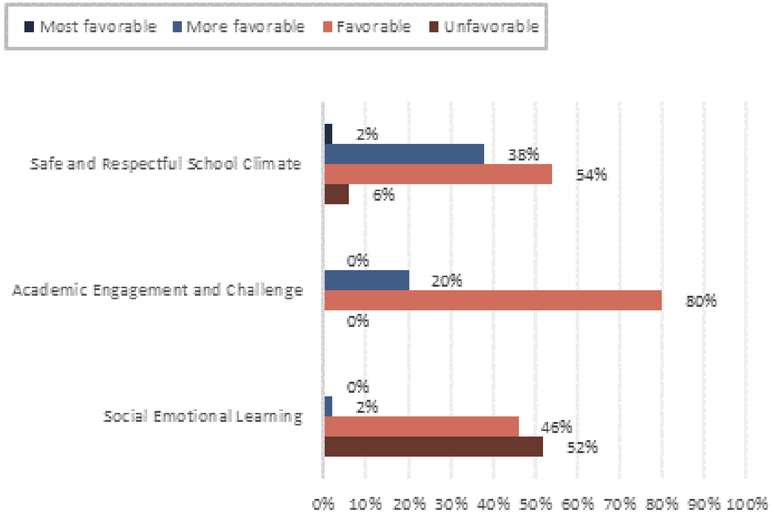
We need broader and richer measures of student outcomes

- Strongest critique of high-stakes testing is that tests don’t measure everything we want kids to learn
- ESSA has expanded measures beyond test scores to include graduation, chronic absenteeism, college readiness, and other measures of success
- Other possibilities include:
  - Postsecondary enrollment, persistence, degree completion
  - Workforce participation in adulthood
  - Social-emotional learning
  - Citizenship, including registration and voting

REL Mid-Atlantic assessed social-emotional learning in PA and DC

- DC Public Schools: Analyzed student survey data to create index of whether students are “loved, challenged, and prepared” (Kautz et al. 2021)
  - Not used for formal accountability, but districtwide measure is publicly reported
- Pennsylvania: Analyzed student and staff survey data to create school climate index (Amos & Xue 2021)
  - Not used for formal accountability: Schools opt into survey participation

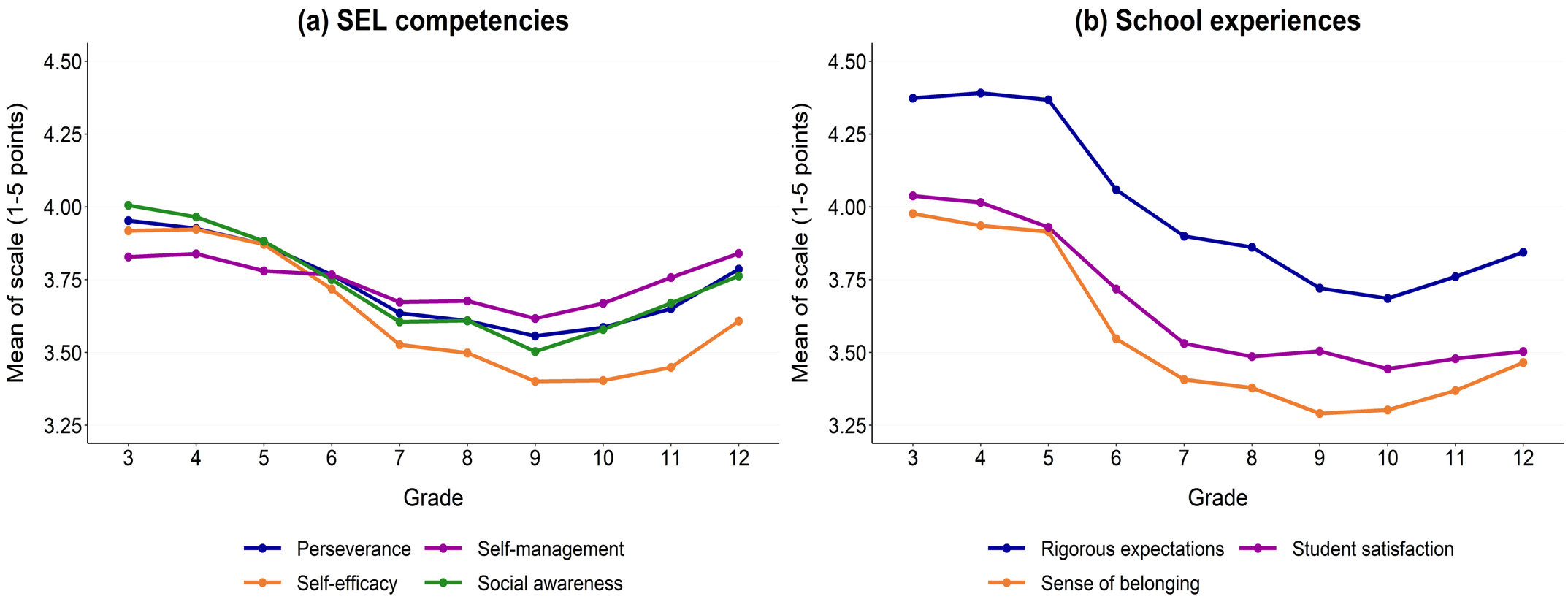




Surveys can produce useful SEL information at the school level

- It is possible to get good response rates from students (and staff)
- Schoolwide SEL measures show good psychometric characteristics
- SEL varies systematically at the school level
  - There is more variation within schools than between schools, but between-school variation is meaningful
- Some caution in interpretation may be needed, e.g. for grade-level differences

DCPS: SEL competencies highest in elementary school and lowest in middle school and early high school



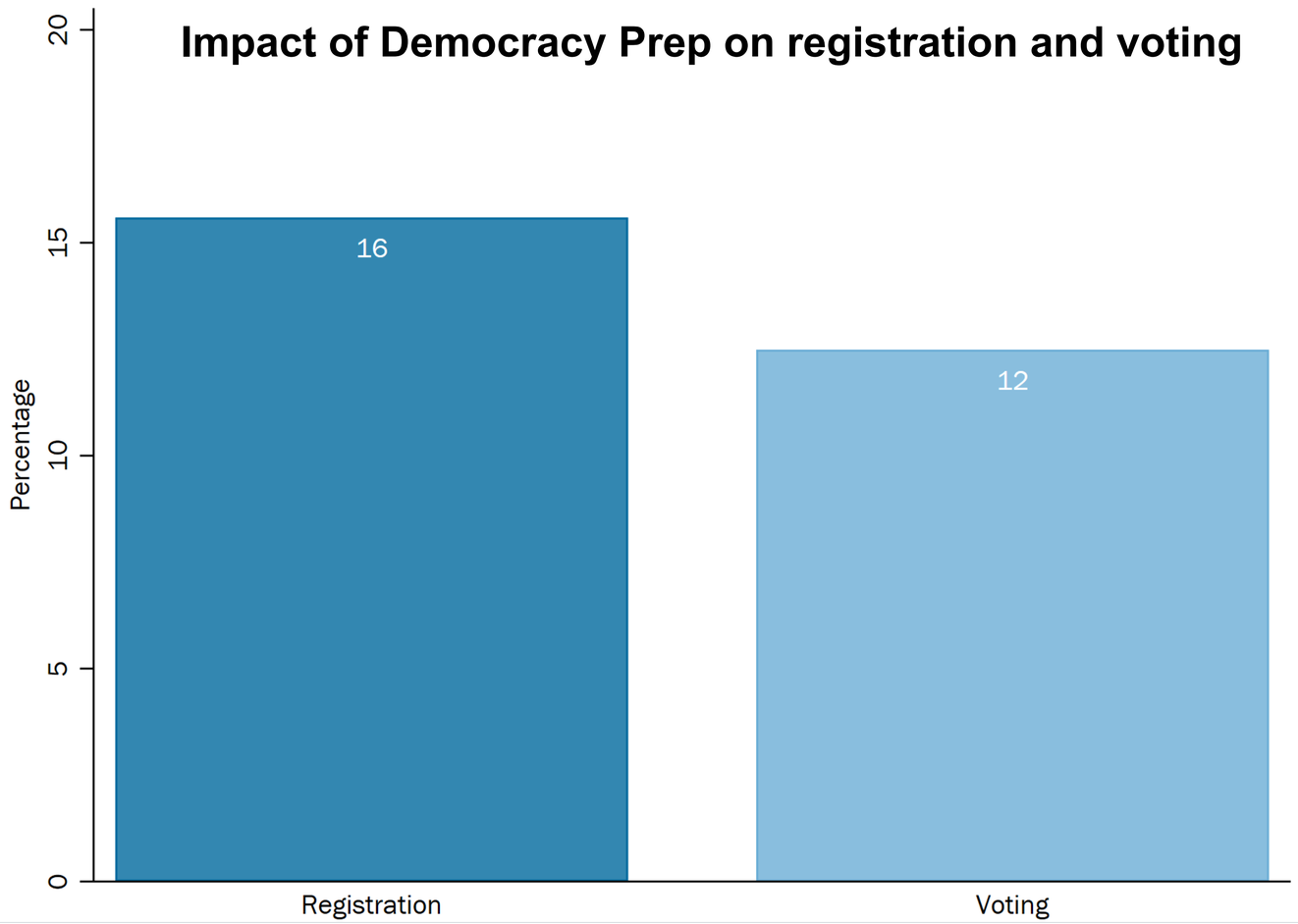
Kautz et al 2021

Civics: Preparation for citizenship is foundation of public education

- Horace Mann, 1855: A well-functioning democracy requires an educated citizenry
  - "Education must be universal . . . The qualification of voters is as important as the qualification of governors, and even comes first, in the natural order . . . The theory of our government is … that every person… shall become fit to be a voter. Education must bring the practice as nearly as possible to the theory."

- Civic purpose of education remains relevant today

Schools can have large impacts on registration and voting



Gill et al 2020

2: Impacts on student outcomes

How much does the school contribute to how kids are doing?

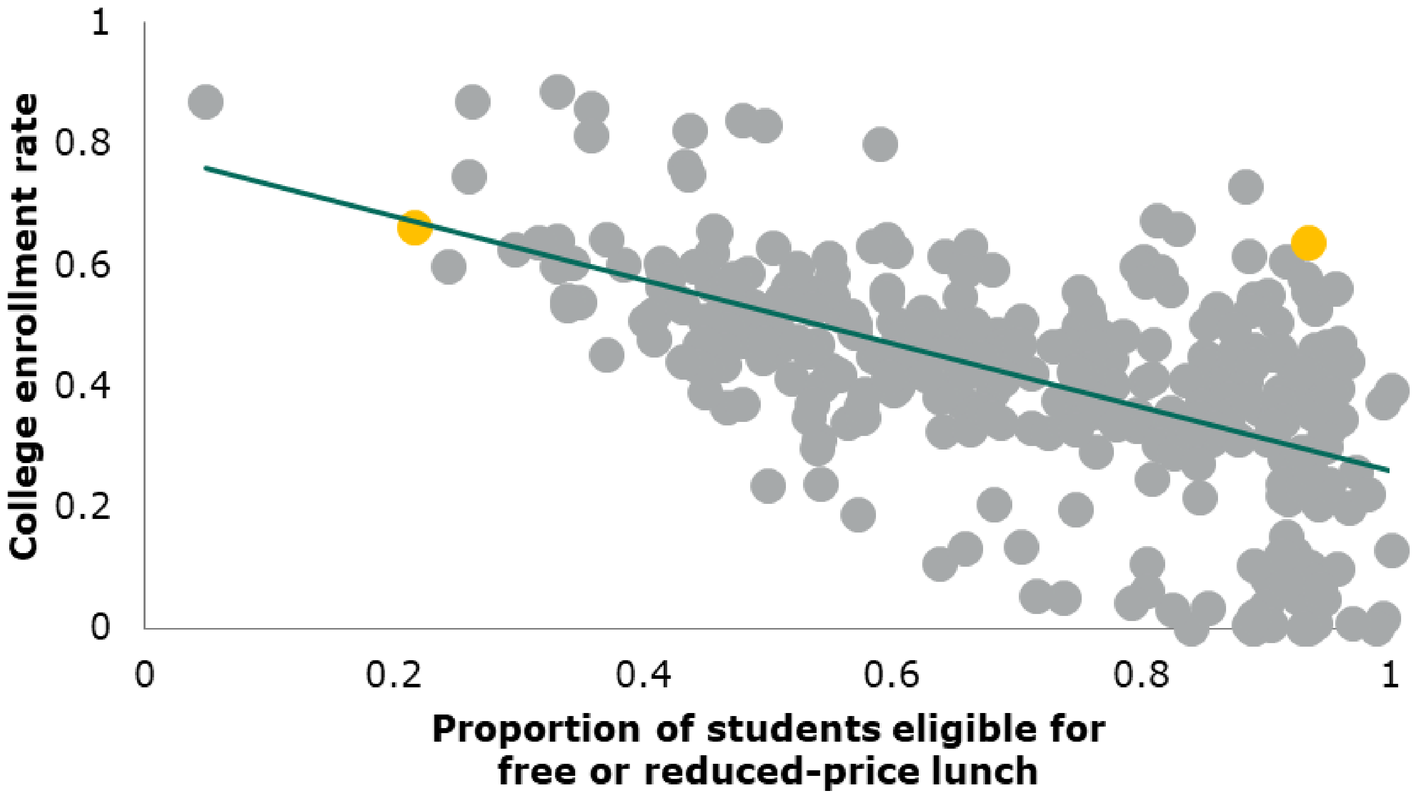
Impacts must be distinguished from raw outcomes

- NCLB critics recognized raw proficiency results conflated school performance/student characteristics
  - Critiques prompted development of value-added and student growth measures
- Expanding outcomes included in accountability systems risks re-creating NCLB's flaw in failing to distinguish school's contribution
  - Why not apply statistical techniques to identify school impacts on SEL, graduation, college enrollment?
- Accountability arguments about relative weight of outcomes vs impacts (status vs growth) miss the point: Outcomes and impacts are diagnostic for *different purposes*
  - Low-status/high-growth school could end up with same overall rating as high-status/low-growth school, but they need very different interventions

Promotion power measures separate schools' contributions from other factors for non-test outcomes

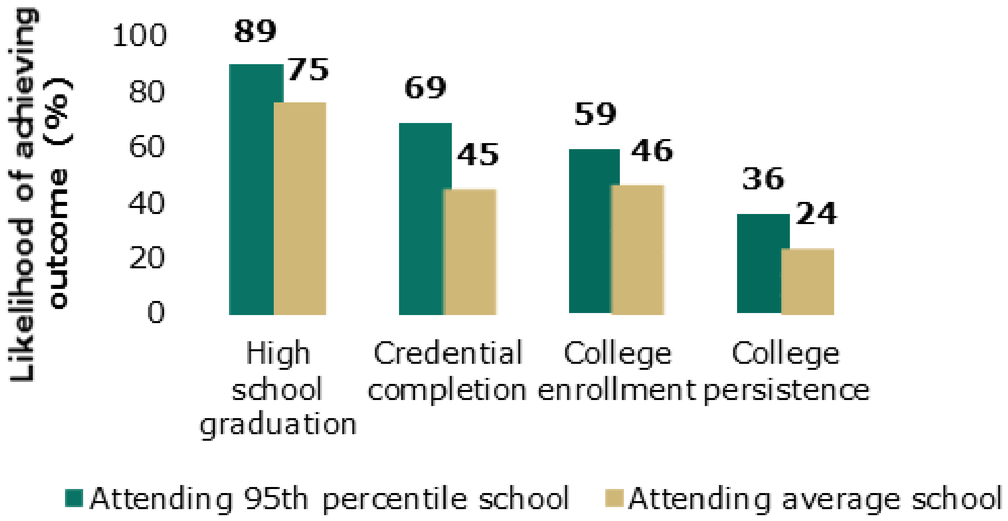
- Use statistical methods similar to those in value-added/growth models (Deutsch et al. 2020; Gross et al 2021)
- Account for differences in advantages and disadvantages of students served
  - Poverty, prior achievement, IEP and ELL status, anything relevant and measured prior to high-school entry
- Aims to be fair to schools and provide better diagnostic info to districts and states
- Under development in partnerships with state education agencies in Louisiana and DC

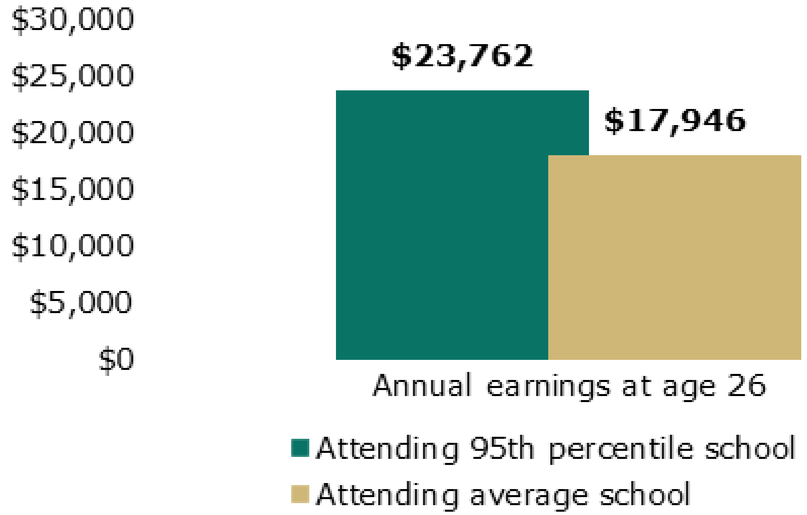
High schools can have the same student outcomes with very different promotion power



Deutsch et al 2020

Attending a high school with high promotion power can substantially improve a student's long-term success





Deutsch et al 2020

3: Educational processes

What is happening in the school?

Process measures can help identify areas for possible intervention

- Even if an impact measure provides a valid and reliable measure of performance, it is a black box: doesn't tell us how or why
- Process measures and mechanisms might include;
  - Observations of instructional practice
  - Climate surveys
  - Student participation indicators from learning management system
  - School inspections
  - Exclusionary discipline
  - Class size, teacher qualifications & experience

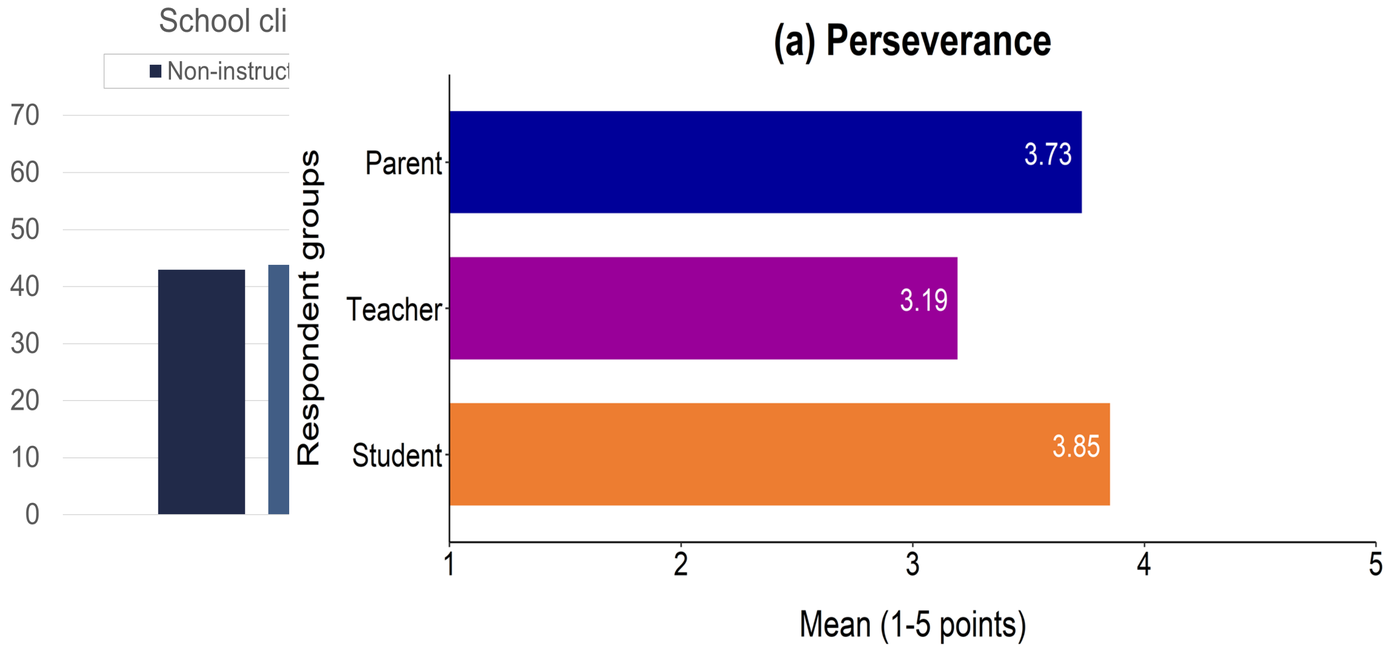
Process measures might compensate for weaknesses of outcome and impact measures

- Outcome/impact measures, even if valid & reliable, are thin/incomplete
  - But we can recognize good schools and good teaching from observation
  - Evidence indicates that even students can recognize good teaching (Raudenbush & Jean 2015; Chaplin et al 2014)

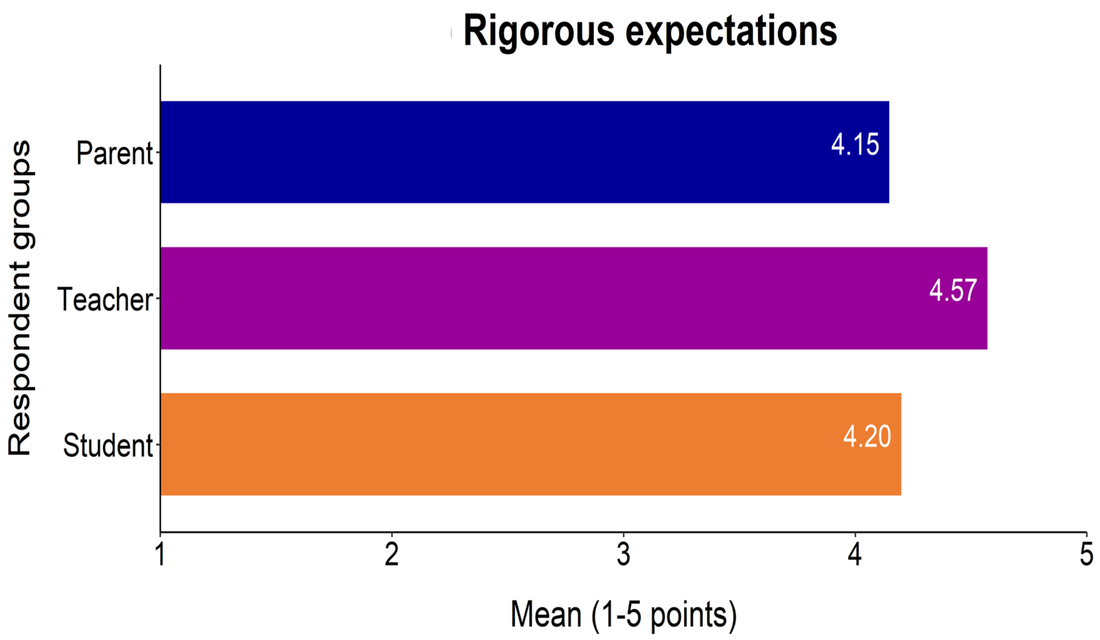
- Some impacts may be impossible to measure
  - We can probably produce acceptably valid and reliable estimates of the value-added of teachers and schools, but…
  - Nobody knows how to measure the impact of an individual principal on student outcomes (Chiang, McCullough, Lipscomb, Gill 2016)

School climate: Student and staff ratings are correlated but also differ systematically

Pennsvlvania

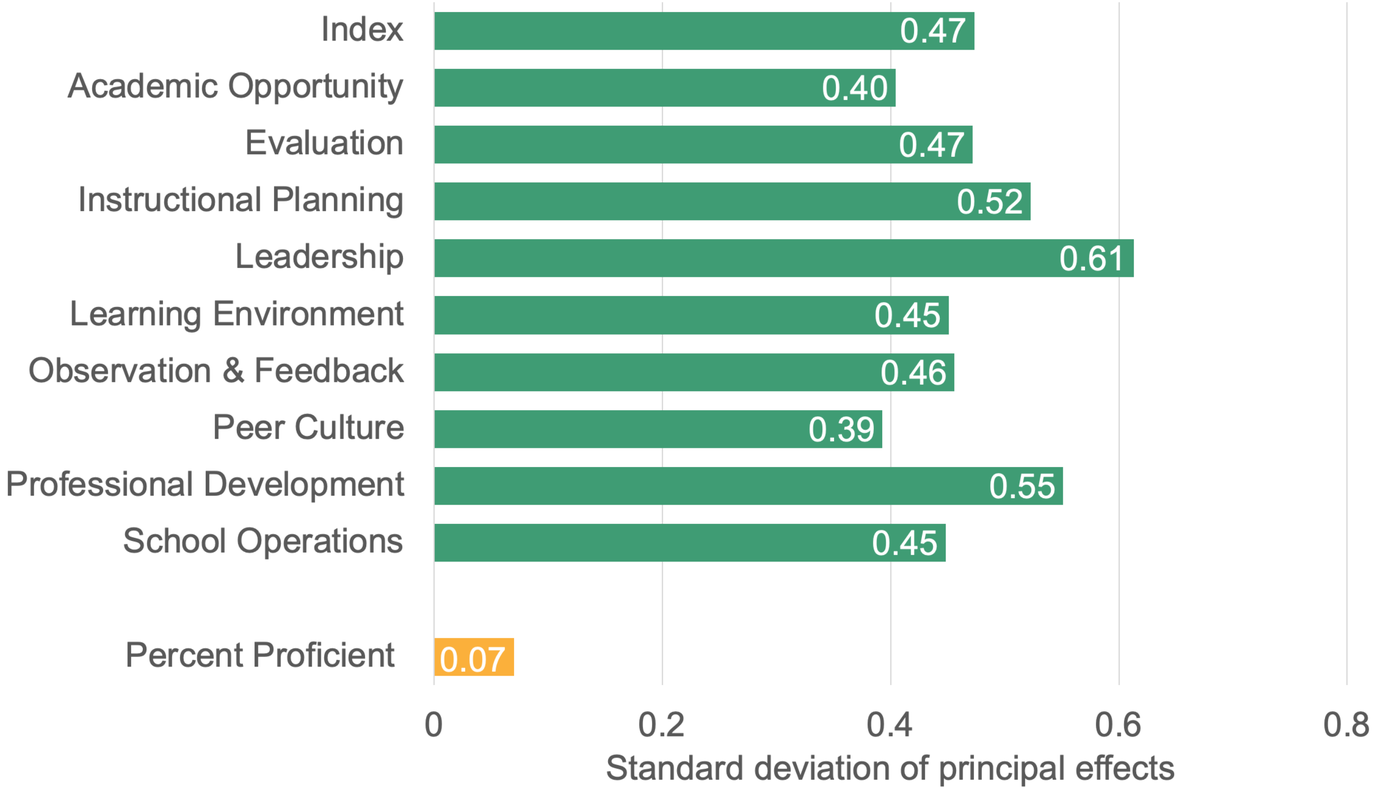


DCPS



Kautz et al 2021

School climate changes substantially with a new principal



Kozakowski, Gill, Shiferaw 2021

Some possible implications for policy and practice

1: Broaden discussion of performance beyond student outcomes and formal consequences

- Accountability can be created without high stakes (Gill, Lerner, and Meosky 2016)
  - Information alone can motivate
  - Campbell's Law is real, and some measures are more corruptible than others
  - Lower stakes may lower the temperature
  - Transparency can create accountability
- Outcomes are not the only measures that matter

2: Recognize the limits of data and measurement

- Good measures can identify:
  - Student and school needs (how are the students doing?)
  - Underperforming schools (what is the school contributing?)
  - Broken processes (what is happening in the school?)
- But measurement alone can’t tell an educator or administrator what to do
- Actions to improve must be informed by expert knowledge from the field

Panel discussion and Q&A

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