

Commissioner's Performance- Based Accountability Task Force: Indicators and Growth



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CENTER FOR ASSESSMENT

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Growth, Improvement, & Status

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- Before discussing the indicators and student growth percentiles, we want to quickly review three common approaches for calculating indicator values
- This will be related to your homework...so yes, there will be a quiz!

Growth, Improvement, & Status

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- **Status** = A point-in-time measurement, e.g., *72% of the students are proficient in math*
- **Improvement** = Is generally the change in status measures when students are NOT matched, e.g., *5% more students are proficient this year compared to last year*
- **Growth** = Is based on determining changes over time based on following the **same students**, e.g., *our 5th grade students grew at a rate of X compared to where they were in 4th grade.*

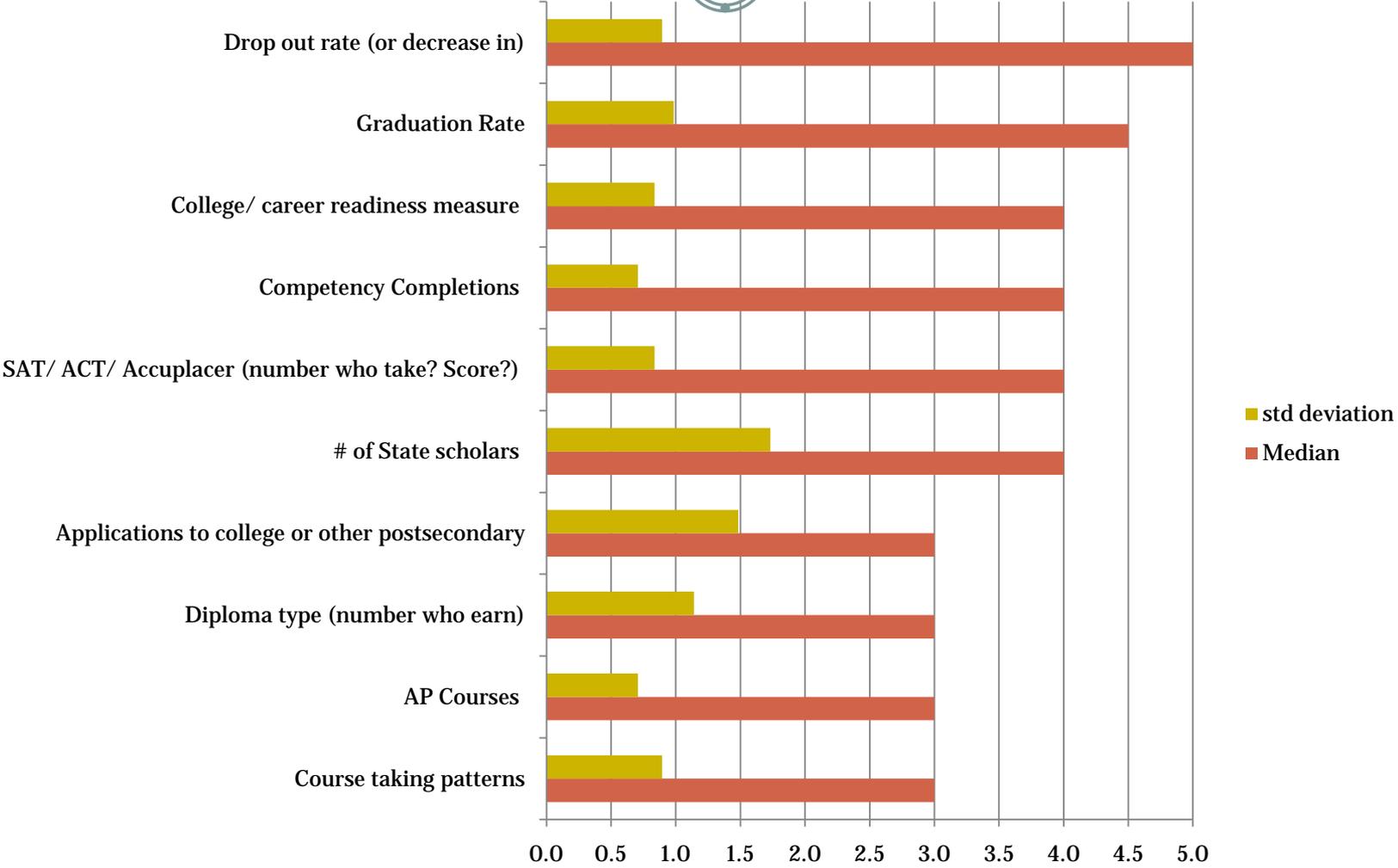
Indicator Values

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- AYP Task Force members (including Emma Rous) provided ratings
- Used median values to try to summarize value ratings
- Many people “wanted it all”

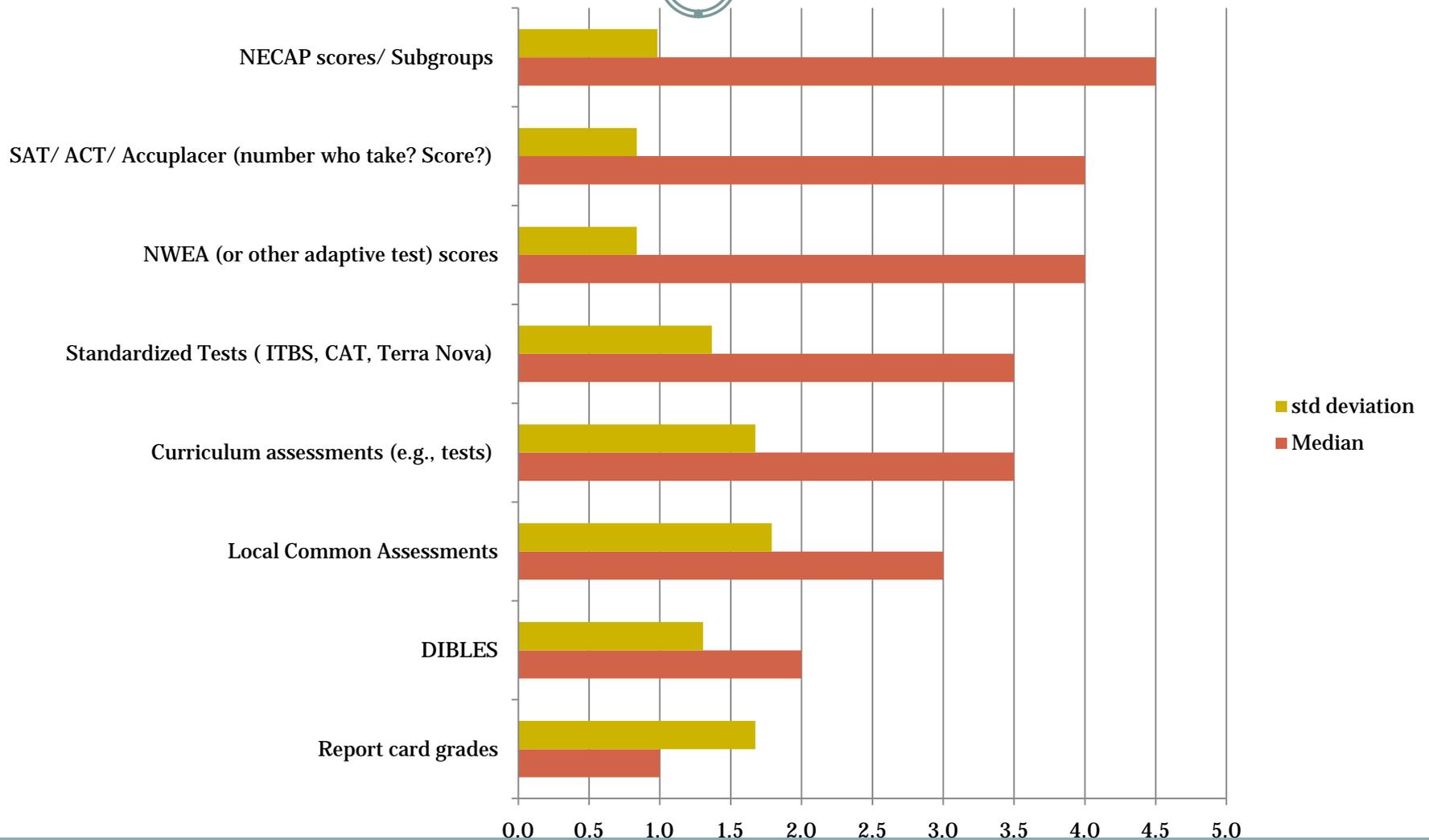
Medians/SD for “readiness” indicators

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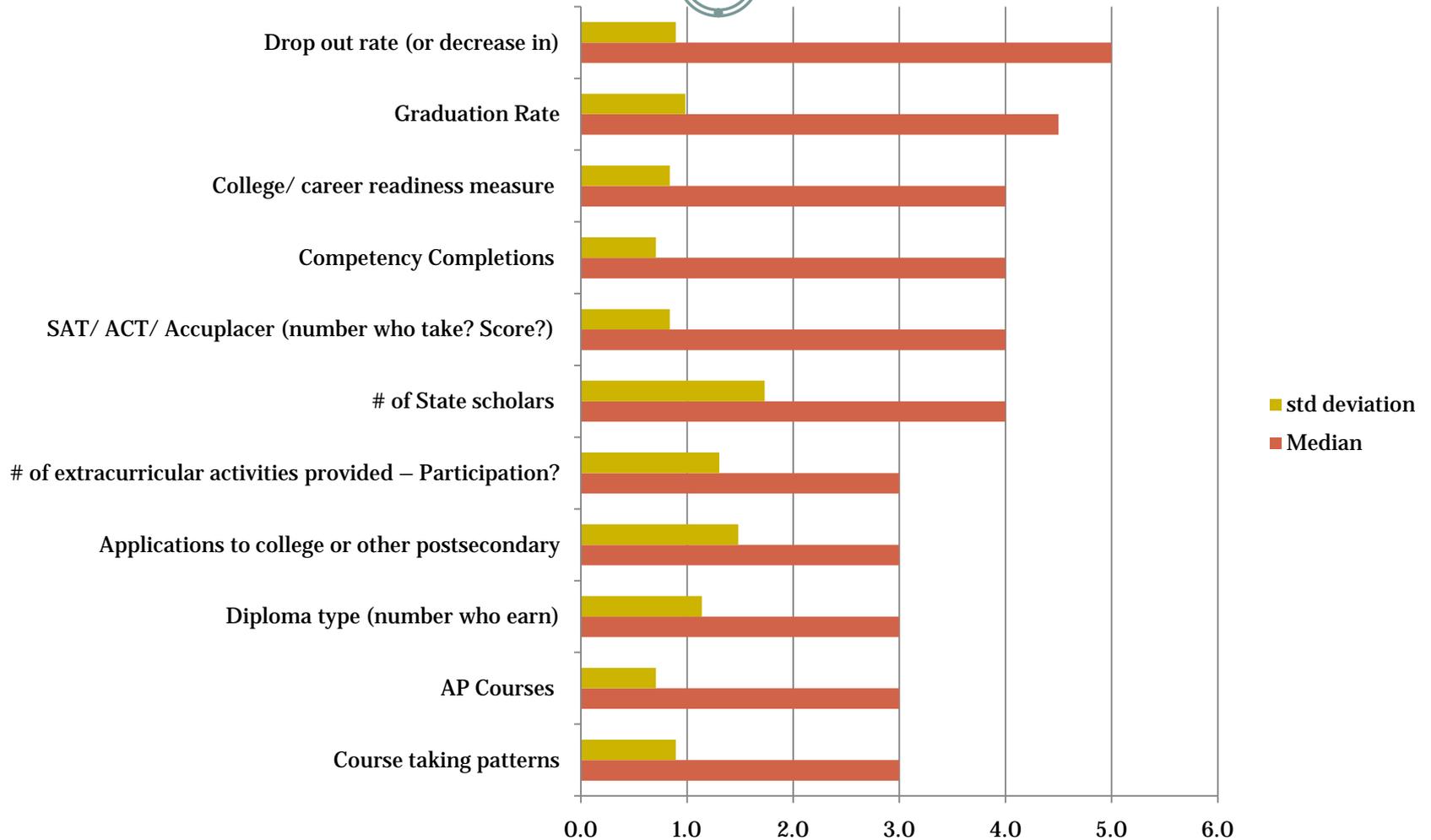
Medians/SD for “test-based” indicators

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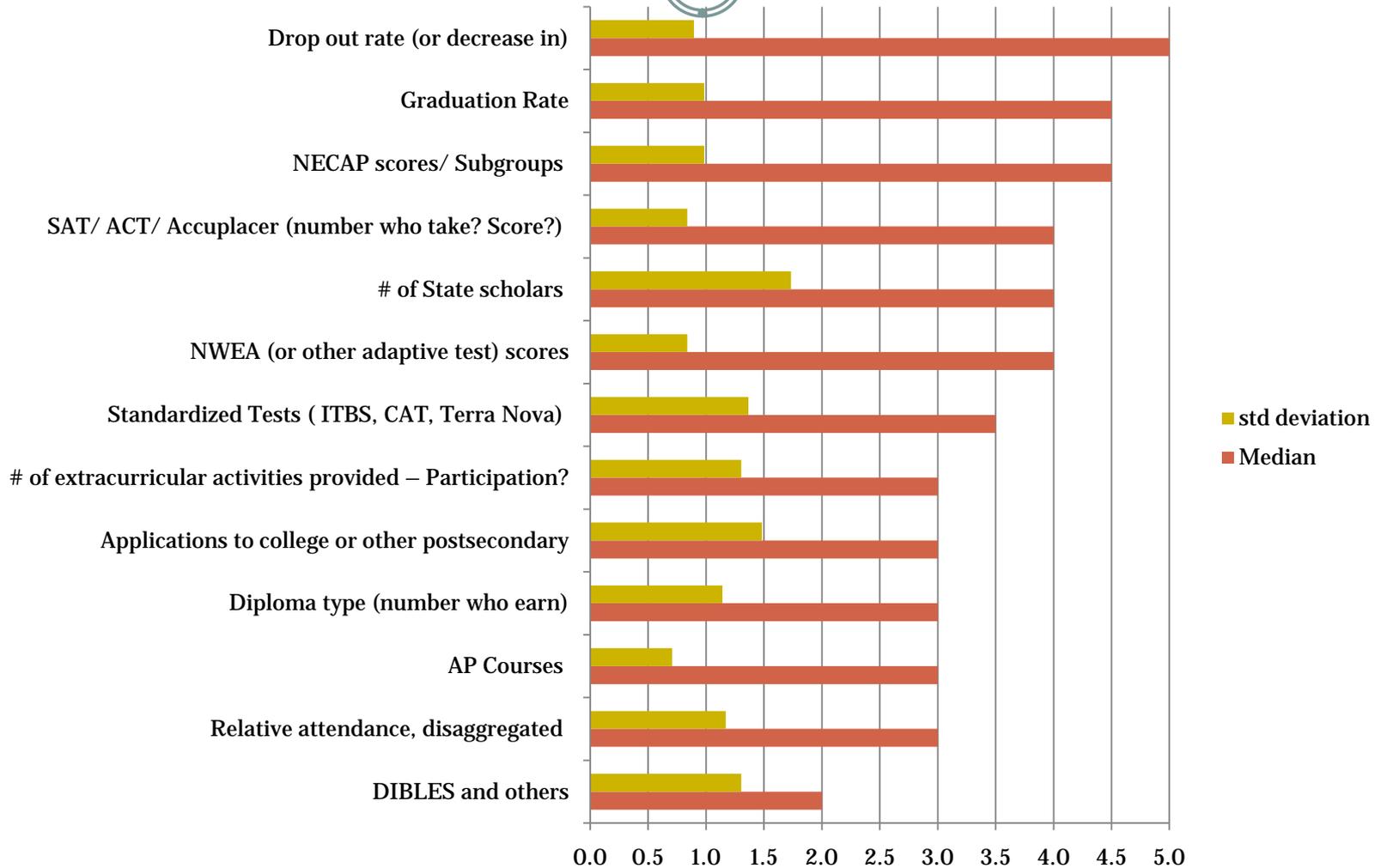
HS-only indicators

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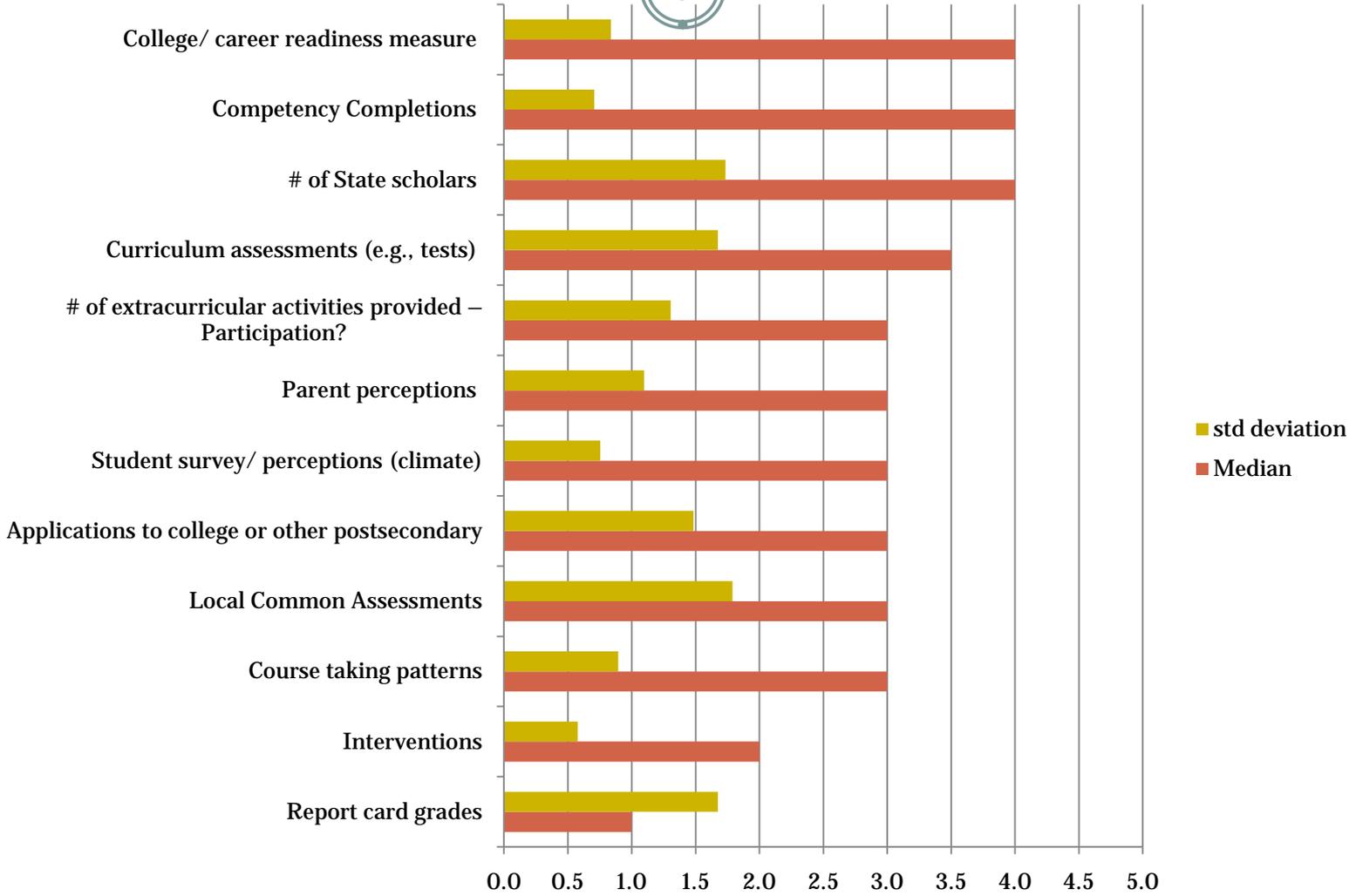
Values for already-collected indicators

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Values for indicators not collected

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Reminder!

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- Remember, this component of the Adequacy accountability system is designed to focus on **PERFORMANCE**.
- We already have a system designed to focus on **INPUTS**.
- Performance generally refers to outputs of the system (e.g., graduation rate) and not on process indicators such as teacher actions or parental support
 - We're not saying that those things aren't important. They are simply beyond the scope of our charge here.

Question #1: Which of these do you REALLY want to collect (1=not important; 5=critically important). Be parsimonious!

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Indicator	Importance Ranking	
	K-8	HS
Local Common (w/in district) Assessments		
Completion of Competency Exams		
College/ career readiness measure (<u>other than SAT/ACT</u>)		

Question #2: Which of these **already-collected** indicators do you **REALLY** want to include (1=not important; 5=critically important)? Let's focus on **minimizing redundancy!**

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Indicator	Importance Ranking	
	K-8	HS
Early (K-2) reading measures		
Attendance		
AP Courses (#enrolled/#passing)		
Applications to college or other postsecondary		
Standardized Tests (NWEA, ITBS, CAT, Terra Nova)		
SAT/ ACT/ Accuplacer (number who take? Score?)		
NECAP scores/ Subgroups		
Diploma type (number who earn each type)		
Graduation Rate		
Drop out rate (or decrease in)		

Question 3: So what's the final list?

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- **Elementary/Middle School?**
- **High School?**

Student Growth Percentiles

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- What questions can student growth percentiles be used to address?
- What are student growth percentiles and percentile growth projections/trajectories?
- What role do the results from growth percentile analyses play in accountability system determinations?
- What role do the results from growth percentile analyses play in program evaluations?

Relevant Questions for Parents

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- Yen (2007), from a state survey of parents, teachers and administrators, compiled a list of frequently voiced questions/concerns by various stakeholder groups.
- **Common Parent Questions**
 - Did my child make a year's worth of progress in a year?
 - Is my child growing appropriately toward meeting state standards?
 - Is my child growing as much in Math as Reading?
 - Did my child grow as much this year as last year?

Relevant Questions for Teachers

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- **Did my students make a year's worth of progress in a year?**
- **Did my students grow appropriately toward meeting state standards?**
- **How close are my students to becoming Proficient?**
- **Are there students with unusually low growth who need special attention?**

Relevant Questions for Administrators

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- Did the students in our district/school make a year's worth of progress in all content areas?
- Are our students growing appropriately toward meeting state standards?
- Does this school/program show as much growth as that one?
- Can I measure student growth even for students who do not change proficiency categories?
- Can I pool together results from different grades to draw summary conclusions?

Descriptive Questions

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- Note that the questions put forward by stakeholders are primarily descriptive
- The questions are only peripherally associated with causality.
- High stakes accountability has transformed questions about student growth into questions about responsibility/cause: Teacher and School Effectiveness such as the case with Value-Added Modeling (VAM).
- We argue that the place to begin is with description and a model that supports such uses.

Descriptive Accountability

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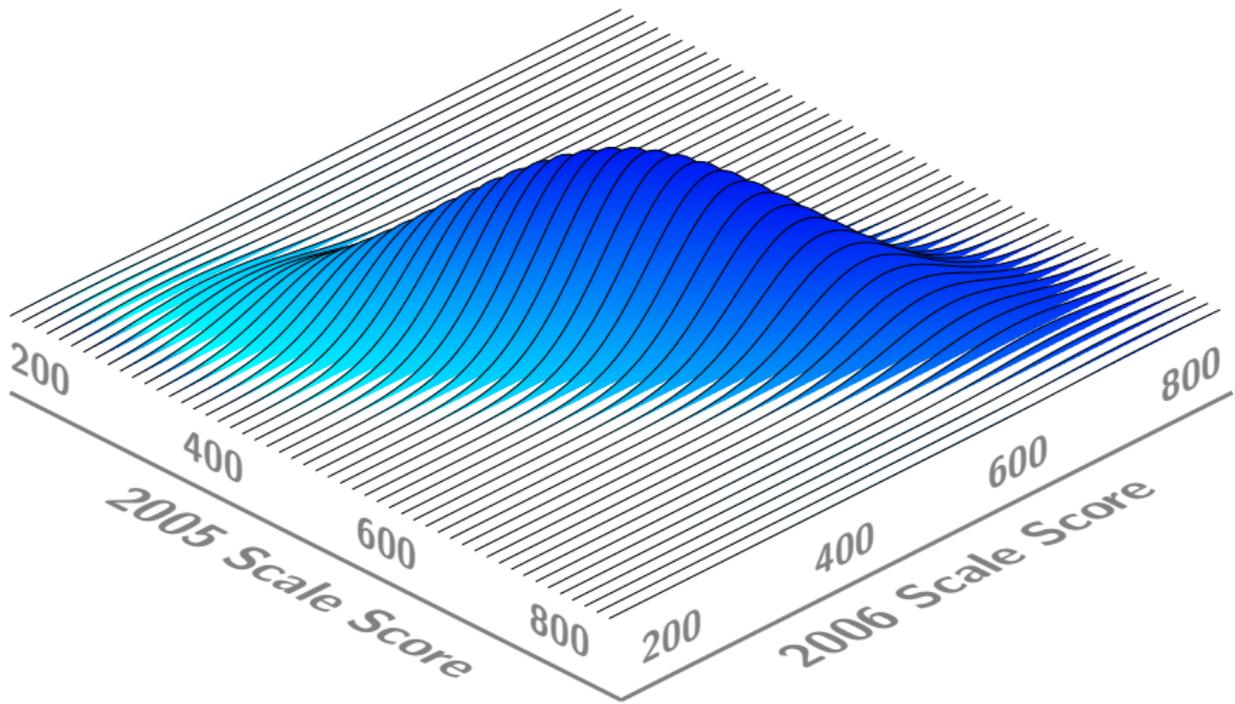
Accountability system results can have value without making causal inferences about school quality, solely from the results of student achievement measures and demographic characteristics. Treating the results as descriptive information and for identification of schools that require more intensive investigation of organizational and instructional process characteristics are potentially of considerable value. Rather than using the results of the accountability system as the sole determiner of sanctions for schools, they could be used to flag schools that need more intensive investigation to reach sound conclusions about needed improvements or judgments about quality [Linn, 2008, p. 21, emphasis added].

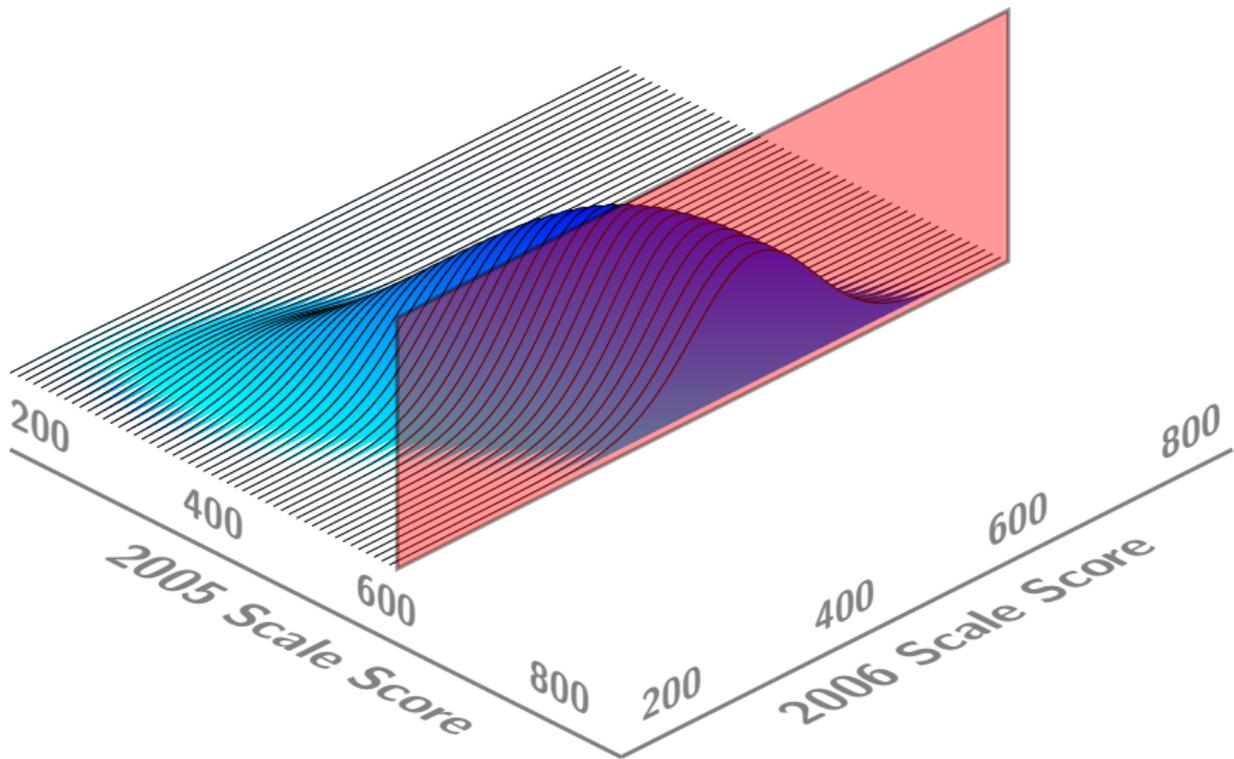
Describing Student Growth

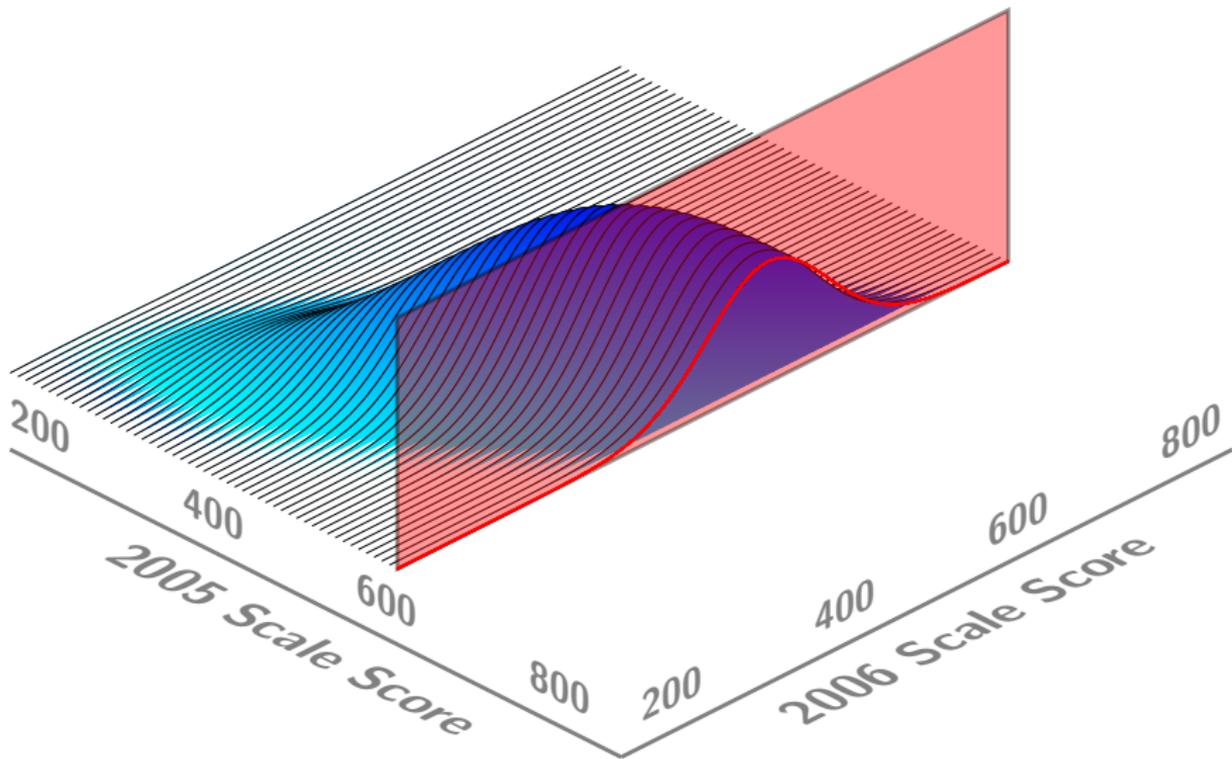
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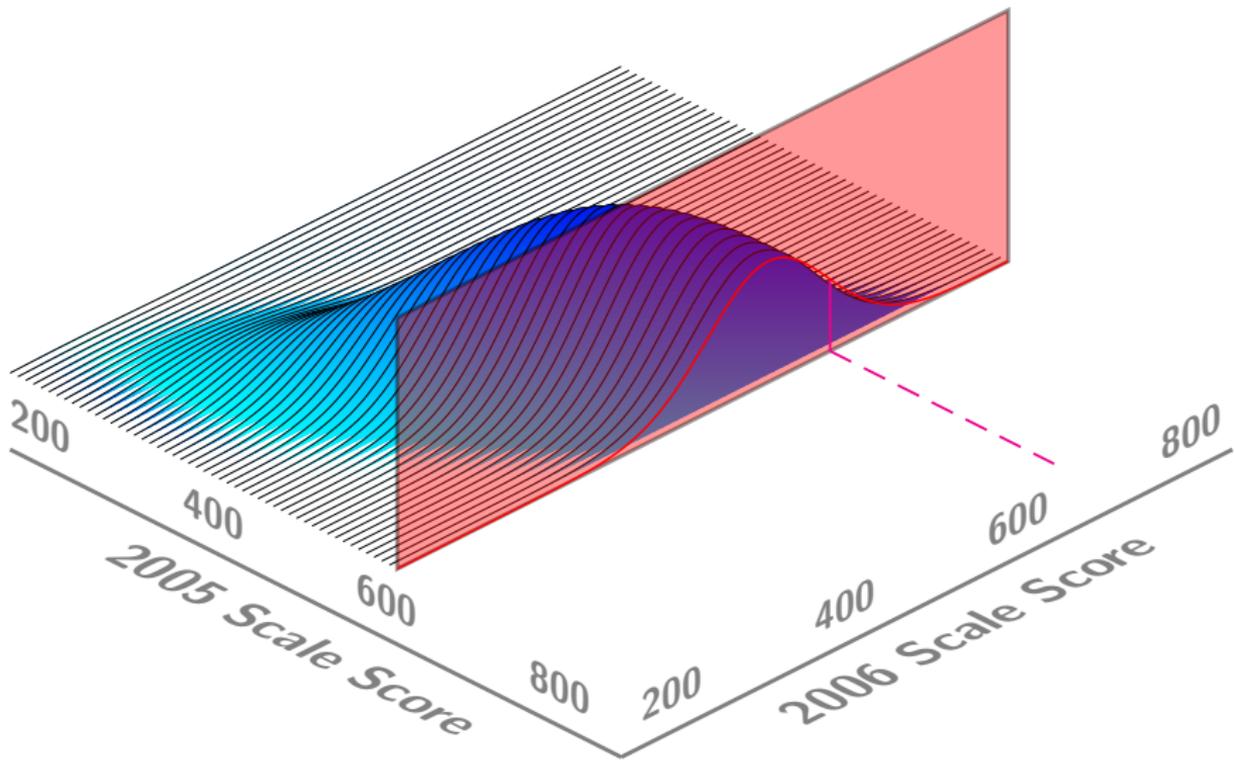
- Measuring student growth, even with a vertical scale, is not a simple task.
- Some believe a vertical scale simplifies the task of measuring student growth.
- Even with an interval (or ratio) scale, growth is not easy to interpret.

- Consider, for example, a child's height.
 - A child might grow 4 inches between ages 3 and 4.
 - 4 inches is a well understood quantity.
 - The 4 inch increase becomes really meaningful only when understood alongside the growth of other 3 to 4 year olds.
- Student growth percentiles were developed to provide a normative context for describing student growth.



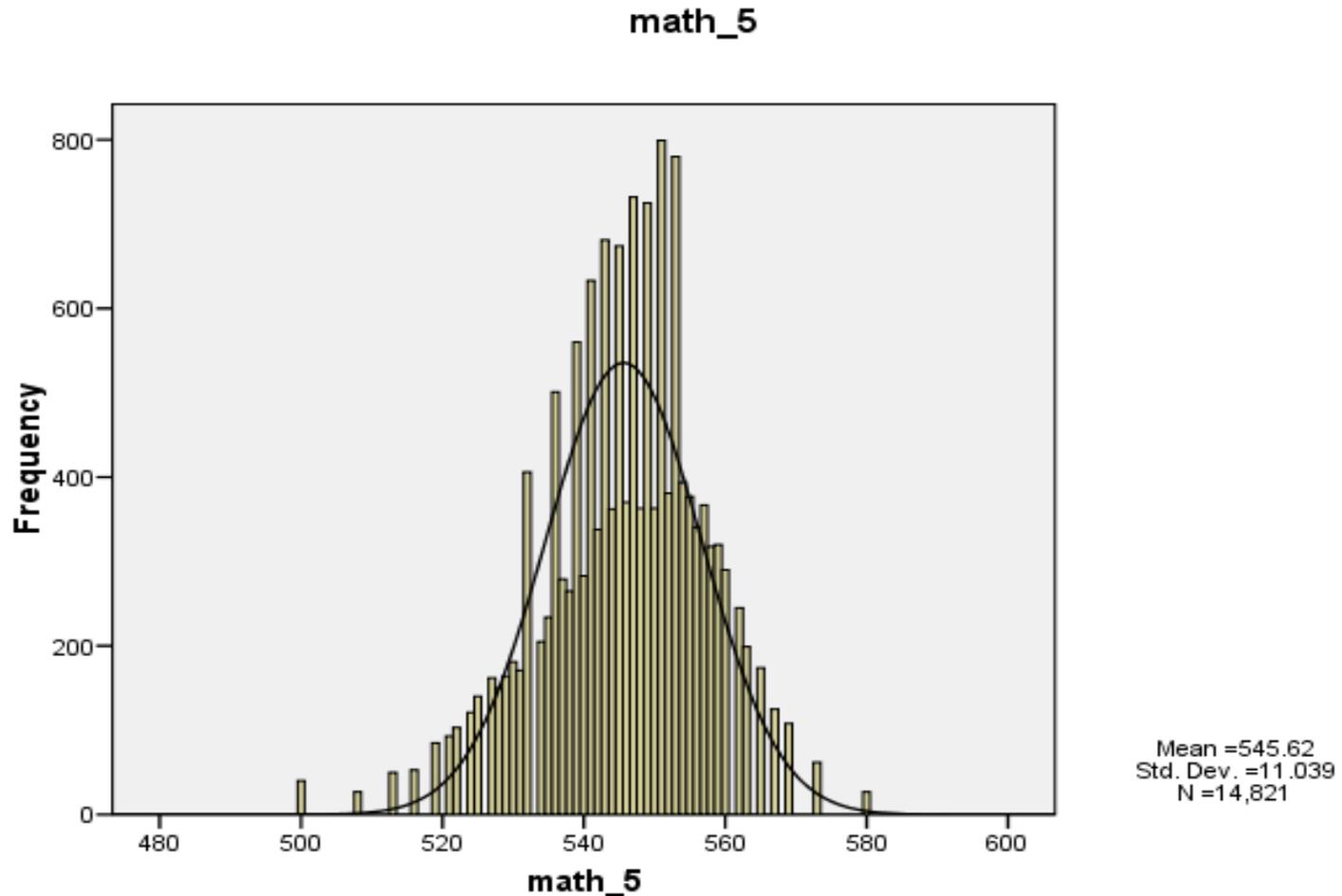






Real data are a little noisier

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Student Growth Percentiles

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Should we be surprised with a child's current achievement given their prior achievement?

- Given a student's prior scale scores and the associated conditional density, their current scale score corresponds to a percentile of that conditional distribution.
 - In other words, comparing a student's growth to students with the same prior score history reveals how well that student performed relative to other students with the same history.
- This percentile is the student's growth percentile.
- Growth percentiles are closely related to estimating the probability of observing a student's current achievement taking account of their past achievement:
 - $\Pr(\text{Current Achievement} | \text{Past Achievement})$.
- As such, growth percentiles describe the rarity of a student's current achievement conditional upon their prior achievement.

Student Growth Percentiles

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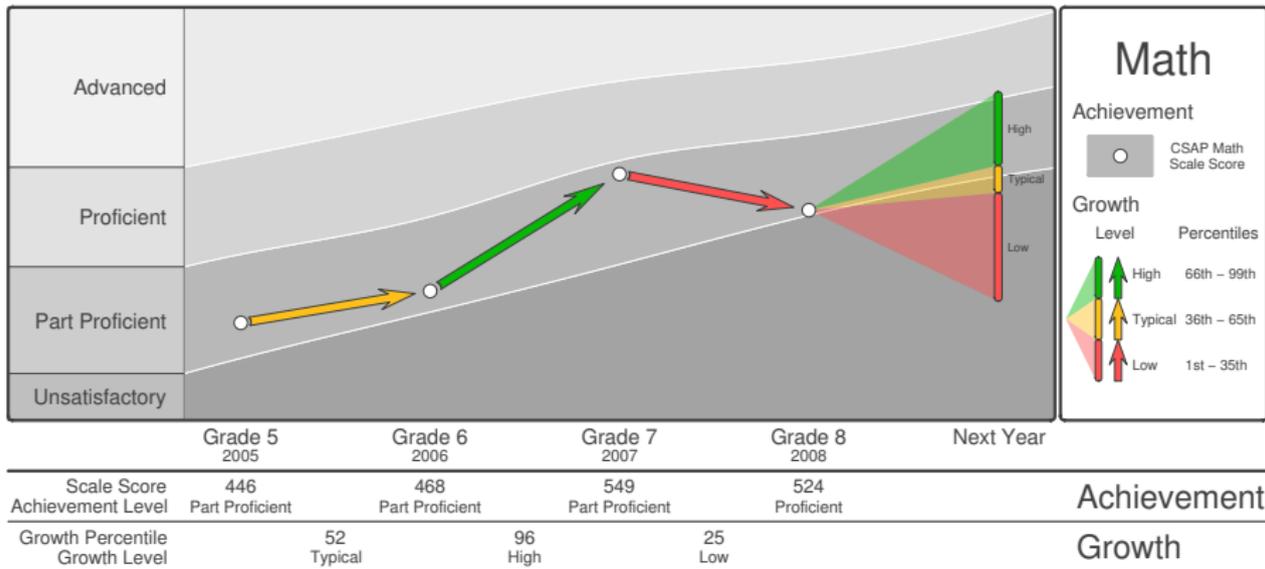
Should we be surprised with a child's current achievement given their prior achievement?

- Student growth percentiles answer this question.
- Consider a low achieving student with 90th percentile growth and a high achieving student with 10th percentile growth.
 - The low achieving student grew at a rate exceeding 90 percent of similar students.
 - The high achieving student grew at a rate exceeding just 10 percent of similar students.
 - The low achiever's growth is more exemplary (probabilistically) than the high achiever's.
- Judgments about the **adequacy** of student growth require judgmental and/or external criteria.

Relationship Between Growth and Status

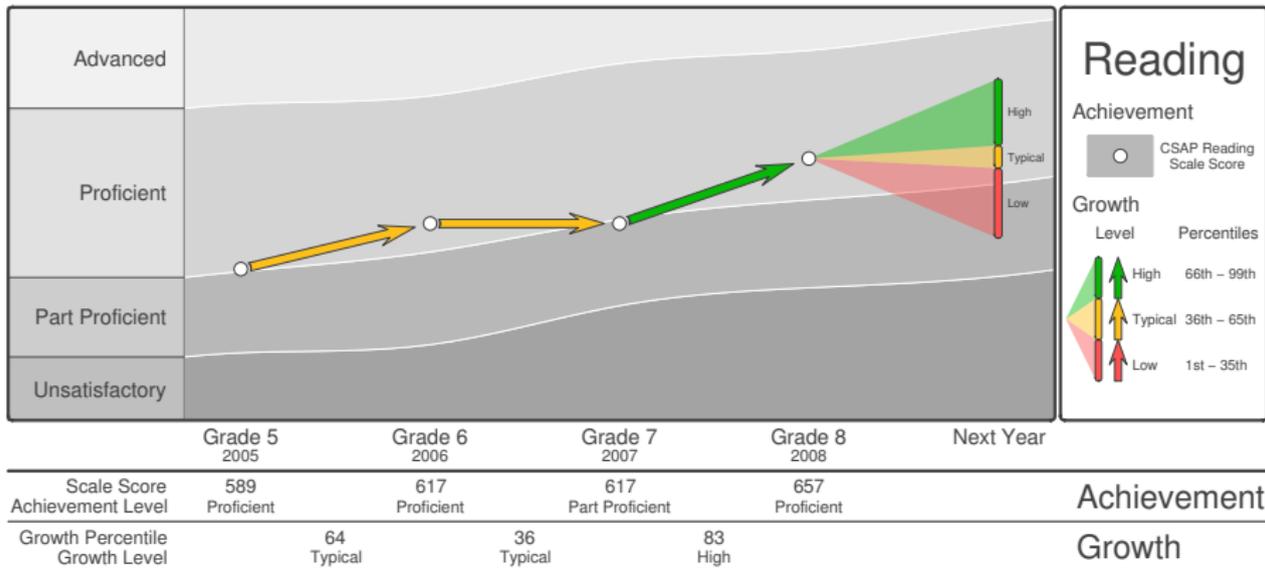
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- Remember for every starting point (score history), there is a distribution of scores in Year 2 (or Year n)
- In other words, for every starting point, there will be a range of growth percentiles from 1 to 99
- Therefore, growth percentiles are completely **unrelated** to initial status (i.e., score history)
- This means that growth percentiles are an extremely fair way to describe student growth all along the achievement continuum.



Achievement

Growth



Achievement

Growth

Aggregating Student Growth Percentiles

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- For program and instructional uses within a school, it is critical to have access to each student's growth percentile
- For school accountability purposes, it is useful to have a summary measure
- Often we use an “average” or the mean
- However, for several reasons, the median—or middle value—is more appropriate for student growth percentiles

What's the Median?

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- 10
- 20
- 30
- 40
- 50

• Median = ?

- 5
- 20
- 30
- 40
- 90

• Median = ?

The Colorado Reporting System

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- The public website

https://cdeapps.cde.state.co.us/growth_model_public/

- And the private website:

https://cdeapps.cde.state.co.us/growth_model_demo/

Homework

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- Please complete and email to Deb your ratings (by December 7th) on the following two slides:

Homework Question #1: Please indicate whether you think we should use, if possible and valid, the indicator for growth (g), improvement (i), status (s), or multiple (m).

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	Growth/Improve/ Status	
Indicator	K-8	HS
Local Common (w/in district) Assessments		
Competency Completions		
College/ career readiness measure (other than SAT/ACT)		

Homework Question #2: Please indicate whether you think , if possible and valid, we should use the indicator for growth (g), improvement (i), status (s), or multiple (m).

Indicator	Growth/Improve/ Status	
	K-8	HS
Early (K-2) reading measures		
Attendance		
AP Courses (#enrolled/#passing)		
Applications to college or other postsecondary		
Standardized Tests (NWEA, ITBS, CAT, Terra Nova)		
SAT/ ACT/ Accuplacer (number who take? Score?)		
NECAP scores/ Subgroups		
Diploma type (number who earn each type)		
Graduation Rate		
Drop out rate (or decrease in)		