

Implications of Growth Modeling forSSIP: Measuring Growth Within the SSIP Process





SSIP Interactive Institutes

Albuquerque, NM; April 29-30, 2015
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Jacksonville, FL; May 12-13, 2015
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Chicago, IL; May 27-28, 2015
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Handout

- How are you currently looking at growth?
- What are the metrics?
- What populations?
- How do you use the information?
- How do you use growth to drive improvement?
- What questions do you have?

What Comes to Mind When you Think of Growth Models?

What Comes to Mind When you Think of Growth Models?

- Pros

- Intuitive
- Makes sense to teachers & parents
- Promising
- Fair
- Applicable

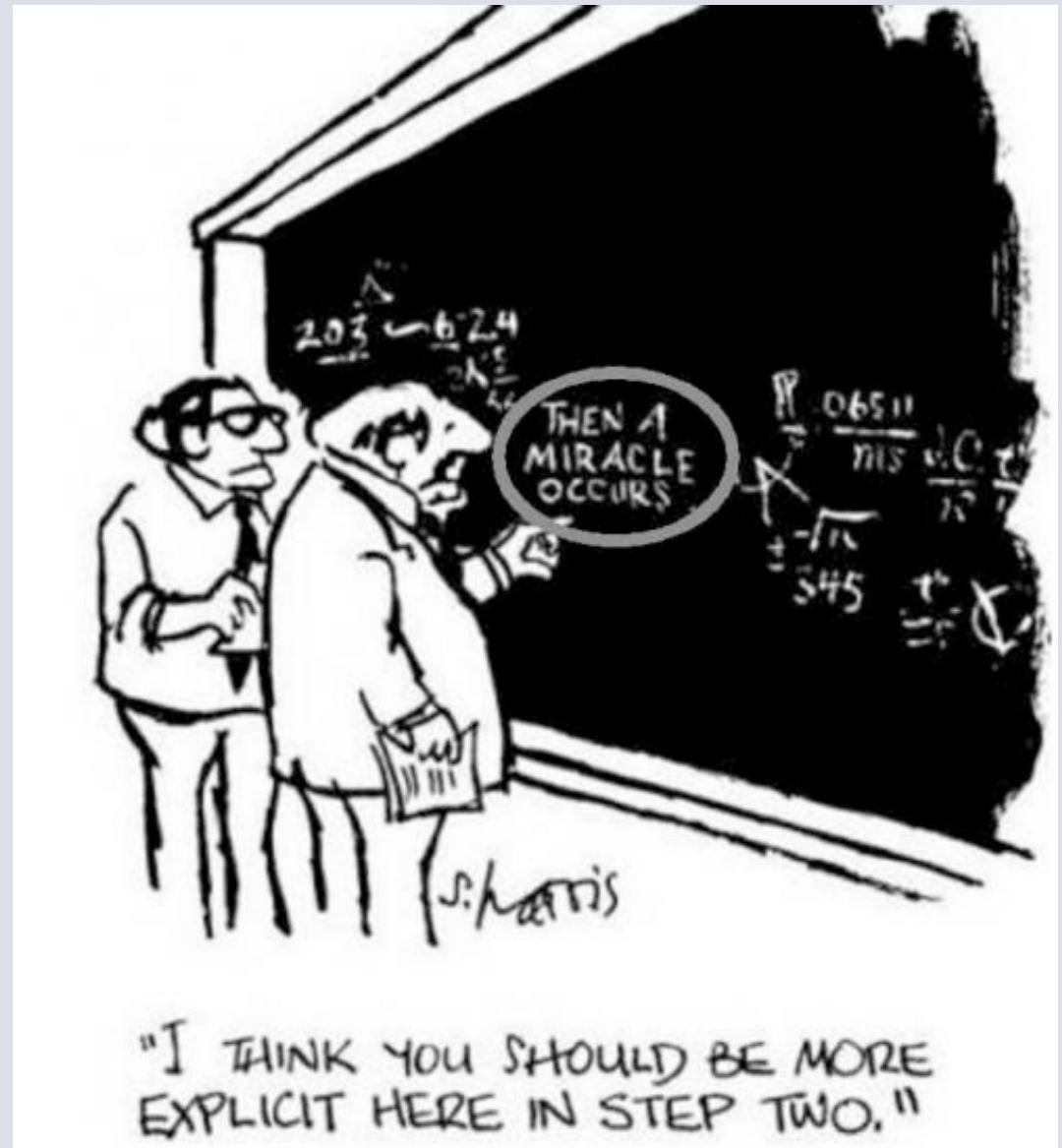
- Cons

- Confusing
- Hard to measure
- Hard to communicate
- Complicated
- Scary

Lots of terms...



And Some Magic...



Goals for Session

- Demystify growth a bit...
- What questions can be answered?
- Key questions/concepts to ask?
- What do we know already?
- Some (not all) approaches
- Apply it to SSIP

What Types of Questions Address Growth?

- Are children/students improving?
- How does child/student growth compare to general education peers?
- Are lower performing children/students closing a performance gap?
- Are children/students approaching proficiency?
- Are particular programs/districts or providers/teachers more effective at positively impacting growth than others?

Why Growth?

- Status Measures are coarse
- Don't reflect change or improvement
- Don't inform instruction
- Not sensitive to effective intervention
- Some students don't cross proficiency thresholds

Considerations and Decisions

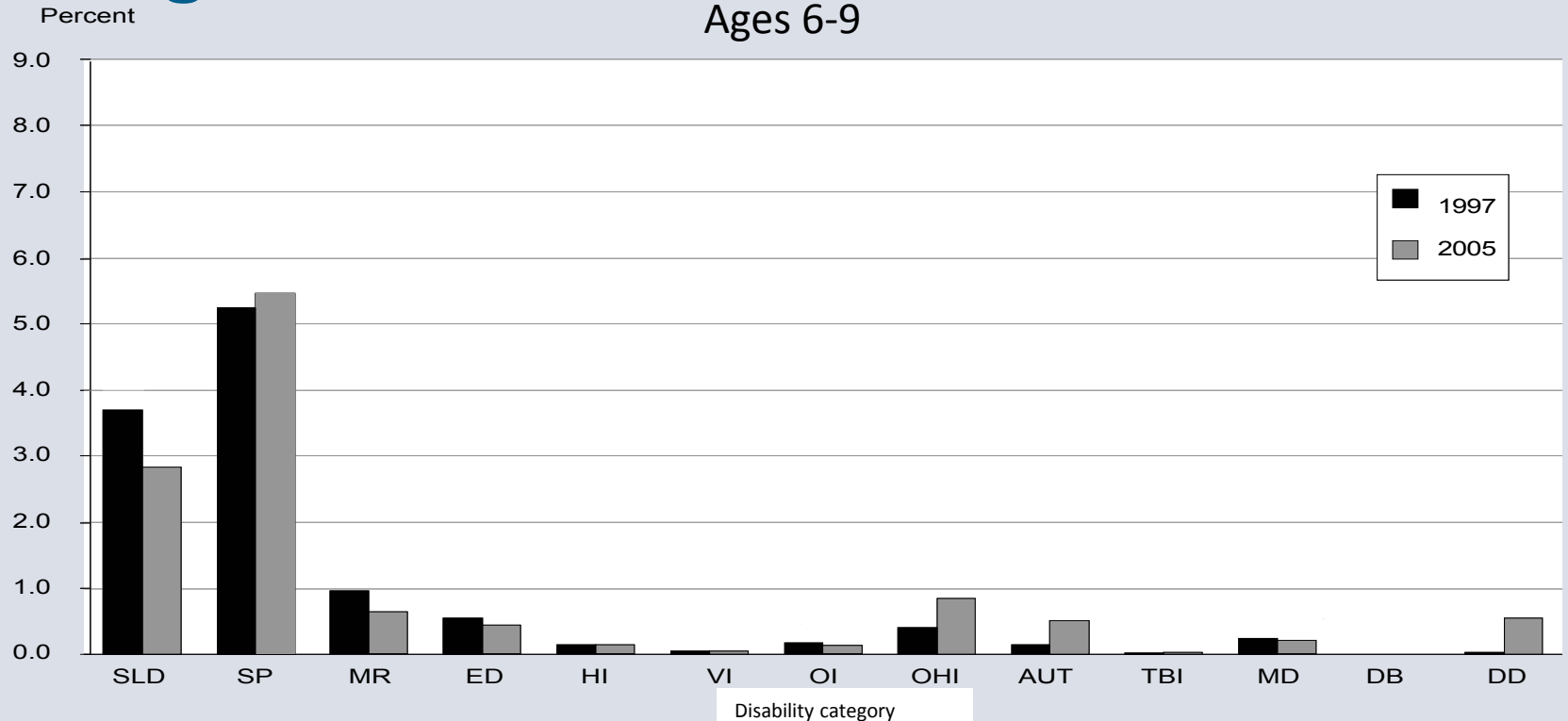
- Data availability and quality
- Assessments
 - Vertical scales
 - Sensitivity to growth for population
- Selecting the populations of interest
- Population shifts
- Participation in testing programs
- Across Year vs. Within Year Growth
 - Linear vs. Nonlinear Growth
- Comparison – growth compared to what?
- Active Area of Research – Still a lot we don't know

Some Things We Do Know...

- Population does shift over time
- Population is not the same across years/grades
- Growth is probably not linear or constant
- Quite variable

Identification of School-Age Children for IDEA Services, by Disability Classification and Age

Ages 6-9

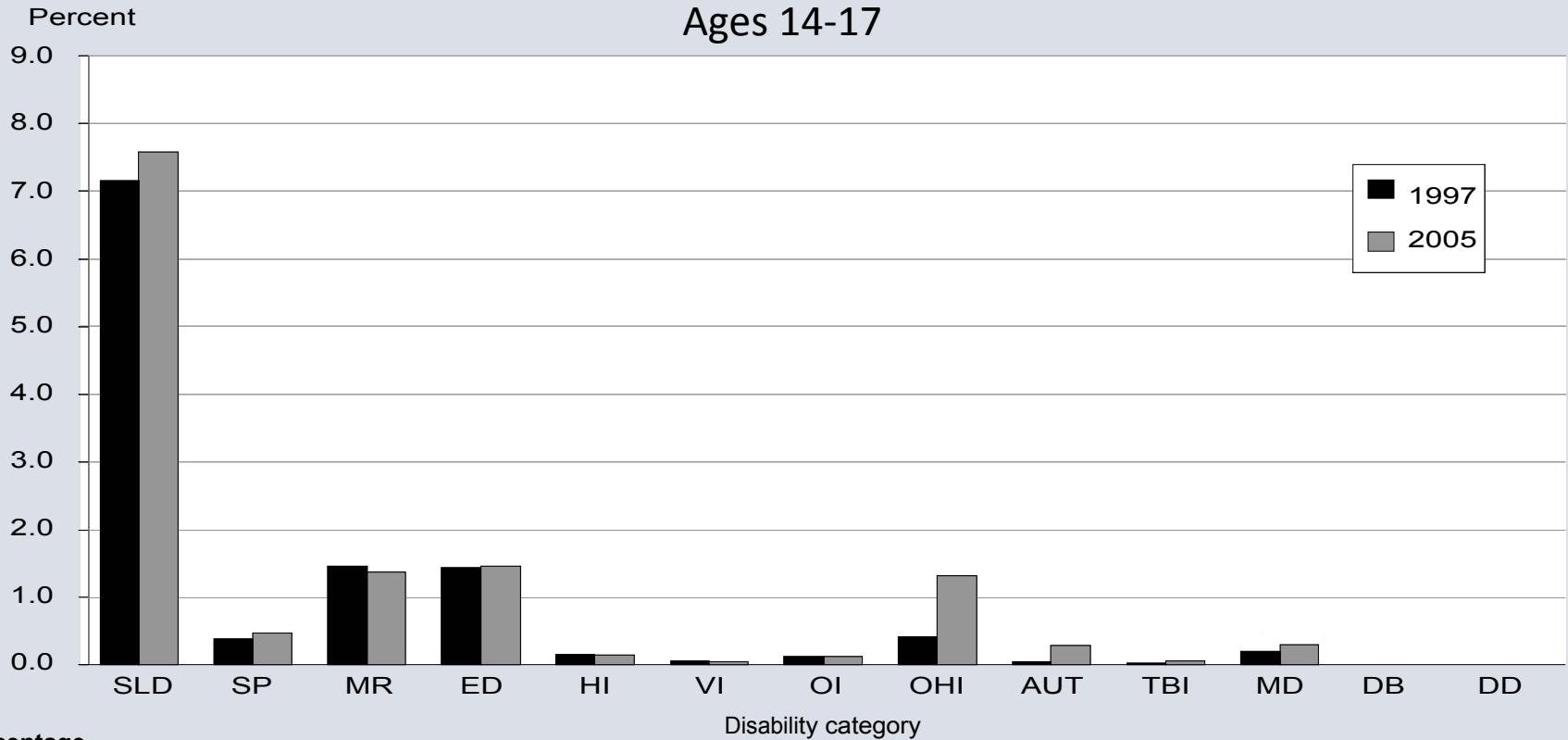


Percentage

1997	3.7029	5.2336	0.9586	0.5471	0.1432	0.0528	0.1640	0.3983	0.1382	0.0185	0.2398	0.0020	0.0260
2005	2.8367	5.4631	0.6430	0.4391	0.1374	0.0510	0.1353	0.8532	0.5146	0.0299	0.2146	0.0026	0.5457
Change	-23.39	4.39	-32.92	-19.74	-4.05	-3.41	-17.50	114.21	272.36	61.62	-10.51	13.04	1998.85

Identification of School-Age Children for IDEA Services, by Disability Classification and Age

Ages 14-17

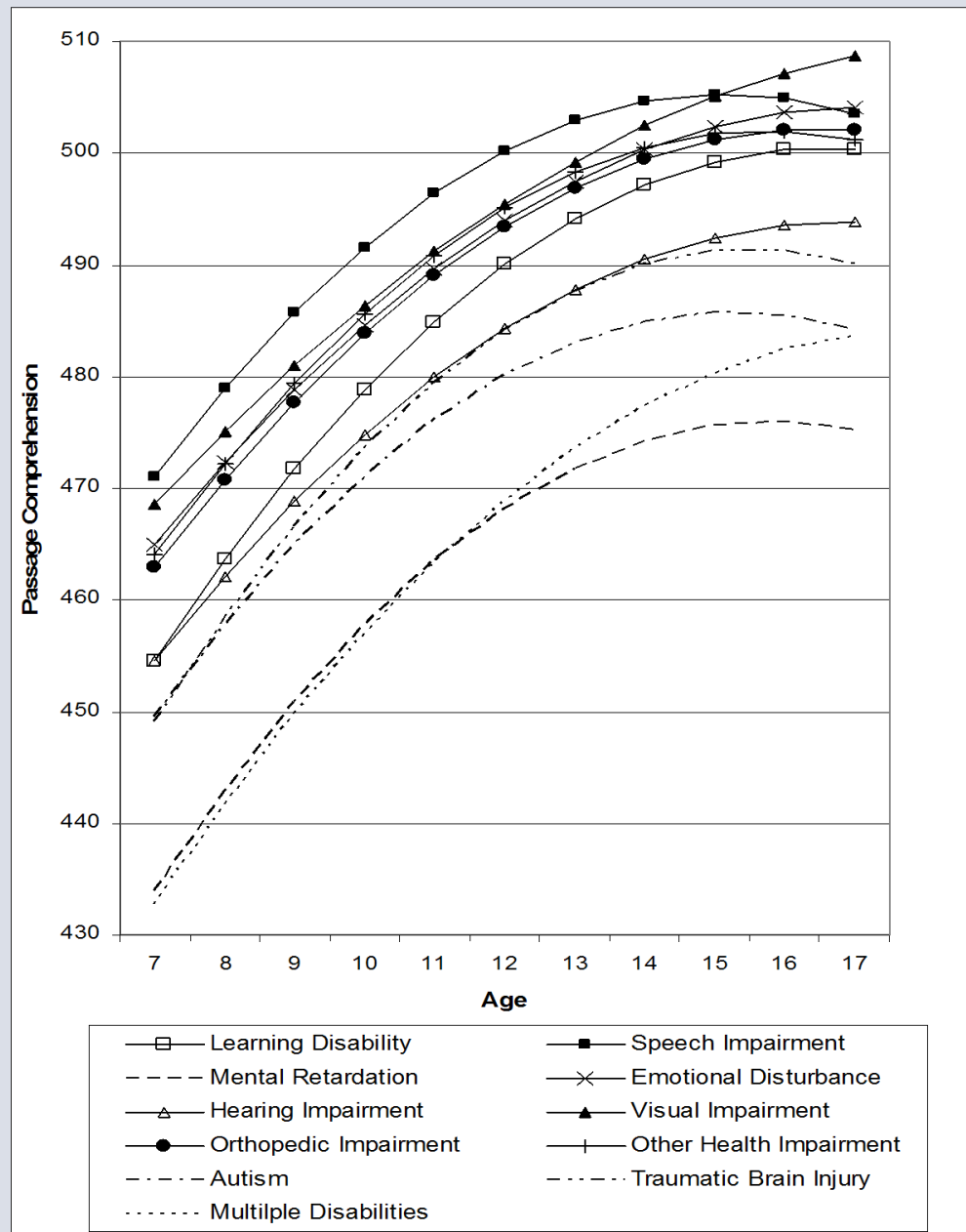


Percentage

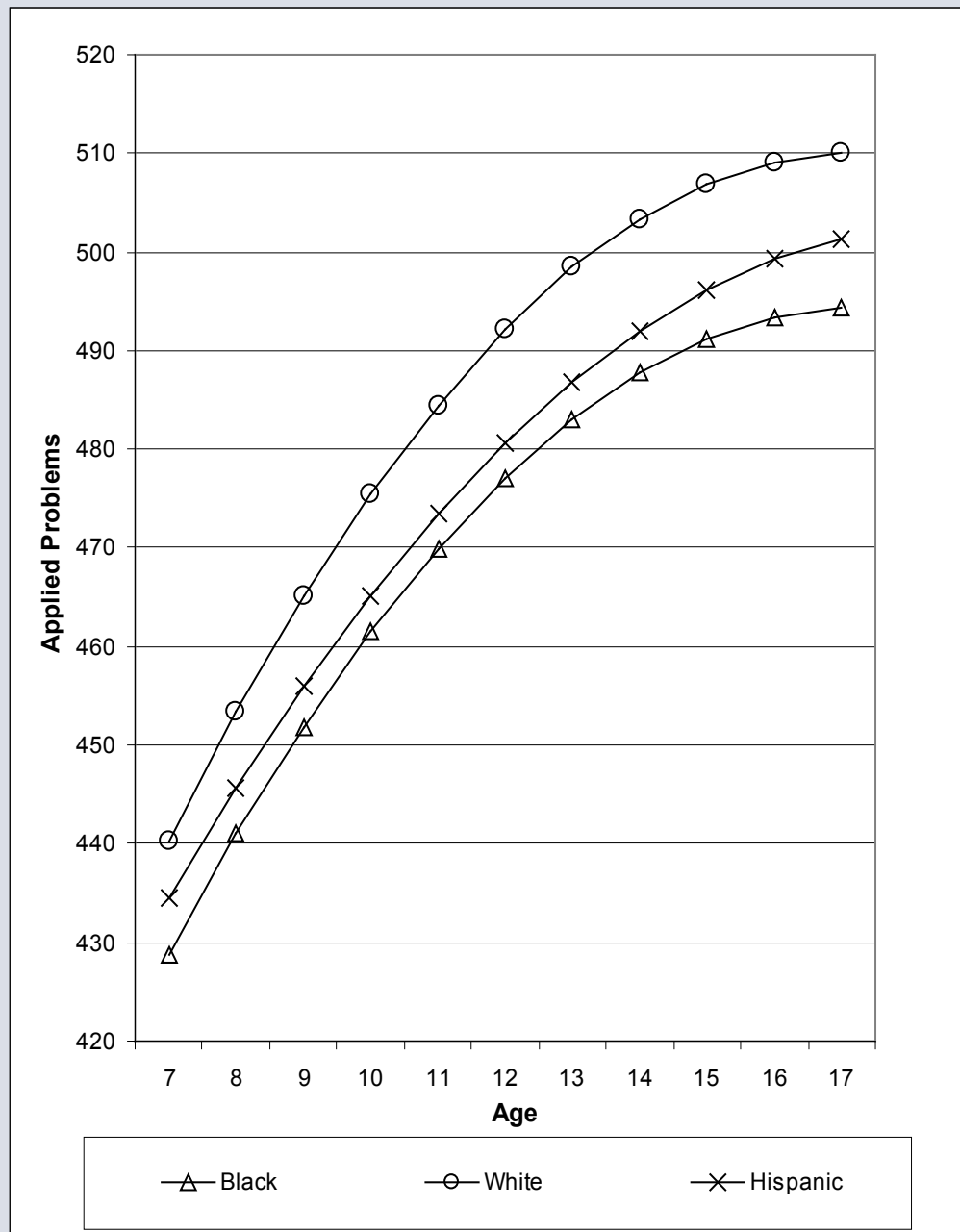
Disability category

1997	7.151	0.3779	1.4717	1.4385	0.1578	0.0604	0.1309	0.4056	0.0545	0.0317	0.2080	0.0031	†
2005	7.578	0.4552	1.3726	1.4613	0.1542	0.0533	0.1212	1.3207	0.2778	0.0610	0.2884	0.0033	†
Change	5.98	20.46	-6.73	1.58	-2.28	-11.75	-7.41	225.62	409.72	92.43	38.65	6.45	†

Reading Comprehension 7 to 17 by Disability Category



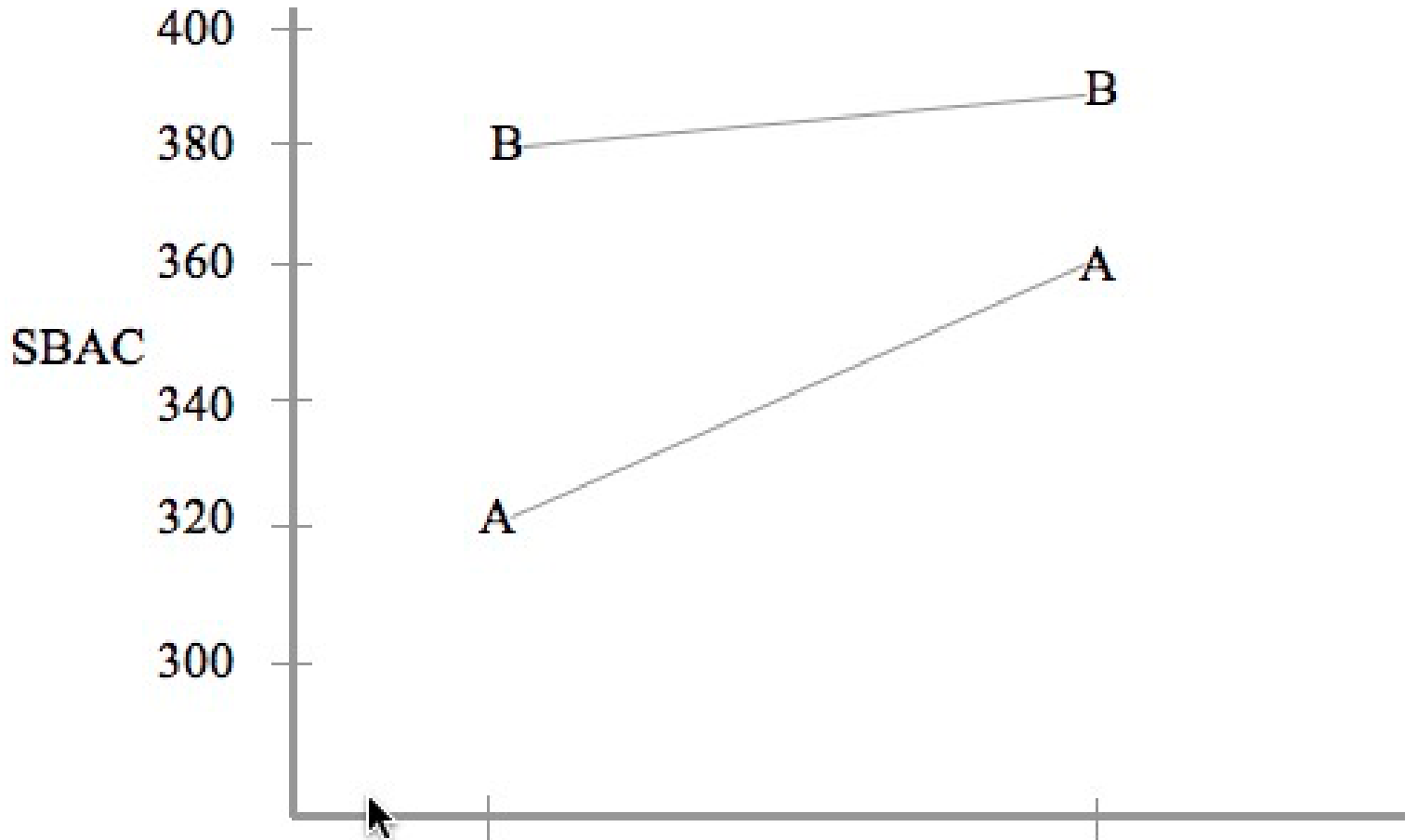
Reading Comprehension 7 to 17 by Race/Ethnicity



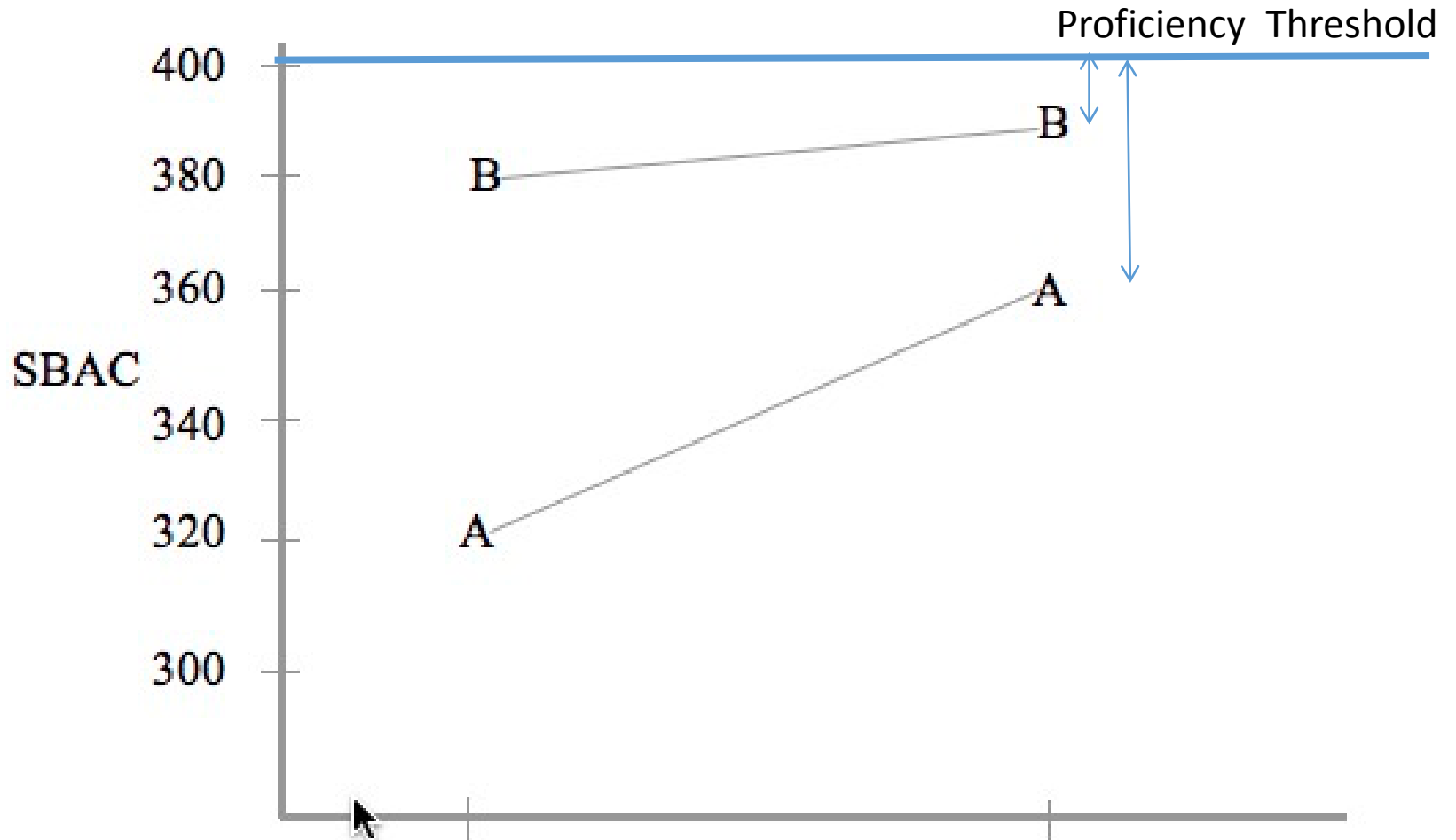
How Much Growth Is Enough?

- Absolute vs. Relative growth
- Gaps from populations or proficiency
- Predicted performance
- Similar students

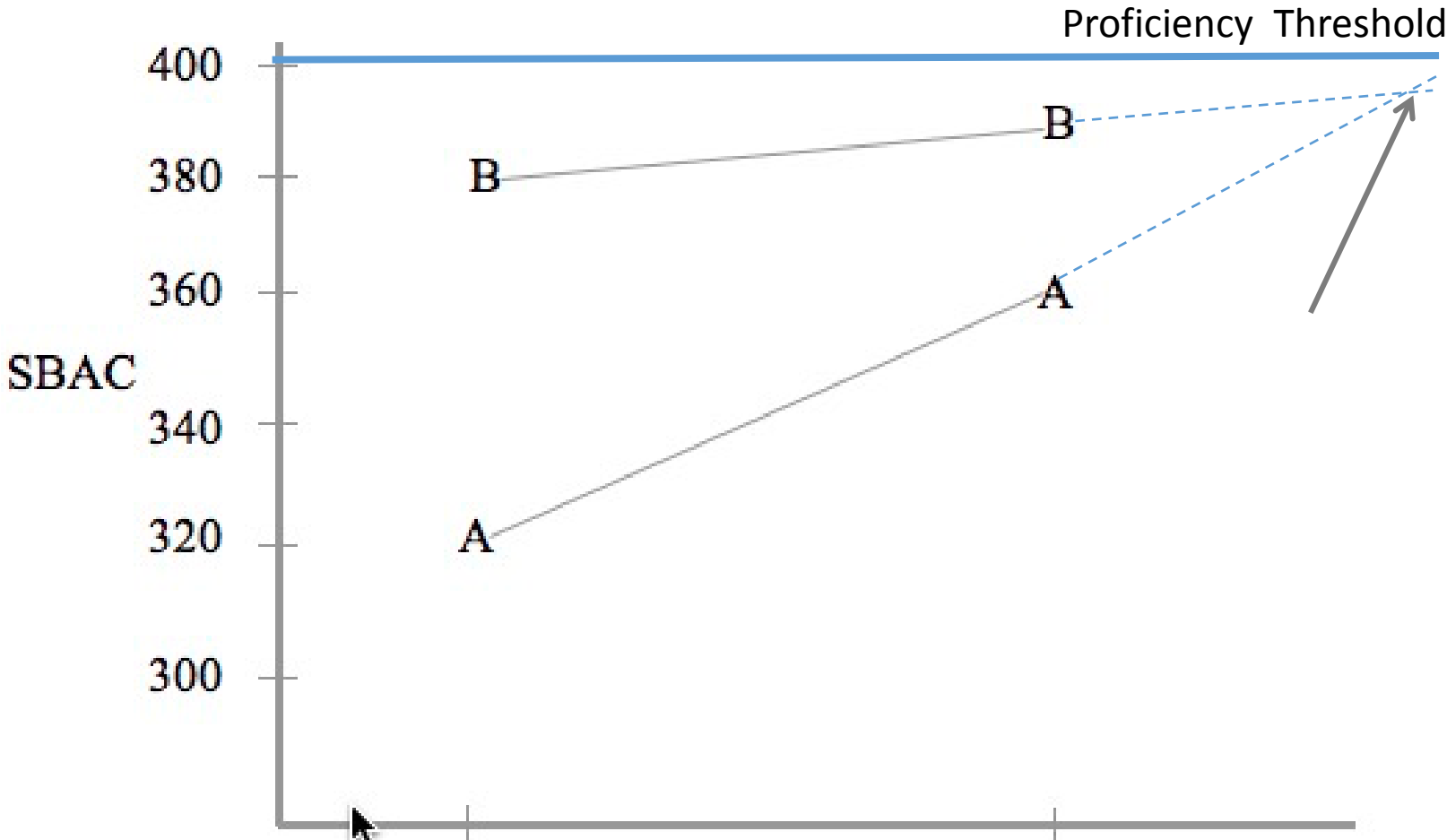
Are Gaps Closing?



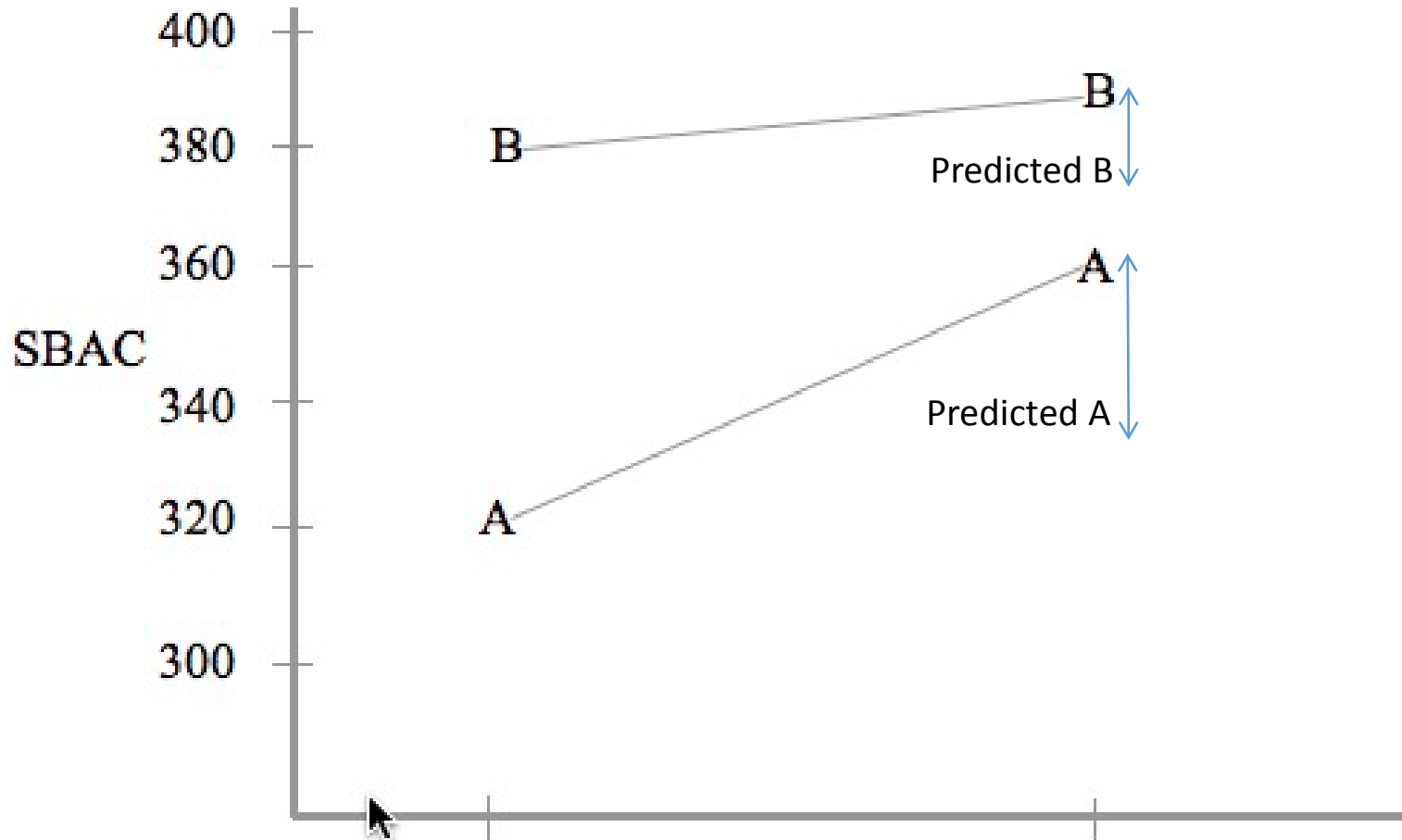
Compared to Proficiency?



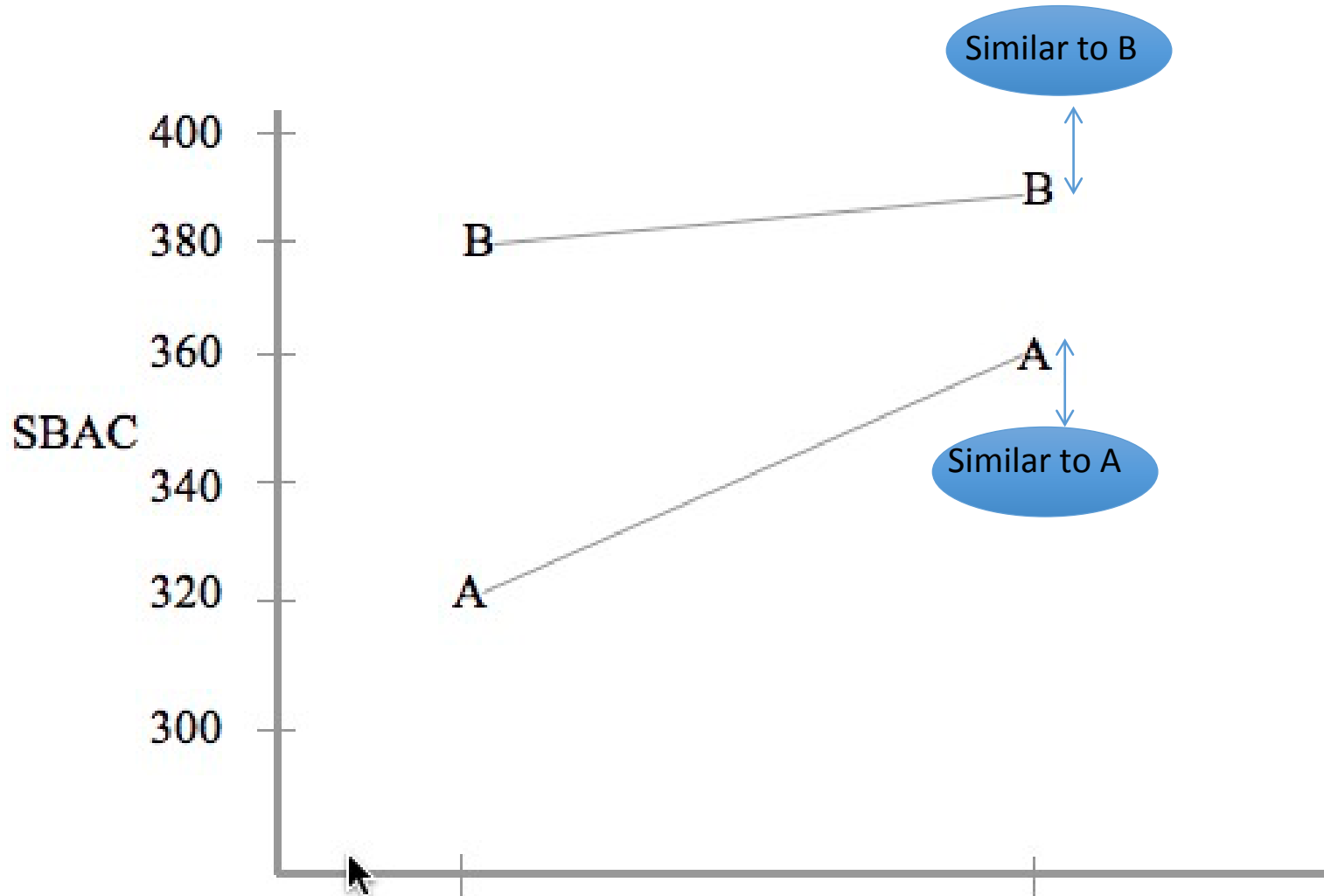
Compared to Projected Proficiency?



Compared to Predicted Performance?



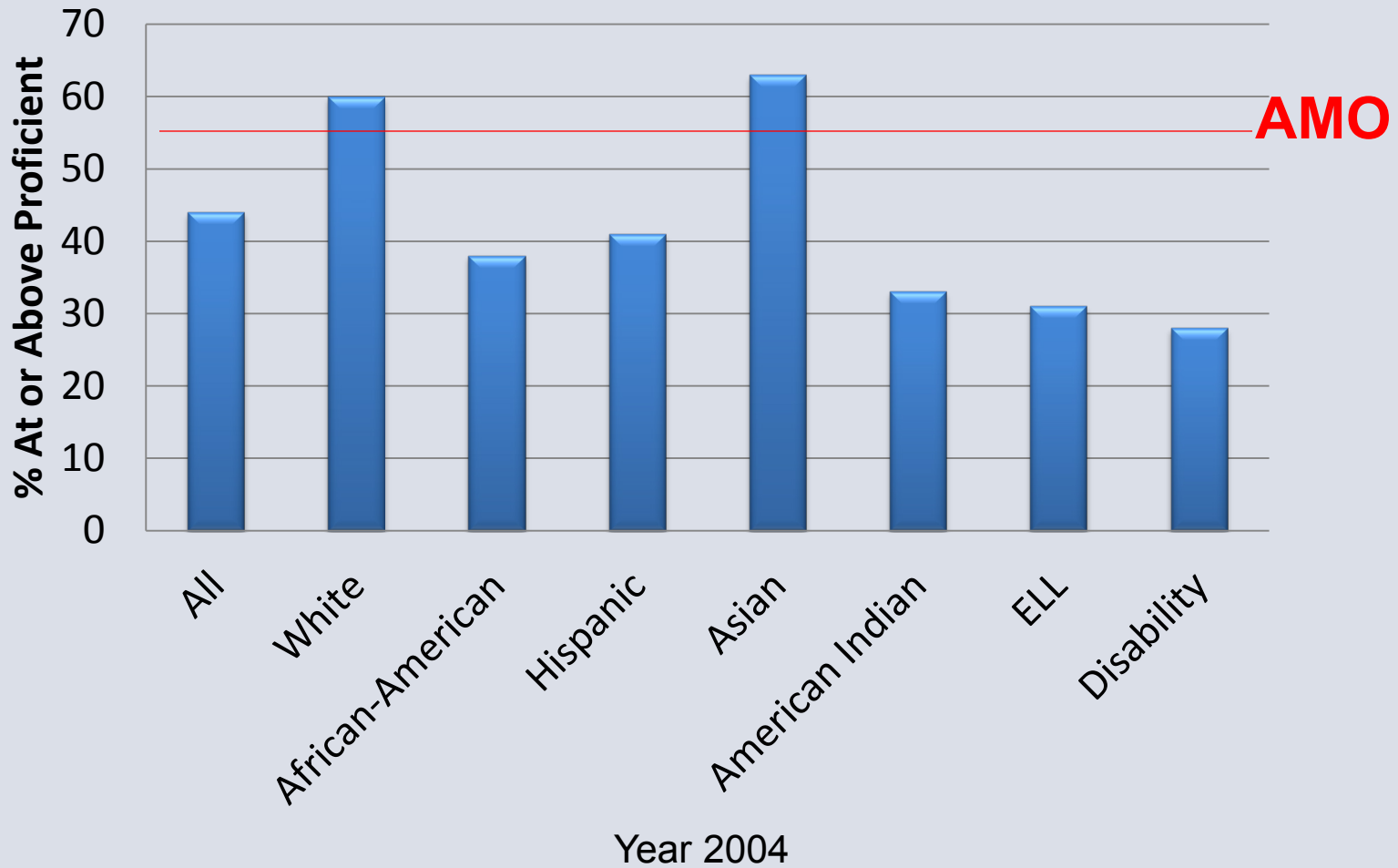
Compared to Similar Students



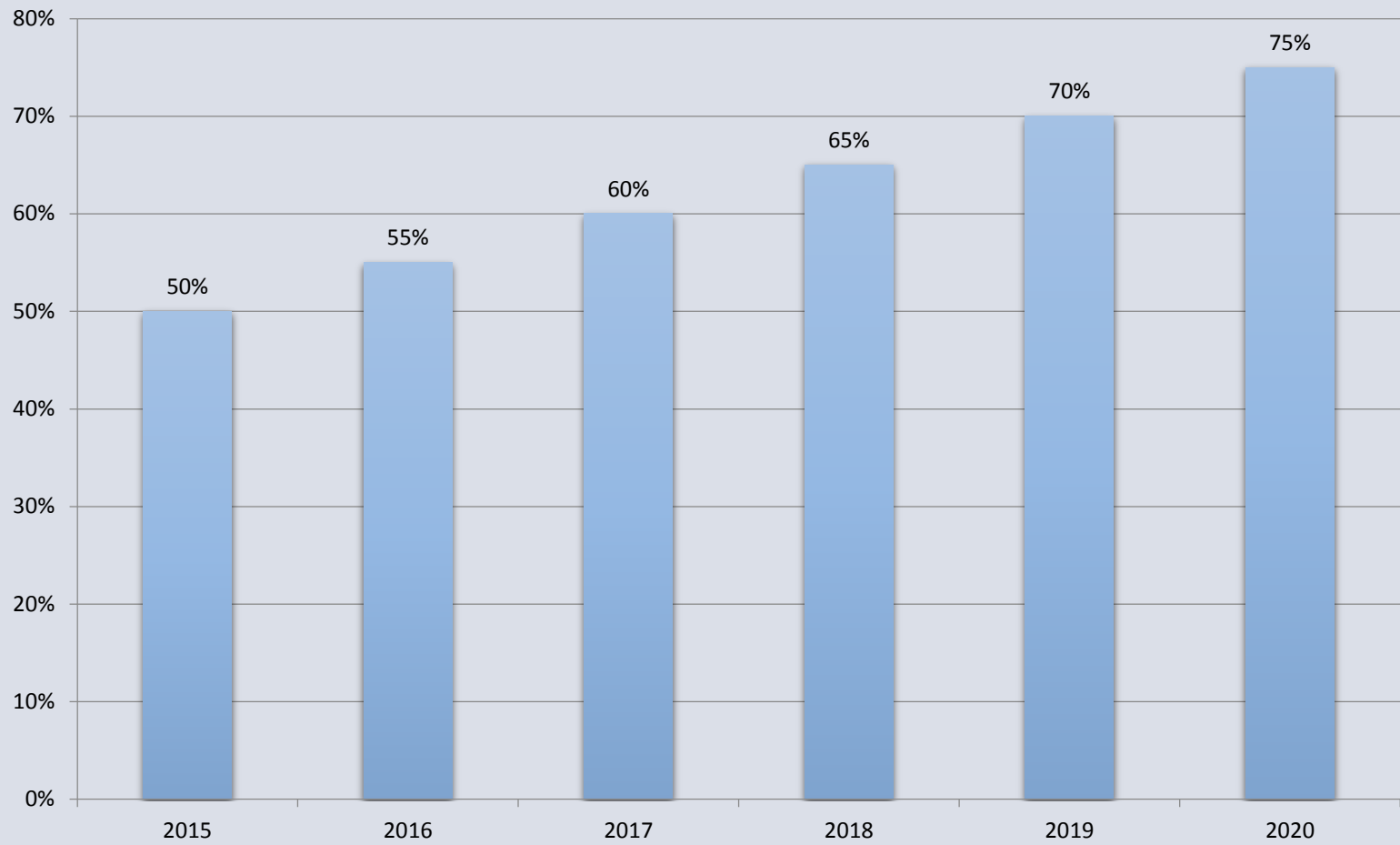
Status and Improvement Models

- Common under NCLB
- Used for accountability
- Identify schools and students in need of support
- Relatively easy to understand
- Minimum n size
- Safe Harbor
- Unrealistic for some groups

Status Model



Improvement Model



Simple Gain and Trajectory Models

- Absolute Growth
- Gain scores = (ending point – starting point)/years
- Assumes that observed growth rate will continue
- Applied to individuals or groups
- Relatively easy to understand
- Need vertical scales

Residual Gain Models

- Relative Growth
- Residual gain scores = actual score – predicted score
- Regression approaches produce more accurate predictions
- How much is enough can be subjective
- Mean residuals are zero


Projection Models

- Predicts Future Performance of Different Cohort
- Regression based
- Can identify schools or students in need of additional support
- Require longitudinal data
- Missing data can be problematic
- Tests measure different constructs at different ages

Value Tables

- Movement across or within proficiency levels
- Weights applied to positive movements
- No stringent measurement requirements or sophisticated statistics
- Different assessments can be included
- Subcategories within proficiency thresholds can be created
- Doesn't account for amount of change
- Relies on subjective judgments for cut scores and weighting

Value Table

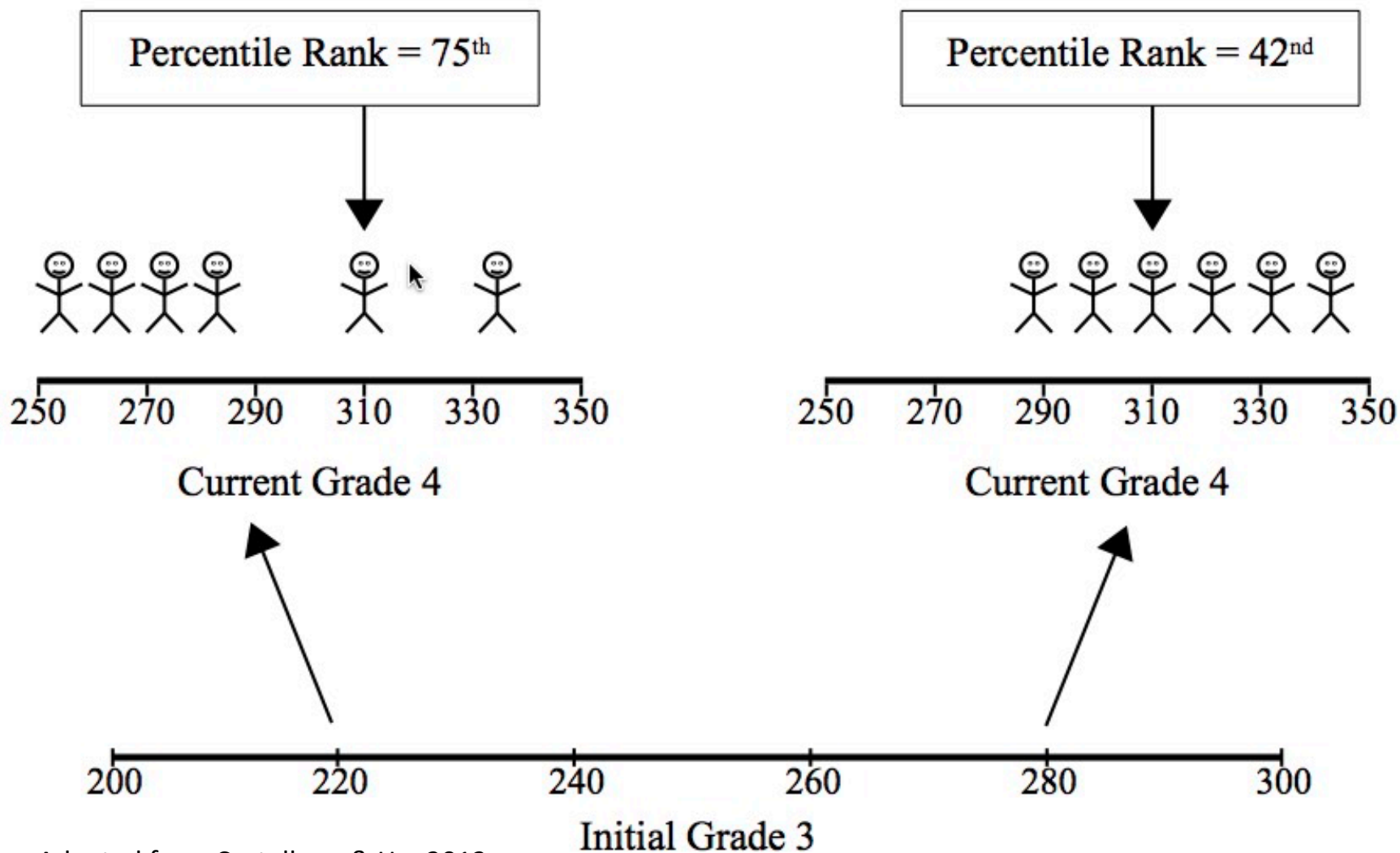
Performance Level in Grade 4			
Performance Level in Grade 3	Below Basic	Basic	Proficient
Below Basic			
Basic			
Proficient			

Source: Adapted from Castellano & Ho, 2013

Conditional Growth Percentiles

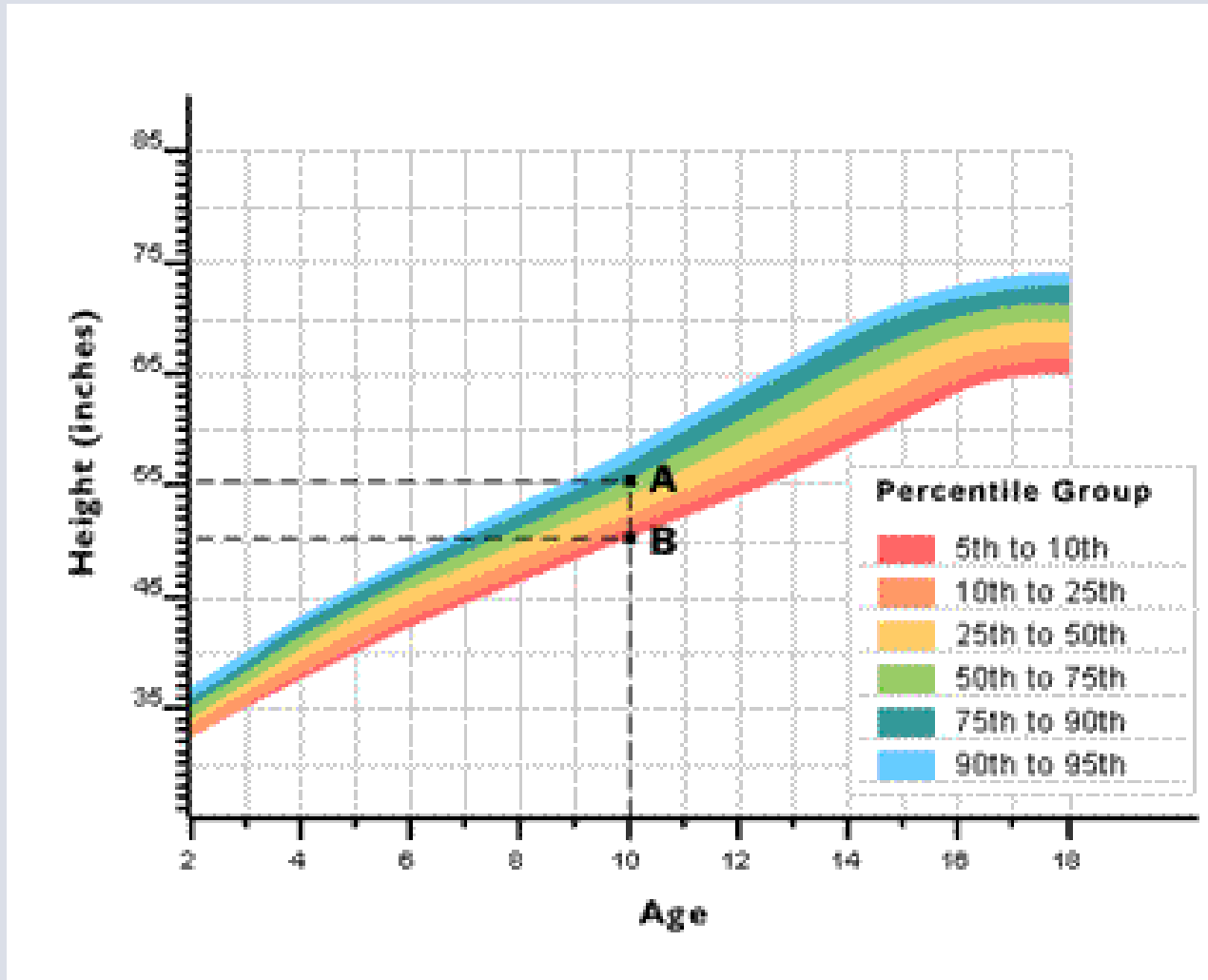
- Based on growth tables in pediatrics
- Use quintile regression
- Uses percentiles of similarly performing students
- Allows for measurement of status and growth
- Popular – in relatively wide use
- No vertical scale required
- Requires large samples

Growth Model: Conditional Growth Percentile



Source: Adapted from Castellano & Ho, 2013

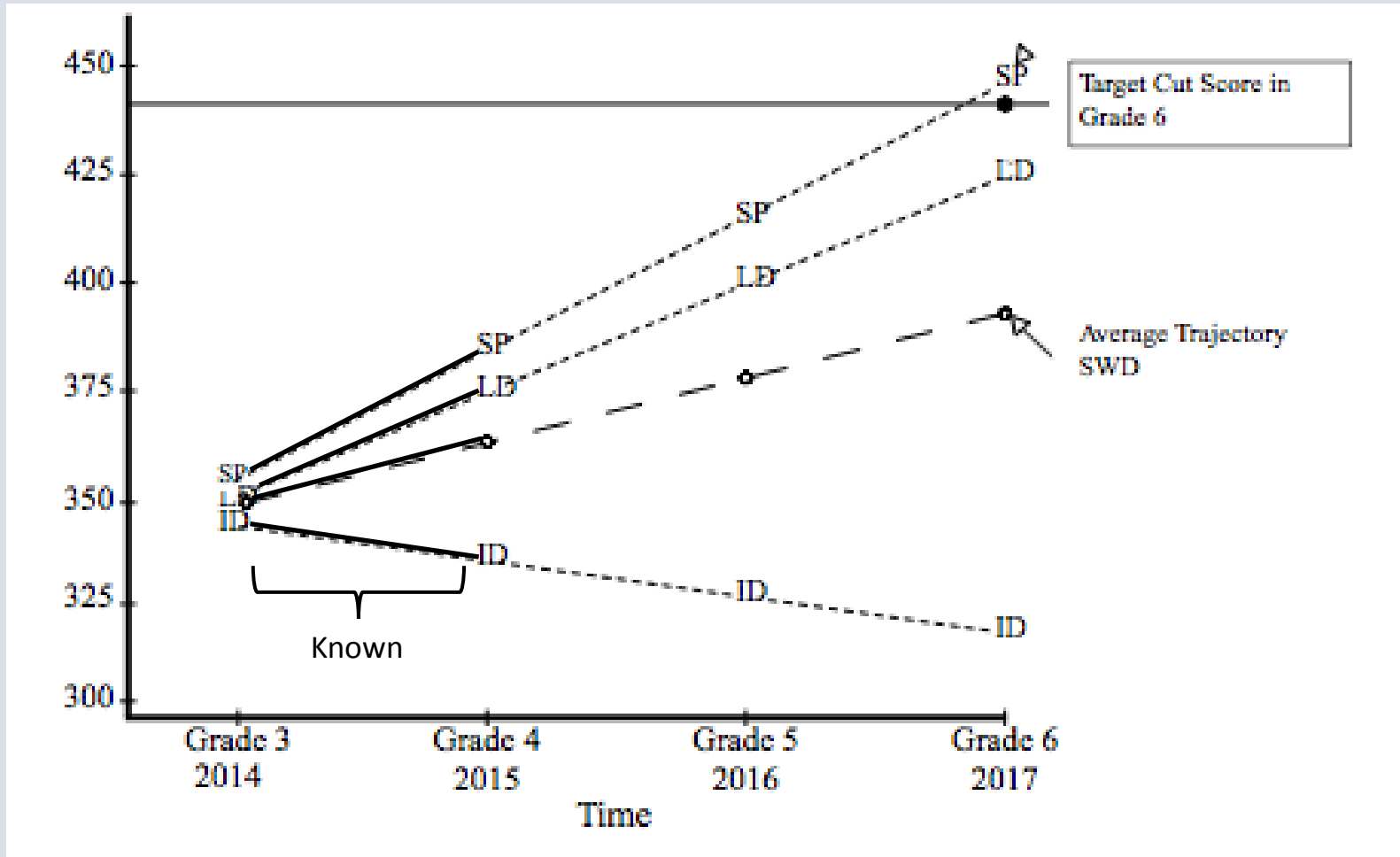
Growth Model: Conditional Growth Percentile



Small Group Activity

- At your tables, look at growth analysis handout and discuss:
 - What type of growth analysis/model does this represent?
 - What is the graph telling you?
 - How could this be used as a SiMR or to measure progress toward your SiMR?

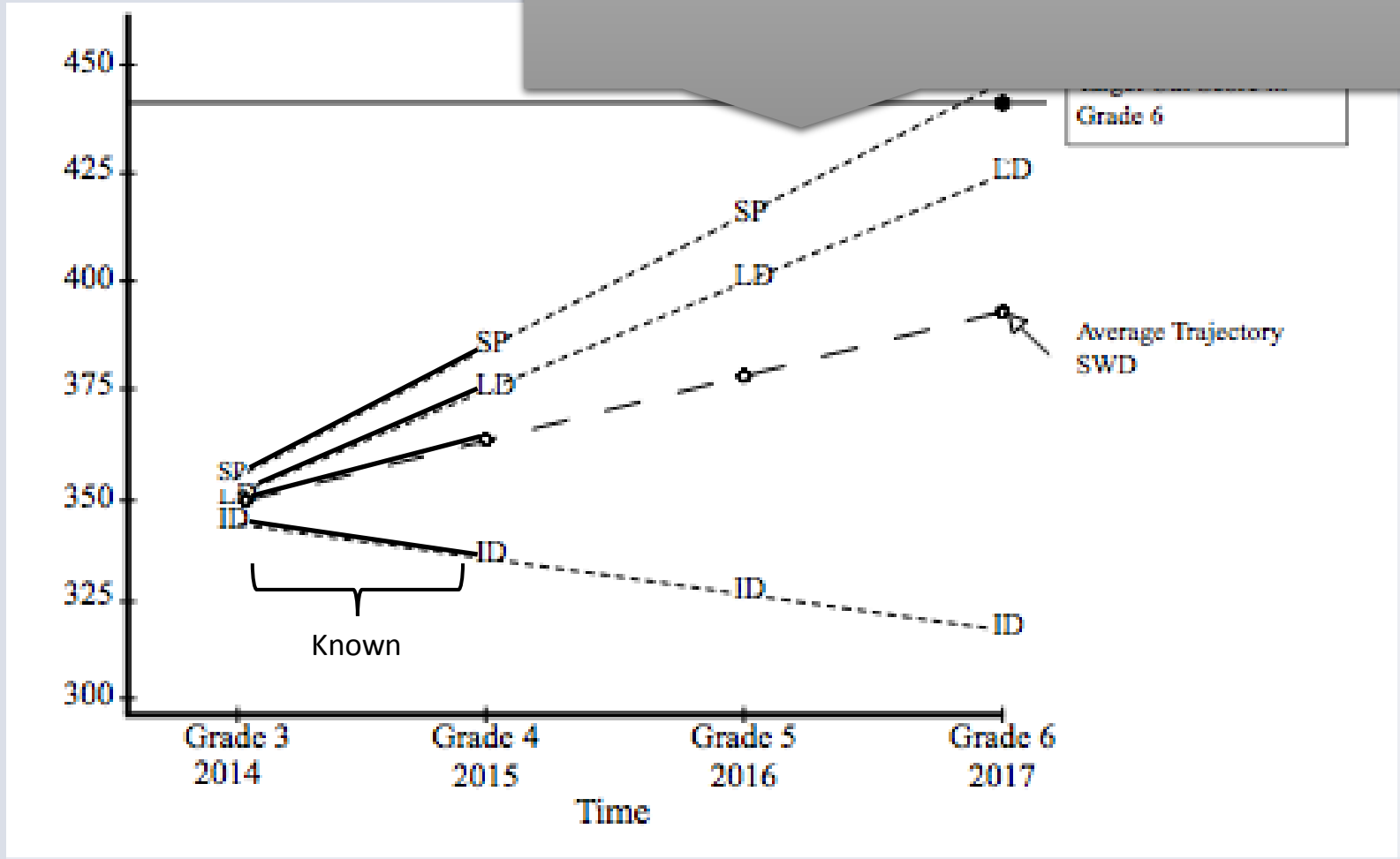
Simple Gain & Trajectory



Source: Adapted from Castellano & Ho, 2013

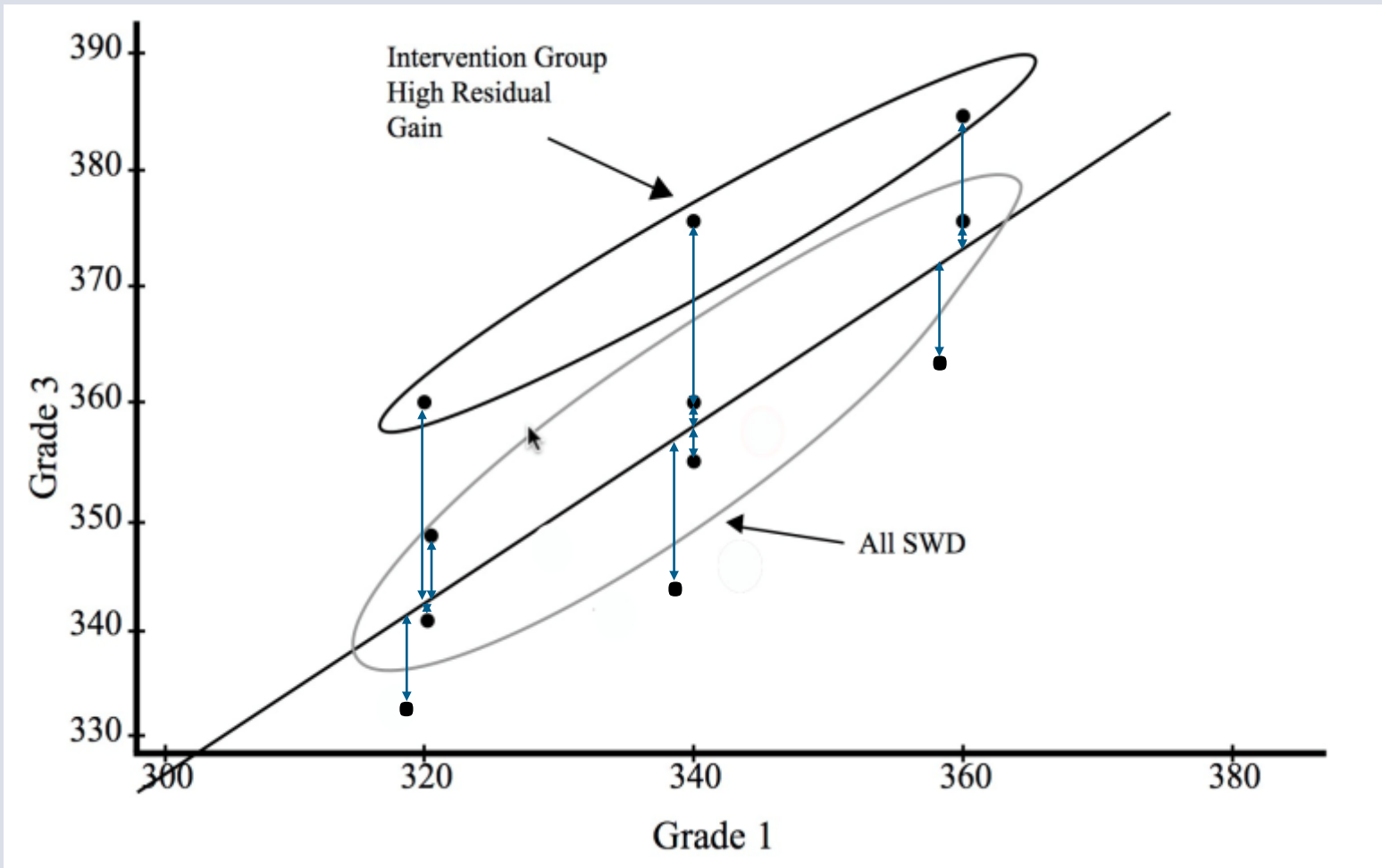
Simple Gain &

Potential SIMR/measure of progress: Increase in the percent of students with disabilities and subgroups who will reach proficiency by Grade 6.



Source: Adapted from Castellano & Ho, 2013

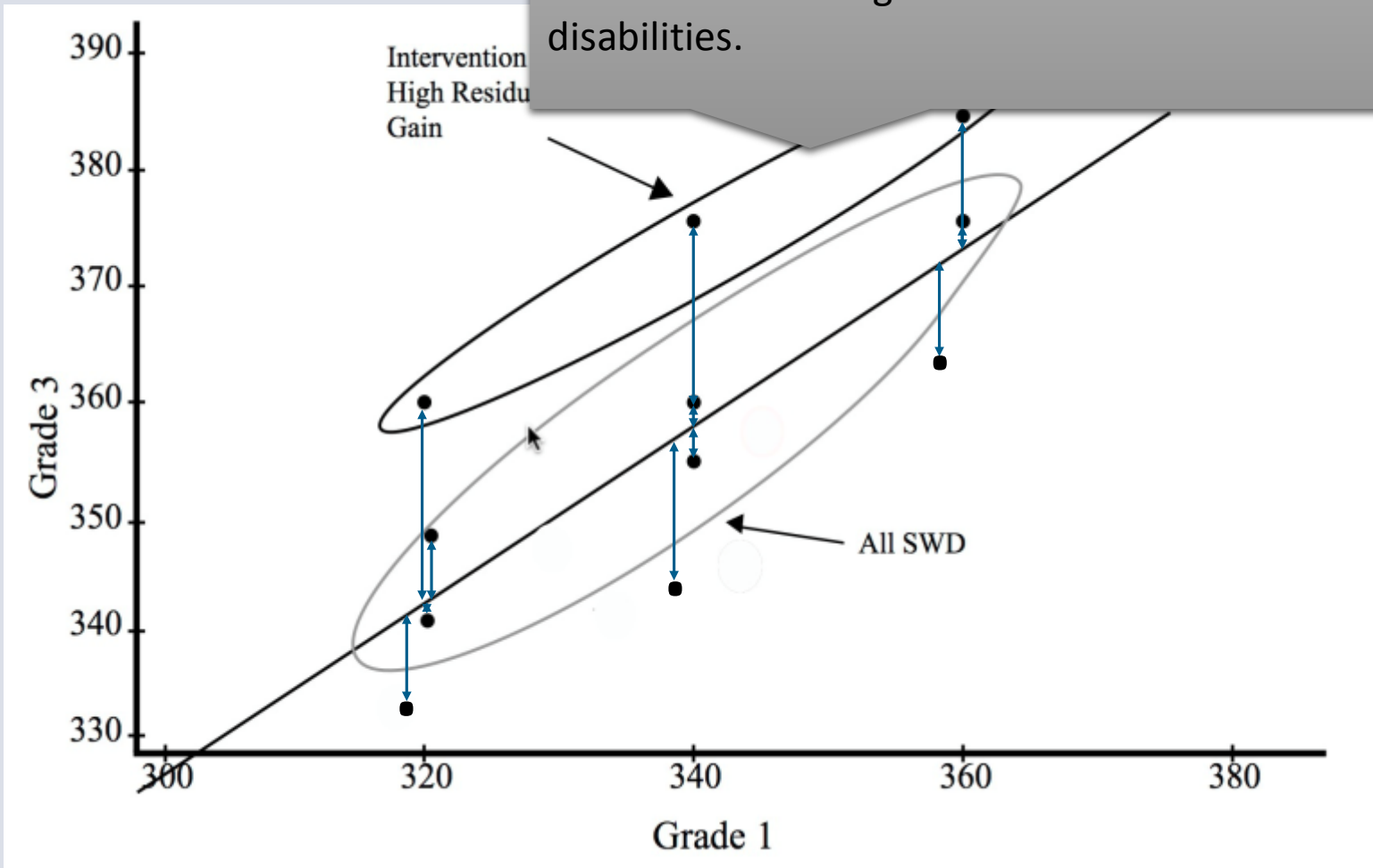
Residual Gain Model



Source: Adapted from Castellano & Ho, 2013

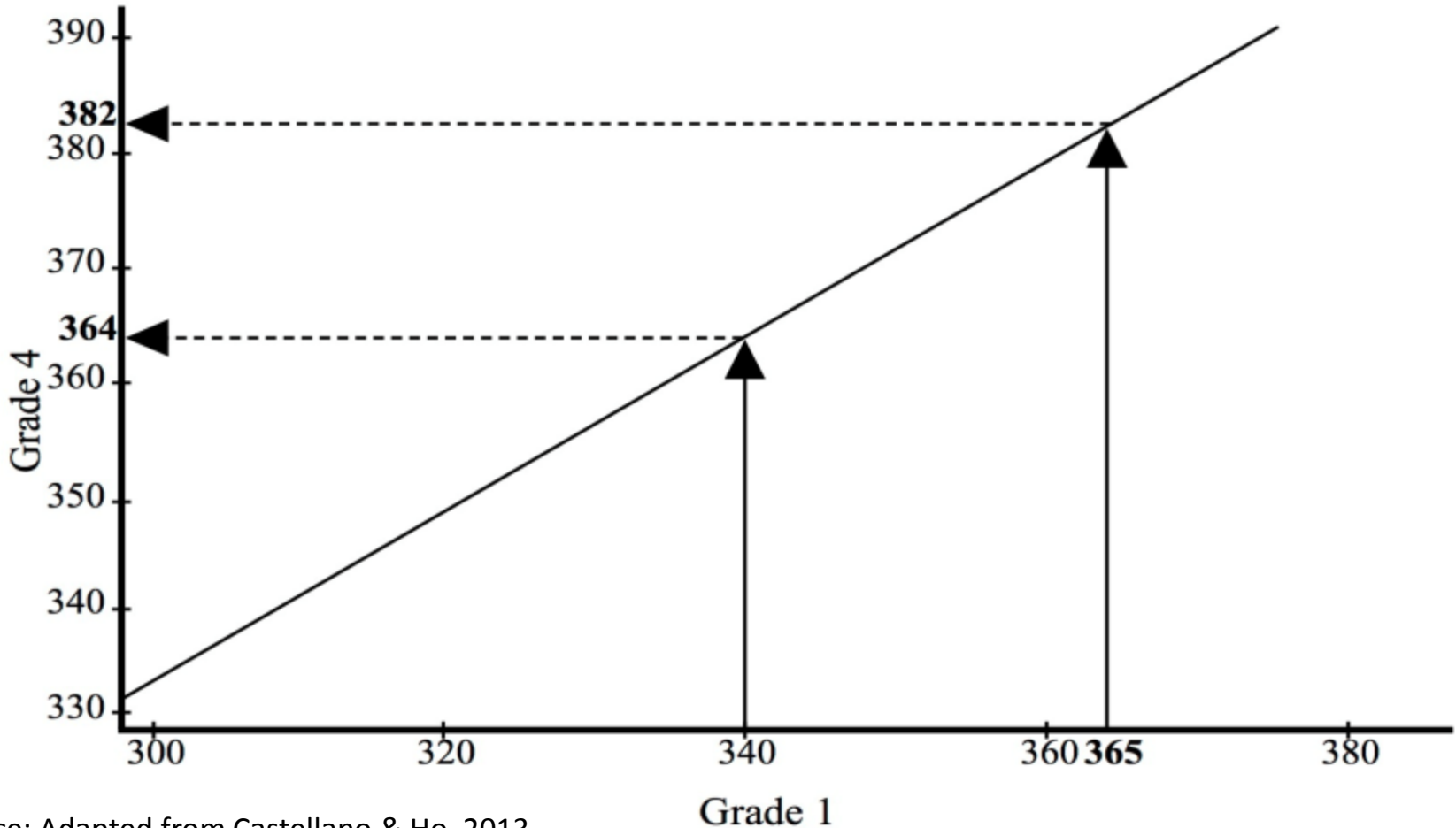
Residual

Potential SIMR/measure of progress: A greater percentage of children in the intervention/implementation sites will have increased residual gains than other children with disabilities.



Source: Adapted from Castellano & Ho, 2013

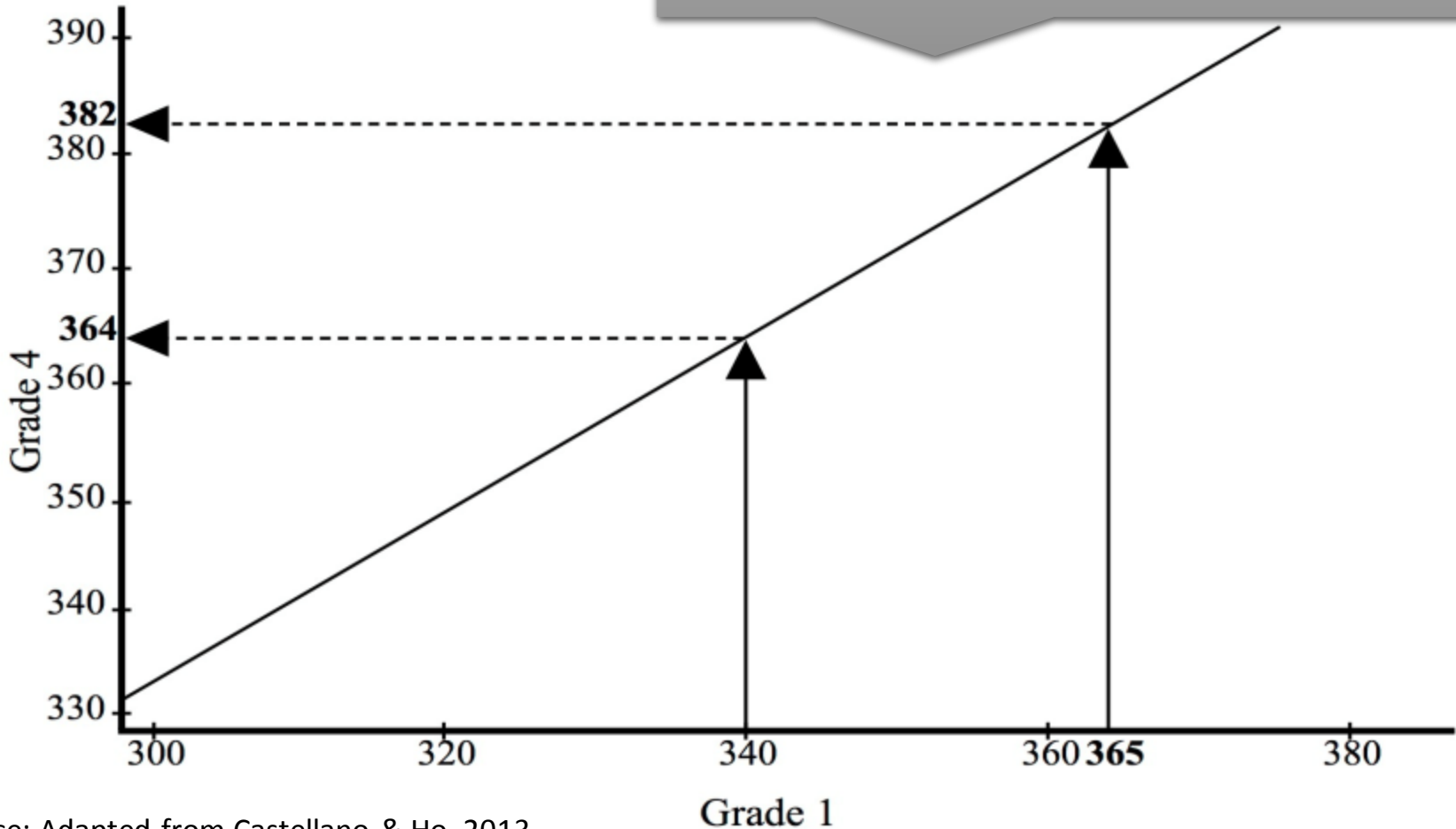
Projection Model



Source: Adapted from Castellano & Ho, 2013

Projection

Potential SIMR/measure of progress: 75% of students will achieve 1st grade score of 365 so that they will be projected to reach proficiency by grade 4.



Source: Adapted from Castellano & Ho, 2013

Value table

Distribution of Students in A School			
	Year 2 Performance Level		
Year 1 Performance Level	I	II	III
I	40	20	5
II	10	30	20
III	5	15	60



Potential SIMR/measure of progress: 30% of students in the intervention group in performance levels I and II will move up to a higher proficiency level.

Distribution of Students in A School

Year 1 Performance Level	Year 2 Performance Level		
	I	II	III
I	40	20	5
II	10	30	20
III	5	15	60

Conditional Growth Percentile Model

SCHOOLview® Changing Conversations® about school performance and educational resources

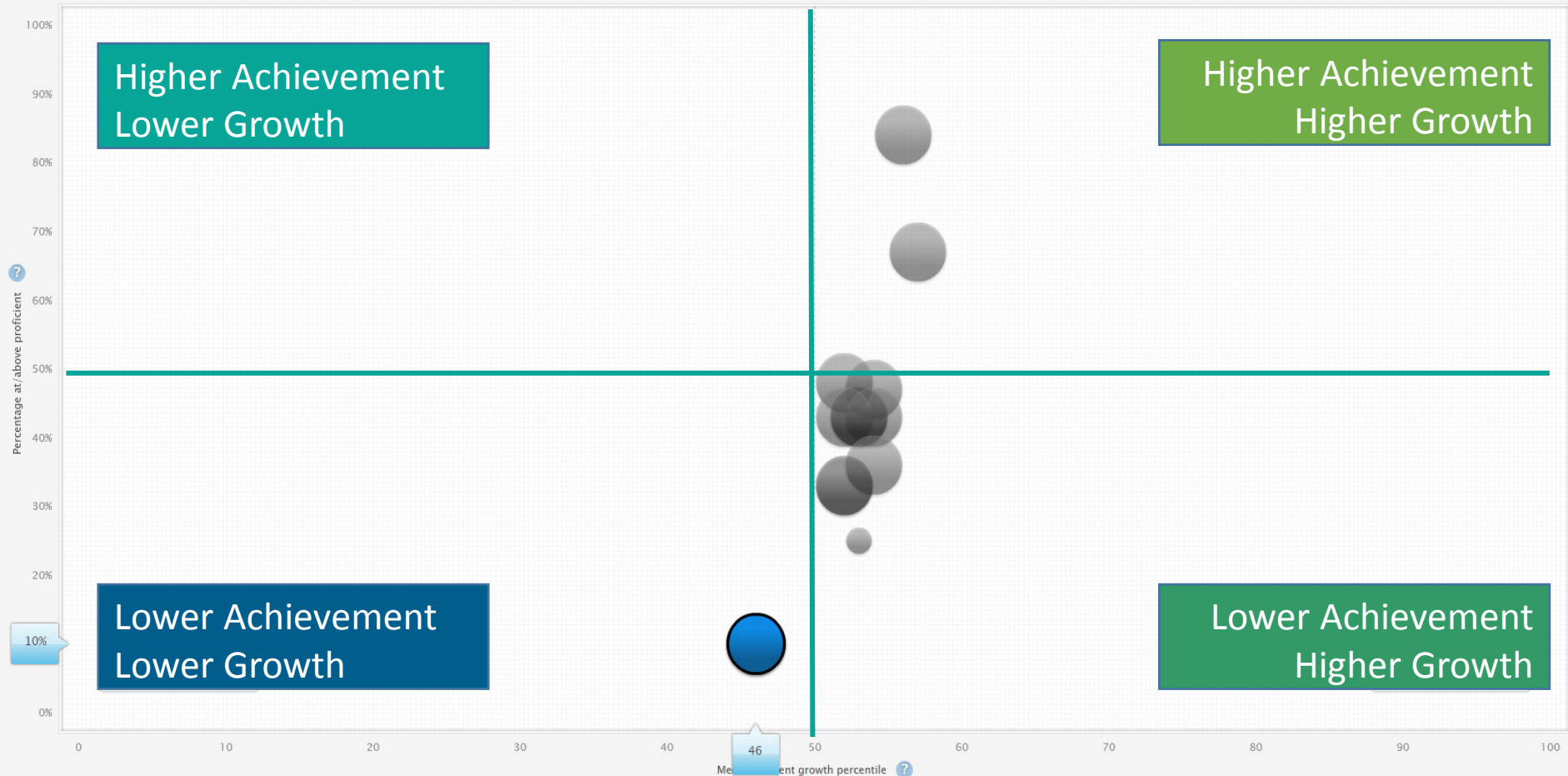
Performance Map View Share Explore Discover

District: Denver County 1

By Student Group

Enable Bubble Labels

Math Reading Writing
2012



Conditional Gro

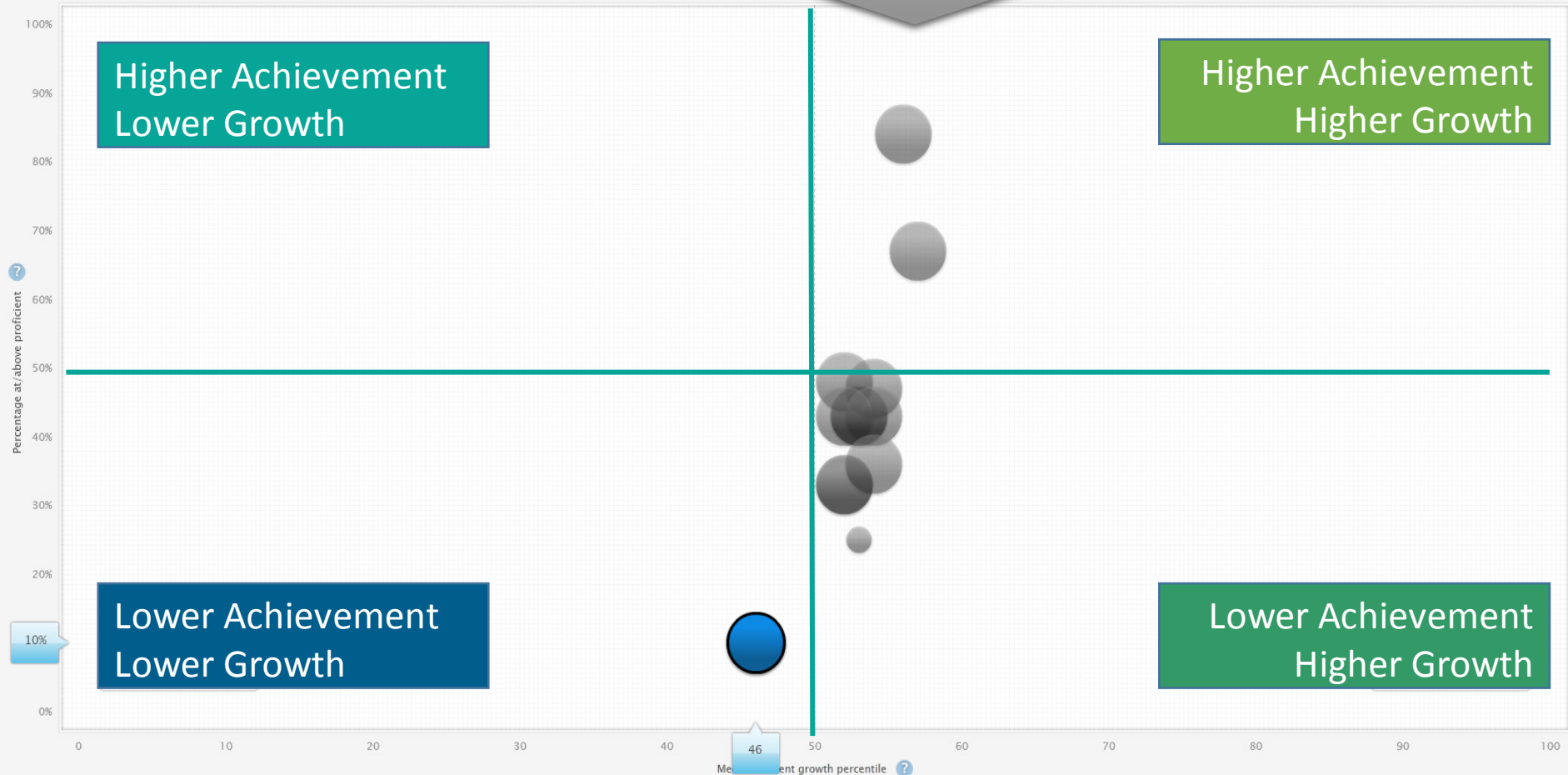
Potential SIMR/measure of progress: Greater percentages of children with disabilities will fall into the moving up and the catching up categories.

SCHOOLview[®] Changing Conversations[®] about school performance and educational resources

Performance Map View Share Explore Discover

District: Denver County 1

By Student Group



Resources

- **IDC WHITE PAPER COMING SOON!** Growth Models and SSIP: A Guide for States
- National Center on Assessment and Accountability in Special Education (NCASE-<http://www.ncaase.com>) – U of O, AZ State
- Castellano, D.E., & Ho, A. (2013). *A practitioner's guide to growth models*. Washington, DC: Council of Chief State School Officers.
- Buzick, H.M., & Laitusis, C.C. (2010). Using growth for accountability: measurement challenges for students with disabilities and recommendations for research. *Educational Researcher*, 39(7), 537–544.
- NASDE - <http://www.nasdse.org/>
- CCSSO - <http://www.ccsso.org/>

Conclusions

- Growth models can be useful for students with disabilities than status models, depending on question and decisions to be made.
- NCLB one-fit-all goal for students with disabilities may ignore the categories differences.
- Technical challenges remain.
- But there's a lot to work with.

Group Activity – Growth Scenarios

- What domain/outcome have you selected (reading, math, social emotional)?
- What populations are you focusing on?
- What data either exist or would need to exist?
- What is your basis of comparison?
- What is your SIMR?
- What growth model might work (trajectory, projection, value table, CGP)?

Staying in Touch

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