

The Michigan Top-to-Bottom Rankings and The “GAP” Index

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Stuff I Plan on Talking About

- 1) Converting scores to z-scores is not always appropriate.
- 2) Within-school gaps and school-level achievement ARE strongly related, but in a directly opposite direction, for the MEAP and the MME.
- 3) The method used to “scale” tests (turning raw scores into scale scores) can have a dramatic effect on the type of schools – low or high achieving – identified as having the largest gaps.
- 4) Not too sure that the Good-Getting-Greater classification will help specially configured schools get off the focus school list is.

Converting to Z-Scores

For Each Subject/Grade/Test Type (and Grad Rates):

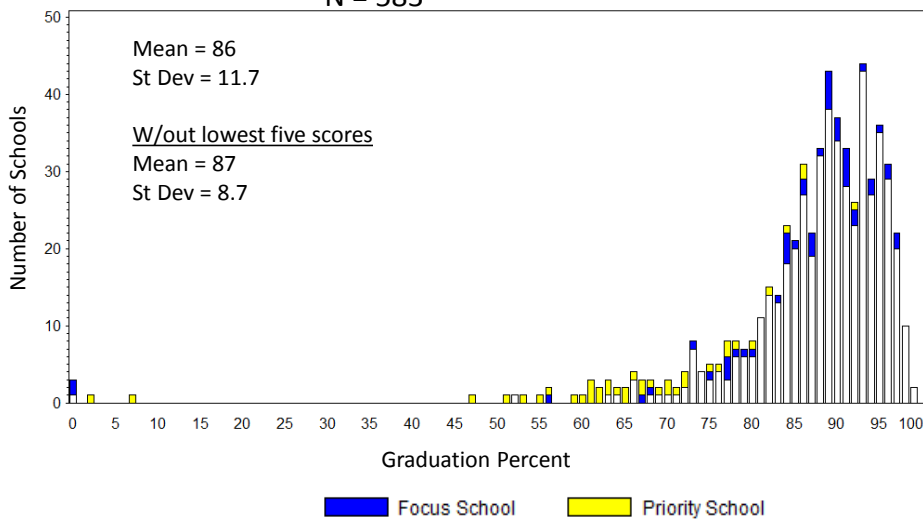
1) Compute the MEAN and STANDARD DEVIATION of the distribution

2) Subtract each student's score from this mean, then divide by the standard deviation

- This works well when the distribution is fairly well normally distributed.
- How far from "fairly well normally distributed" is it ok to compute z-scores?
 - Depends on what you plan on doing
 - Things tend to fall apart when the distribution is far from normal

Top-To-Bottom High School Graduation

N = 583



Z Scores and the Graduation Rates

- Based on this distribution, the school with a 0 percent graduation rate gets a -8.2 z score.
 - To put this in perspective:
 - > A z-score of -2.0 represents a Percentile Rank of 2.25
 - > A z-score of -8.2 represents a Percentile Rank of 0.00000000000000017 -- 17 *quadrillionths*
 - > The school's ACTUAL Percentile Rank: 0.3
- When you then attempt to combine this z-score with z-scores from other distributions, what do you think happens?
 - Does this seem *reasonable*?

Additional Notes on the Top-To-Bottom High School Graduation Rate

- one of the Schools with a Zero Graduation Rate is a Genesee ISD Center-based program
- This school serves only the most severely cognitively impaired students (administers only the Mi-Access Supported Independence and Participation assessments)
- Based on **Michigan Merit Curriculum High School Graduation Requirements**, this school CAN NOT award "regular" diplomas
- The rules for identifying Focus Schools (in addition to the schools with the "largest gap"):
 - Add any schools who have a graduation rate below 60 for three years*
 - So, this school is identified as a Focus School, base on "graduation rate"

As a Z-Score *Frame of Reference*

<u>Z-</u> <u>Score</u>	<u>Percentile</u> <u>Rank</u>
-4.0	00.003
-3.0	00.1
-2.0	2.3

<u>Z-</u> <u>Score</u>	<u>Percentile</u> <u>Rank</u>
-1.0	16
-0.5	30
0.0	50
0.5	69
1.0	84

<u>Z-</u> <u>Score</u>	<u>Percentile</u> <u>Rank</u>
2.0	97.7
3.0	99.9
4.0	99.997

*This is based on the distribution being “normal”

From Michigan’s ESEA Waiver Application

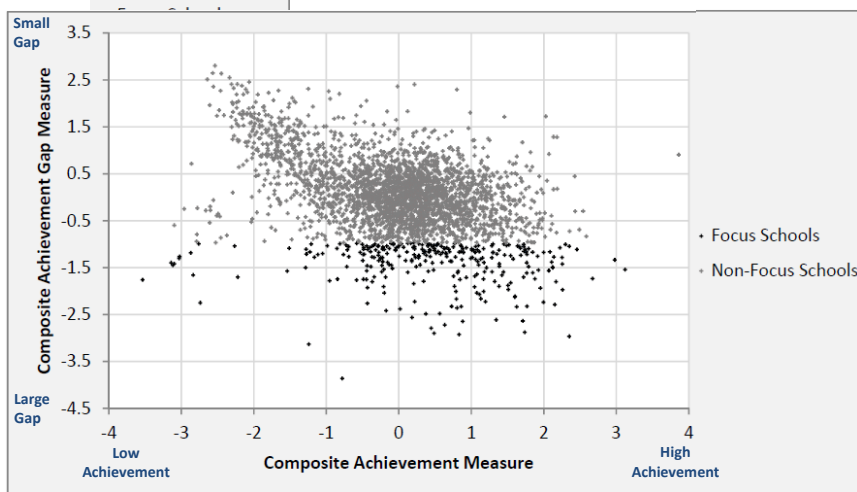
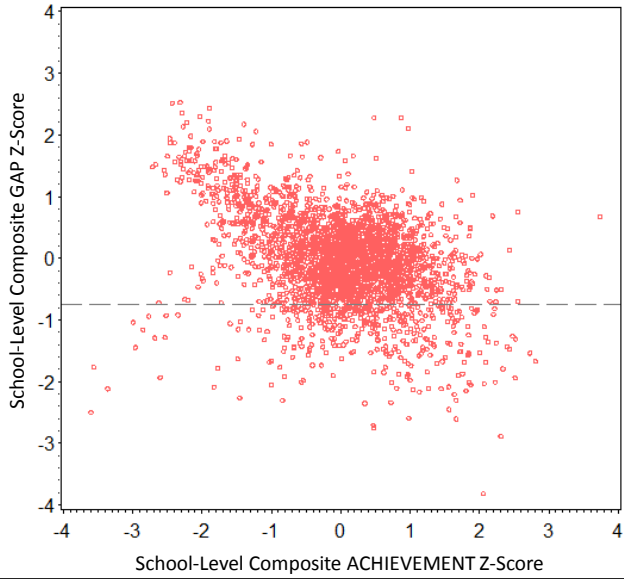


Figure 41. Distribution of Focus schools by achievement measure.

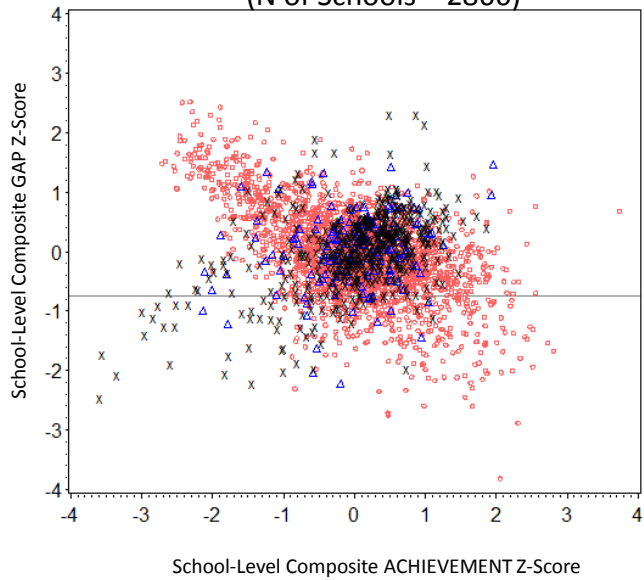
Looking at Figure 41 below, we can see that there are relatively high achieving schools with very large gaps— but there are also high-achieving schools WITHOUT large gaps. Similarly, there are lower achieving schools with large gaps as well.

- pgs 143-144 MI ESEA Waiver

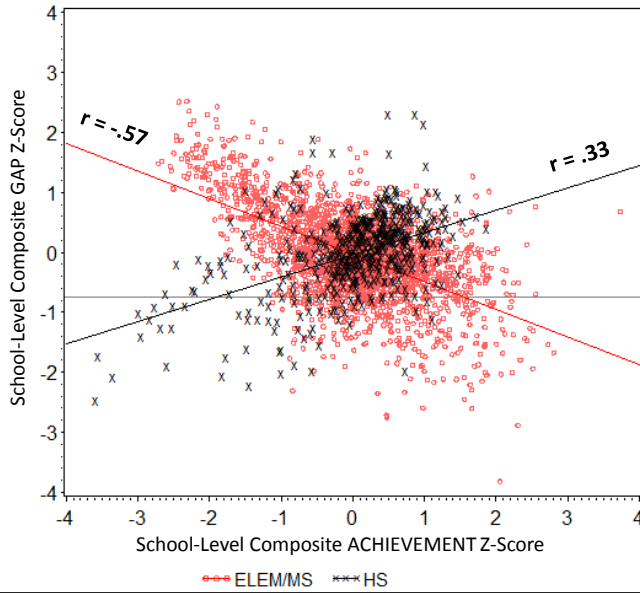
By School -- Achievement Z-Score X Gap Z-Score
All Schools -- Current Data
(N of Schools = 2866)



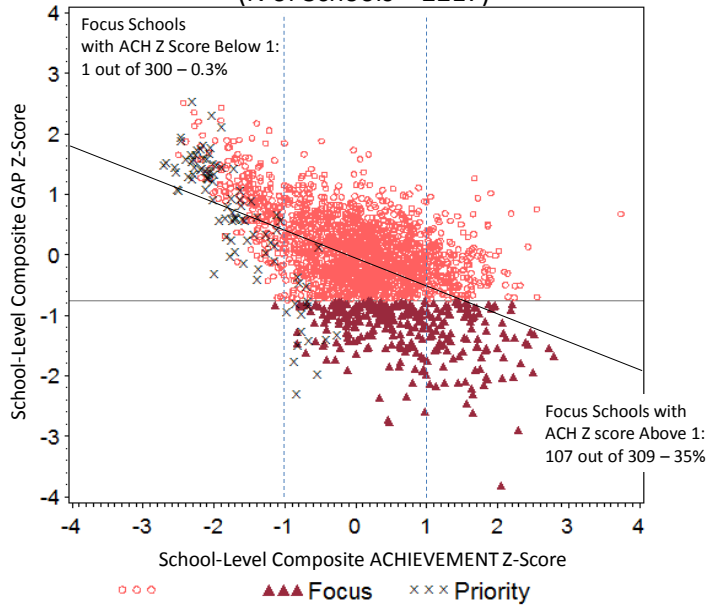
By School -- Achievement Z-Score X Gap Z-Score
WITH School Grade Levels (test type)
(N of Schools = 2866)

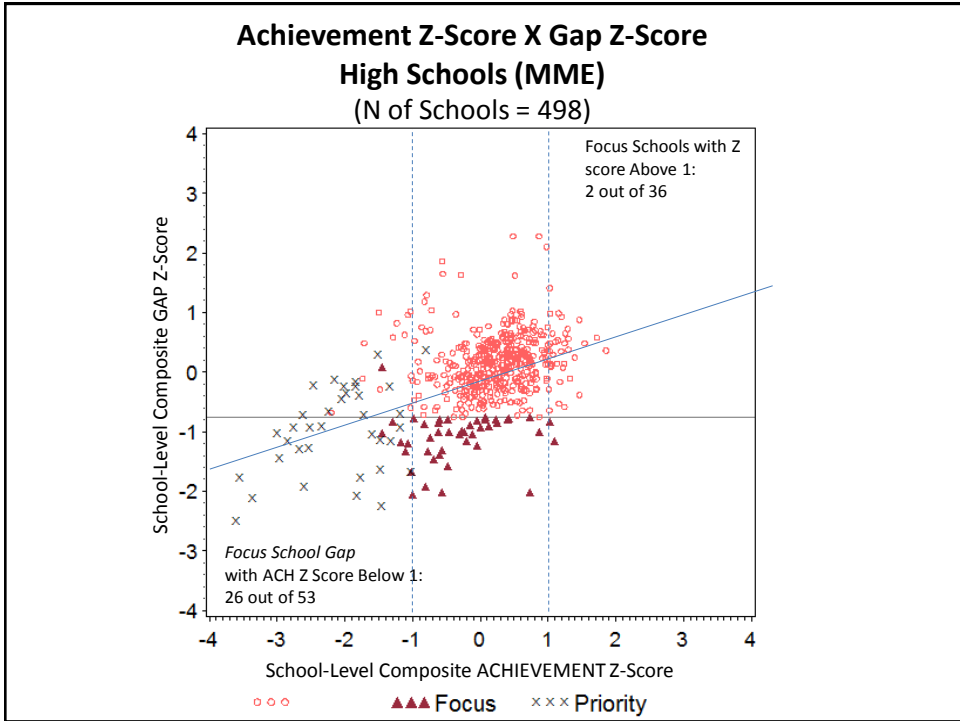


**By School -- Achievement Z-Score X Gap Z-Score
WITH School Grade Levels
(N of Schools = 2866)**



**Achievement Z-Score X Gap Z-Score
ELEM/MS (MEAP)
(N of Schools = 2217)**





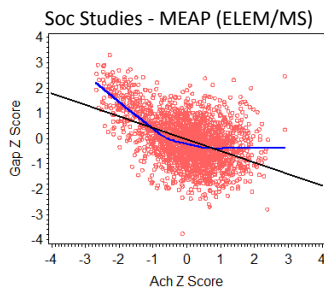
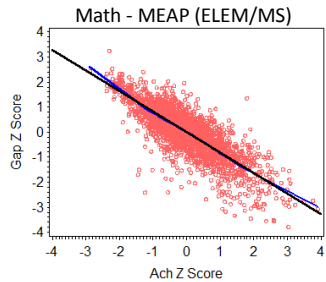
Relationship (correlation) Between Achievement and Gap, by Subject Area and Test Type

	<u>Math</u>	<u>Reading</u>	<u>Science</u>	<u>Writing</u>	<u>Soc Studies</u>
ELEM/MS (MEAP)	-.81	-.21	-.56	-.46	-.47
High School (MME)	.78	.36	.66	.47	-.79

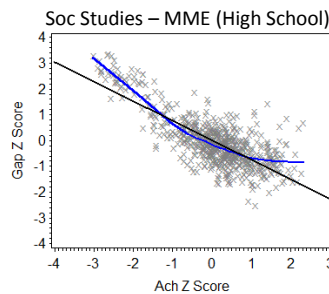
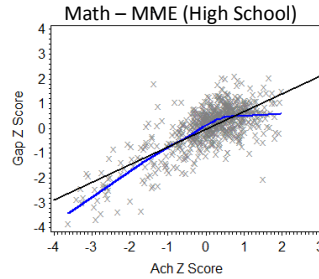
- In General,
 - Negative correlation:
 - Schools with **high** achievement have a **large** gap
 - Schools with **low** achievement have a **small** gap
 - Positive correlation:
 - Schools with **high** achievement have a **small** gap
 - Schools with **low** achievement have a **large** gap
- The larger the correlation, the more the relationship holds true.

Achievement and Gap, by Subject Area and Test Type

ELEM/MS Math & Soc Studies



High School Math & Soc Studies



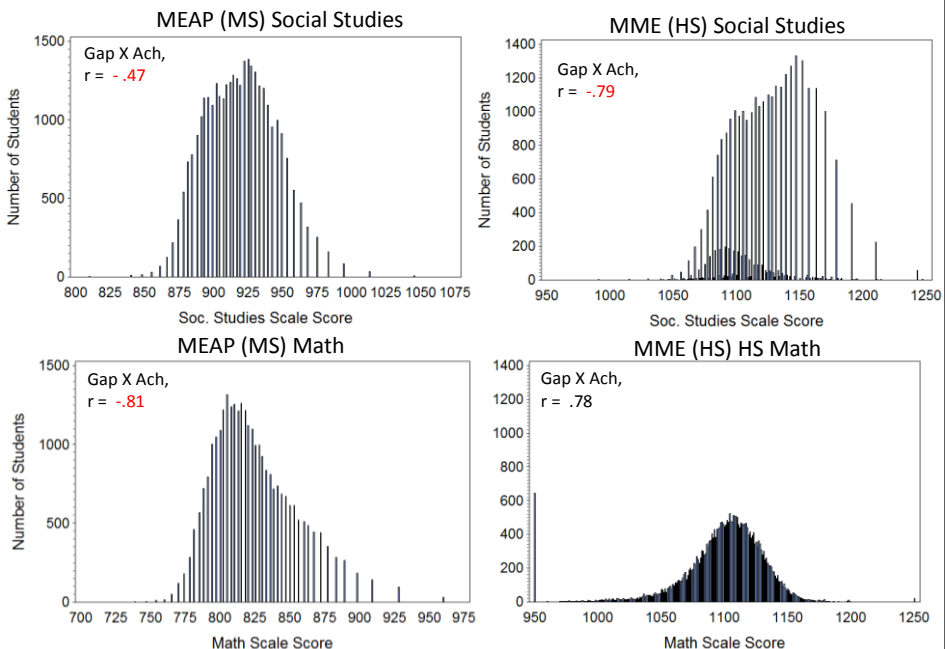
What Might Explain the Dramatic Difference in the Achievement/Gap Relationship, Across Subjects and Test Types?

- The MEAP tests are scaled using 1 Parameter IRT (Rasch)
 - *The MEAP tests show a moderate to strong NEGATIVE relationship between Achievement and Gap measures*
 - > the higher the achievement, the larger the gap
- The MME tests are scaled using 3 Parameter IRT – all except the HS Social Studies test
 - *The MME Math, Reading, Science, and Writing tests show a moderate to strong POSITIVE relationship between Achievement and Gap measures*
 - > the lower the achievement, the lower the gap
 - *The MME Soc Studies test shows the same relationship as the MEAP tests*
 - > the higher the achievement, the larger the gap

What Might Explain the Dramatic Difference in the Achievement/Gap Relationship, Across Subjects and Test Types?

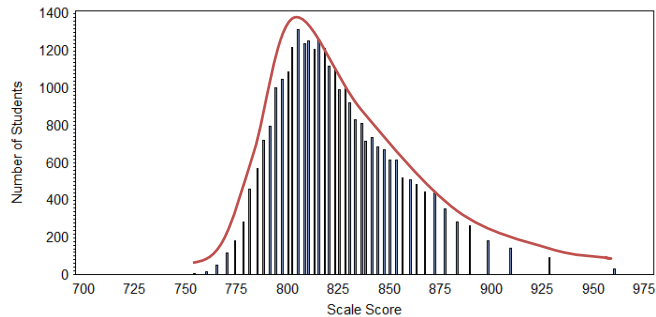
- Both methods have difficulty estimating the extreme ends of the distributions
 - the MEAP tests (and MME Soc. Studies test) tend to “stretch out” the right side of the distribution (high achieving students)
 - the MME tests tend to “stretch out” the left side of the distribution (low achieving students)

Which Distribution Looks Different? (Genesee, Lapeer, Oakland, & Macomb Counties)

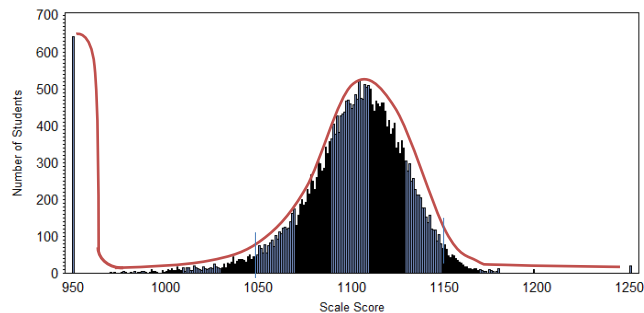


Math Scale Score Distributions– Genesee, Lapeer, Oakland, & Macomb Counties
(Number of Students per Grade ≈ 29,000)

**Grade 8
MEAP**



**Grade 11
MME**



Investigating the relationship between the Gap and Achievement Z-Scores, on the Middle School MEAP and High School MME, Across Subjects

A small study:

- Identify the Districts that have either 1) a Single Middle School and a Single High School or 2) a Single MS/HS Building
 - With MS grades 7 & 8 only (to look at only 8th grade MEAP & 9th grade Social Studies)
- Examine the results of the MS MEAP (Grade 8 MEAP & Grade 9 Social Studies) and HS MME (gr. 11 MME) – looking at the relationship, between districts/subjects, at the Middle School & High School

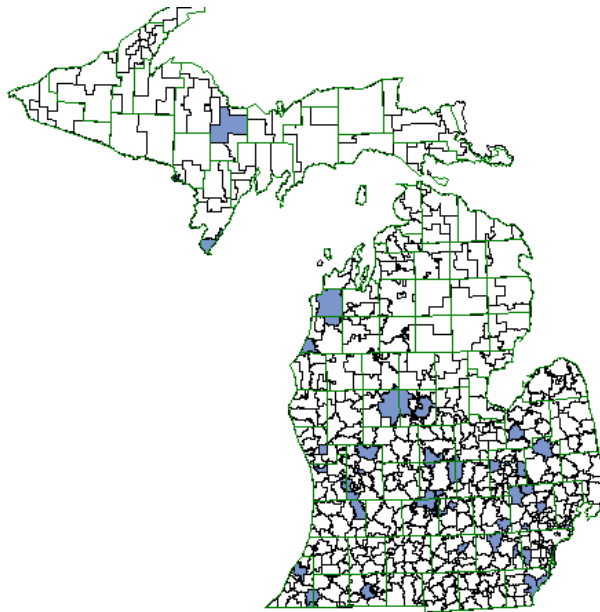
**Number of Districts with 1 MS & 1 HS*
or Single MS/HS Building
(MS grade spans: 7 & 8)**

	Frequency	Percent	Cumulative Frequency
1 MS & 1 HS	50	60	50
Single MS/HS Building	34	40	84

- Counts only include districts that have GAP & Achievement Z's at both the Elem/MS and HS levels
- Schools with grades 7 & 8 based on the GradeList field in the TTP file

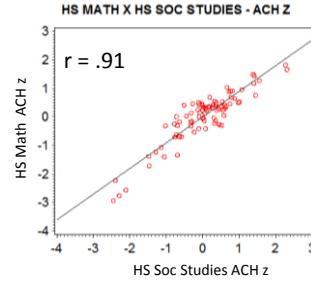
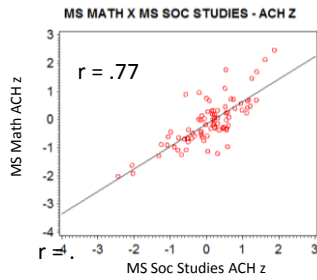
*after taking out Alternative Ed. Buildings

Districts with 1 MS & 1 HS or a Single MS/HS Building

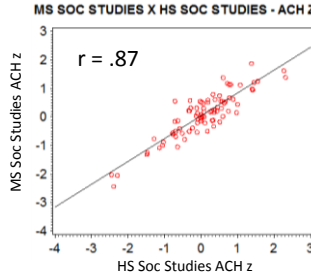
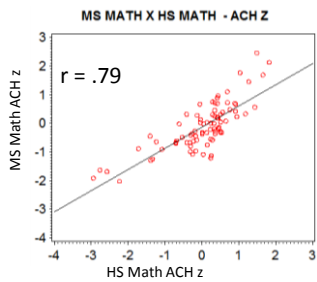


The relationship in achievement is what one might expect:

Within Grade Level, Across Subjects

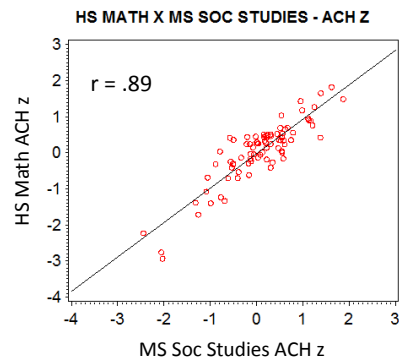
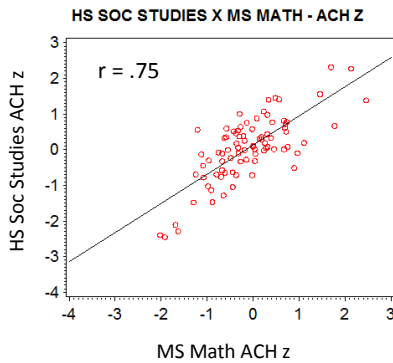


Across Grade Level, Within Subjects



The relationship in achievement is what one might expect:

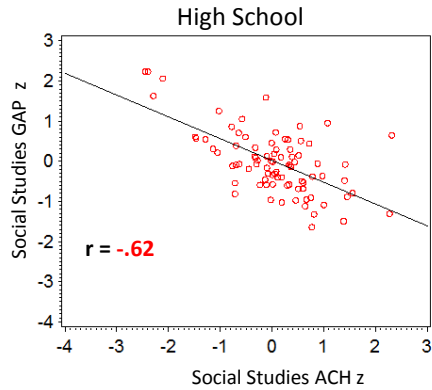
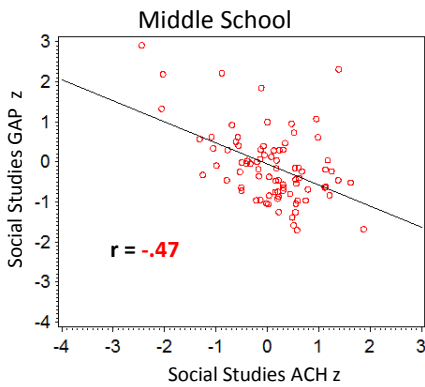
Across Grade Level, Between Subjects



The relationship across Districts, Between Achievement and Gap, for Social Studies, stays relatively consistent from Middle School to High School

Social Studies

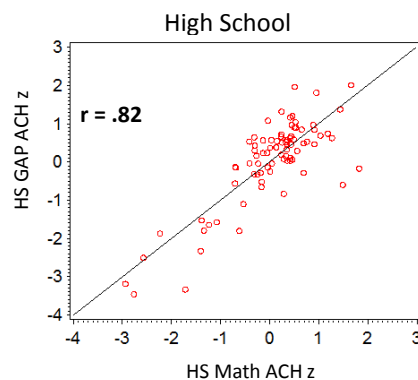
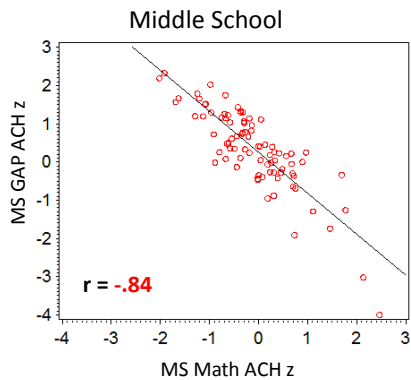
Achievement Z-score X Gap Z-score



The relationship Across Districts, Between Achievement and Gap, for Math, changes dramatically from Middle School to High School

MATH

Achievement Z-score X Gap Z-score



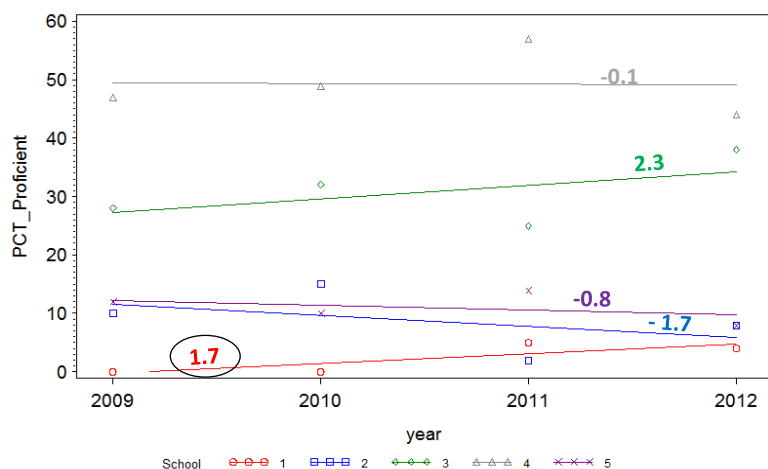
The Probability of Qualifying for “Good Getting Greater” or How “Safe” is “Safe Harbor” for Your Bottom 30%?

Good-Getting-Great -- an “exit path” from the Focus School category:

- 1) Their overall achievement level is 75% or above
(I’m pretty sure they mean at or above the 75th percentile)
- 2) Their bottom 30% (though initially low-performing) is making rapid enough progress to achieve Safe Harbor status
 - To achieve Safe Harbor, a school (or subgroup) must have an improvement *slope* equal to (or greater) than the slope of the school at the 80th percentile.

Example: Determining the Slope at the 80th Percentile

- Five Schools, each with a percent proficient at 2009 through 2012
- With five schools, the 2nd largest slope will represent the 80th Percentile (the “slope” simply means the change, from one year to the next, based on the “best fit” line)



- Based on this example, to make safe Harbor: a school (or subgroup) would need to make a 1.7% improvement, in percent proficient, from the previous year to the current year.

What would your slope need to be to make Safe Harbor?

Based on the last four years of MEAP & MME data (2008-09 –2011-12), the school at the 80th percentile:

Science

Grade 5	Grade 8	Grade 11
.98%	0.6%	2.5%

Social Studies

Grade 6	Grade 9	Grade 11
-0.3%	-.66%	1.7%

Math

MEAP, by School, All Grades Combined	Grade 11
1.5	2.2

- I'm guessing a negative slope, even at the 80th percentile, won't get you Safe Harbor

How Many Schools Have Kid's "Proficient" in Their Bottom 30%?

Schools in Michigan that have 0 percent proficient in their bottom 30%:

- Social Studies: 99.8% (8 of 1806 with pct prof > 70)
 - Science: 99.6% (7 of 2737 with pct prof > 70)
- (FROM THE 2011-12 STATE FILES (MEAP AND MME COMBINED W/IN SCHOOL)

-- These don't include "provisionally proficient"

Genesee County Results – Including Provisionally Proficient Students
(and only students who are Full Academic Year)

Students in the Bottom 30% Subgroup

Science_Prof or Prov Prof	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Not Prof - FI	37	1.26	37	1.26
Not Prof - MEAP	2910	98.74	2947	100.00

Soc_Studies_Prof or Prov Prof	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Not Proficient	2864	95.63	2864	95.63
Proficient	131	4.37	2995	100.00

Schools with ANY Bottom 30% Students Prof. or Prov. Prof

Science: 0 out of 94

Soc Studies: 17 out of 94 (18%)

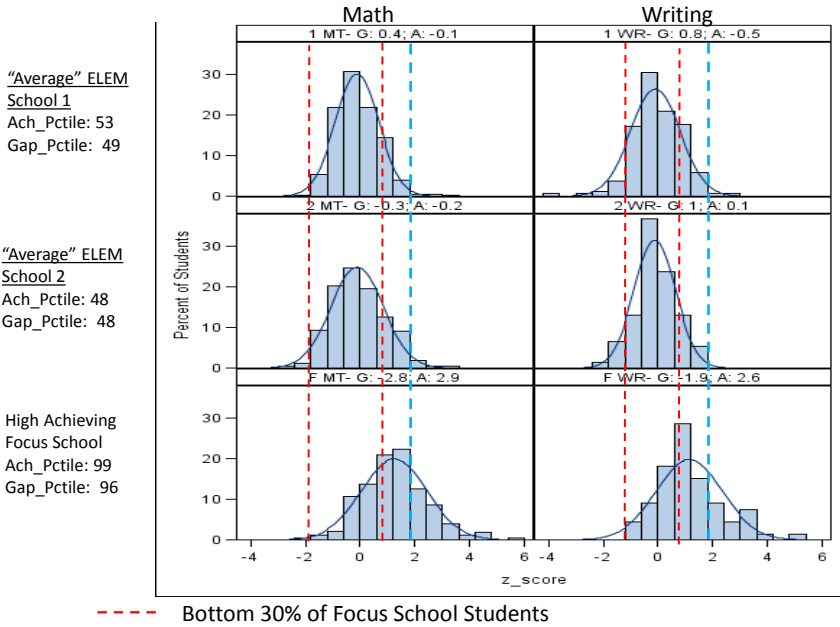
Implications for GGG

IF “achieve Safe Harbor status” for GGG Schools is defined as making Safe Harbor in all subjects... good luck!

Final Points

- No one argues that an achievement gap exists, or that something should be done to address it.
- Is focusing on within-school gaps the most appropriate (or, even AN appropriate) way to do this?

What do the Student-Level Distributions of Z-Scores Look like in a High Achieving Focus School and Two “Average” Elementary Schools?



Questions/Comments?
Thanks!