

K-12 In Alaska Investing in Effective Measures to Ensure Student Success in Life

Prepared by Mark A Foster (MAFA)

Prepared for House/Senate Education Committee Joint Meeting

April 24, 2019

Overview

- How are Alaskan Students Doing on Standardized Tests?
 - NAEP & PEAKS, 4th & 8th Grade Reading/ELA & Math
- What drives the variation in standardized test scores?
 - Poverty & Standardized Test Scores
- How do we measure effective teaching?
 - Growth & Proficiency
- Which schools have students who are performing well above expectations?
- What do local superintendents report as the key factors driving student assessments?
- What does the national/international research say?
- Recommendations for Alaska

Disclosures, Caveats & Limitations

Disclosures

1. Mark A Foster & Associates (MAFA) has been retained by Senator Von Imhof to assist in the compilation and analysis of what drives student success and what education initiatives look most promising to deliver effective, efficient and affordable education services for all Alaskan students
2. Mark Foster was appointed to fill a short term vacancy on the Anchorage School Board, Seat A (October 2018-April 2019).
3. Mark Foster served as the Director, Office of Management & Budget, and CFO for the Anchorage School District from 2012-2016. Mr. Foster was the project manager on the Evidence Based Model for ASD (April 4, 2016).
4. MAFA has consulted for a wide range of private and public sector clients across multiple sectors in Alaska, U.S. and Internationally since 1994.
5. Mark Foster graduated from Lathrop High School in Fairbanks in 1979.

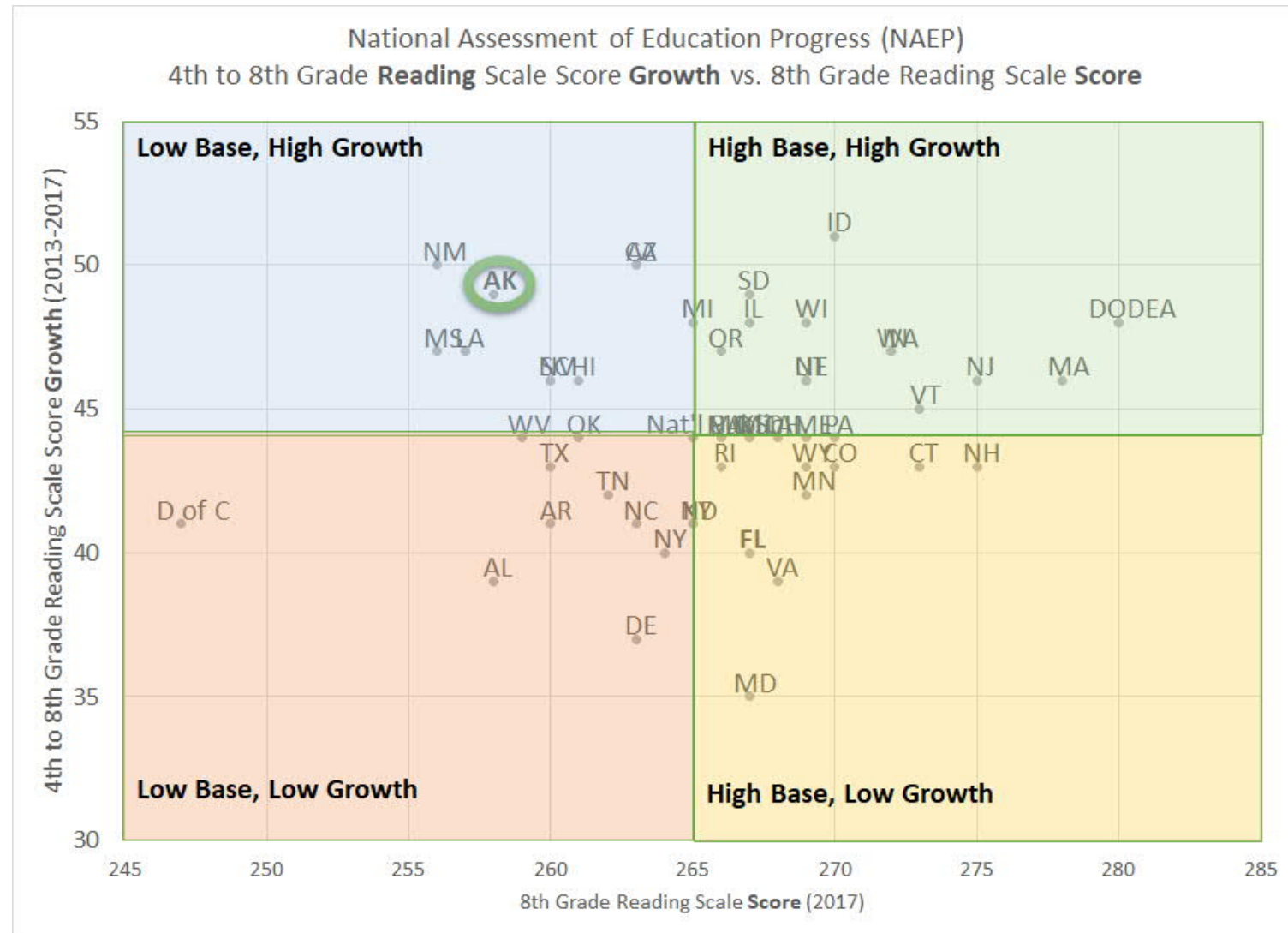
Caveats & Limitations

1. NAEP and PEAKS Standards Based Tests provide one summative approach to assessing student academic performance. Variation in student test scores are frequently correlated with poverty and related factors. The Gates Foundation Measuring Effective Teaching Project and subsequent research supports the use of student growth and proficiency as one domain to assess the value that teachers and schools contribute toward student academic success.
2. Standards Based Tests are only modestly correlated with success in life (Raj Chetty)
3. Social skills tend to be better predictors of success in life (Kirabo Jackson, Raj Chetty)

How are Alaskan Students Doing on Student Standards Based Assessments?

	4 th Grade	8 th Grade
National Assessment of Educational Progress (NAEP)		
Reading	4 th to 8 th Grade Scale Score Growth & 8 th Grade Scale Score	
Math	4 th to 8 th Grade Scale Score Growth & 8 th Grade Scale Score	
Performance Evaluation for Alaska Schools (PEAKS)		
English Language Learners	Percentage Proficient	Percentage Proficient
Math	Percentage Proficient	Percentage Proficient

K-12 Progress to Date AK Student Growth & Achievement: NAEP Reading

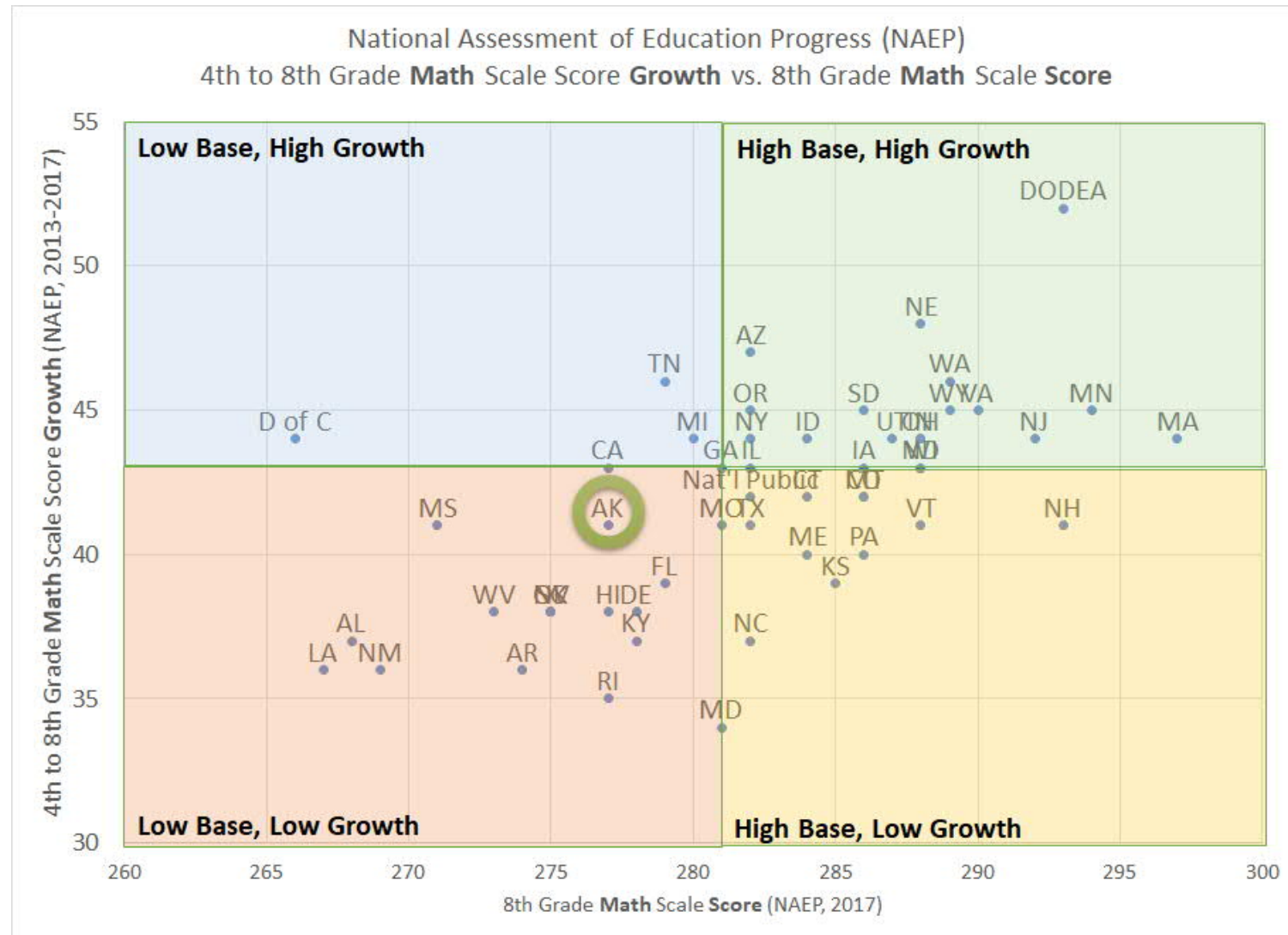


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K-12 Progress to Date AK Student Growth & Achievement: NAEP Math



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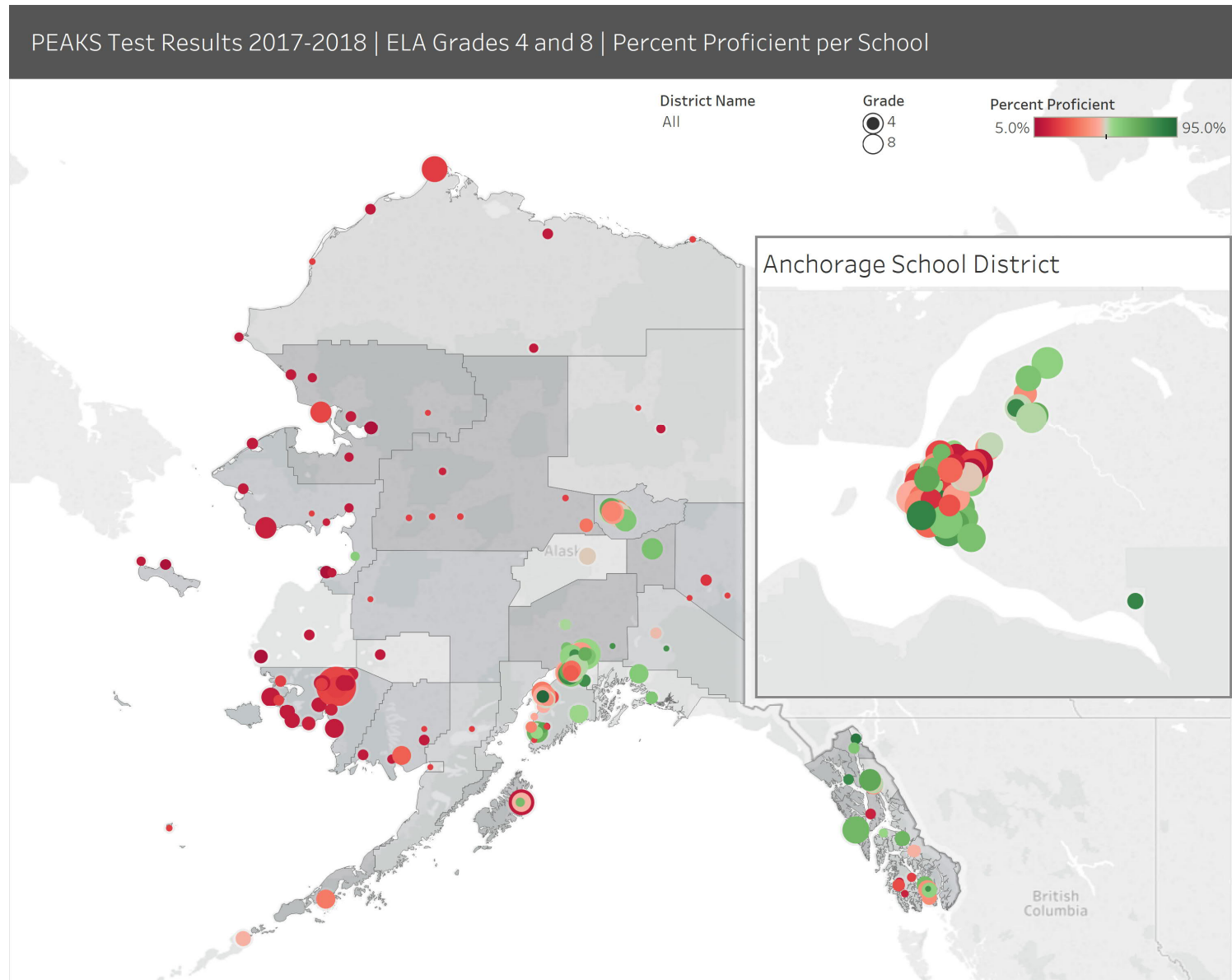
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ALASKA PERFORMANCE EVALUATION FOR ALASKAN SCHOOLS (PEAKS)

- 4th Grade English Language Arts
- 8th Grade English Language Arts
- 4th Grade Math
- 8th Grade Math

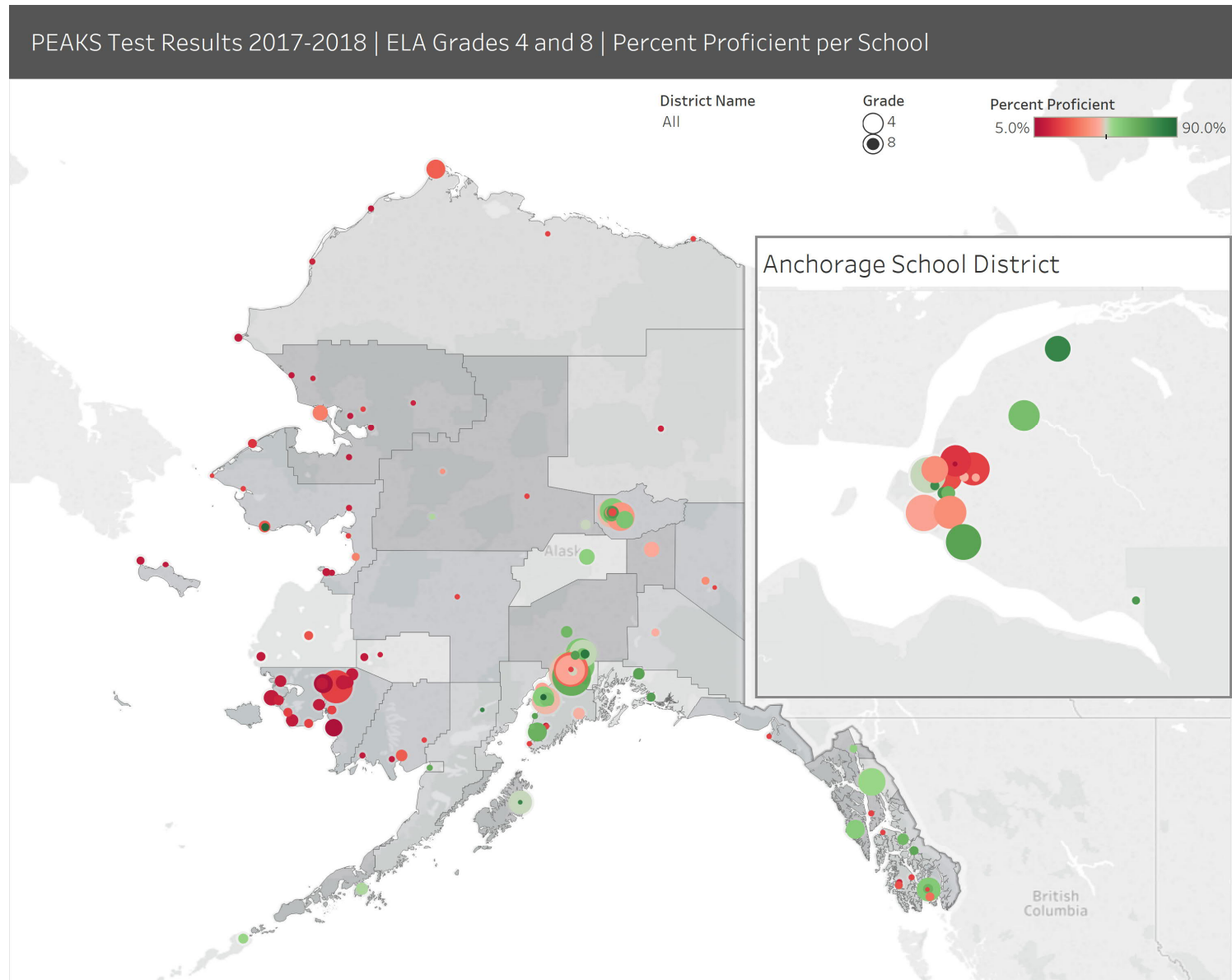
4th Grade English Language Arts

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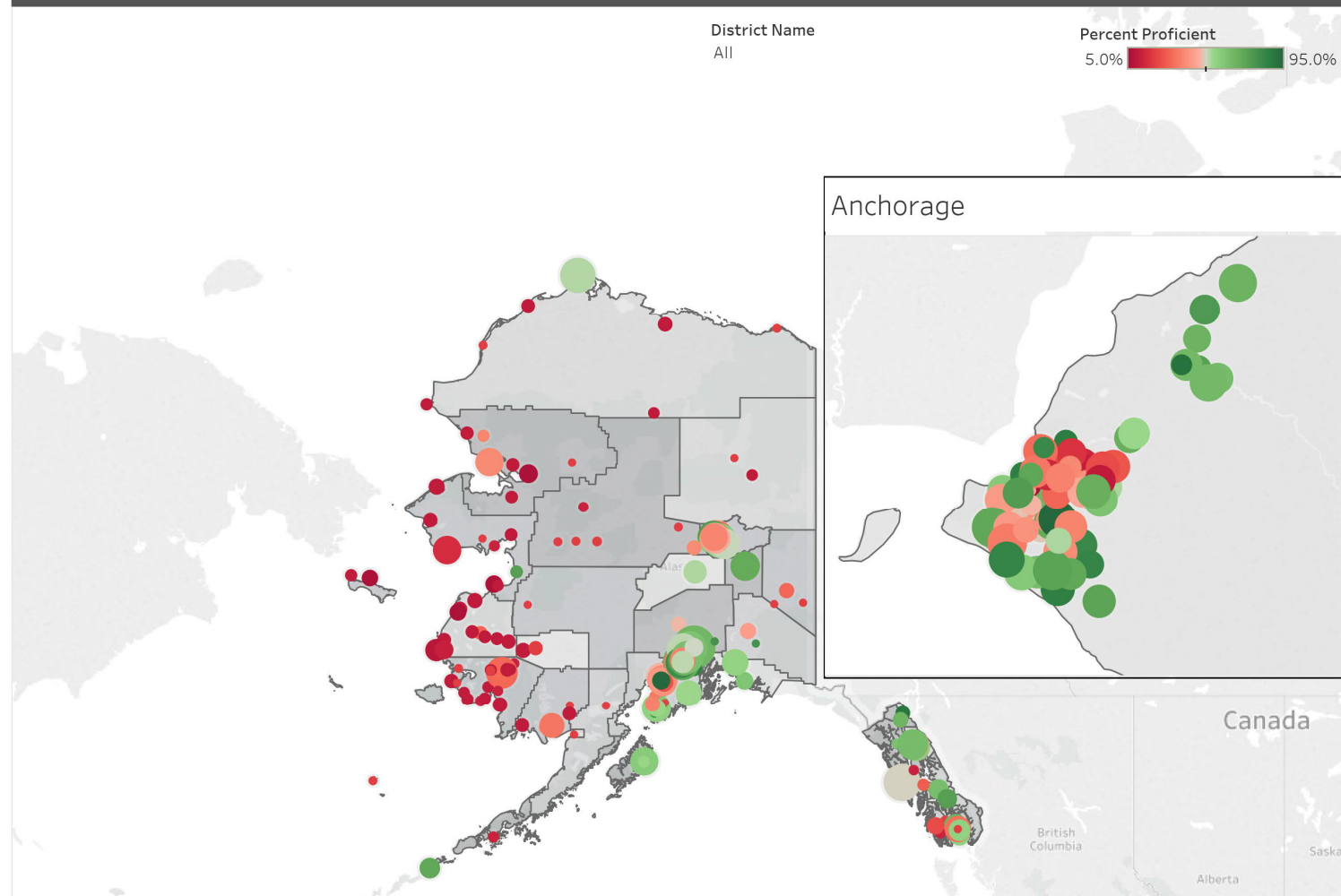
8th Grade English Language Arts

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4th Grade Math

PEAKS Test Results 2017-2018 | Math Grade 4 | Percent Proficient per School



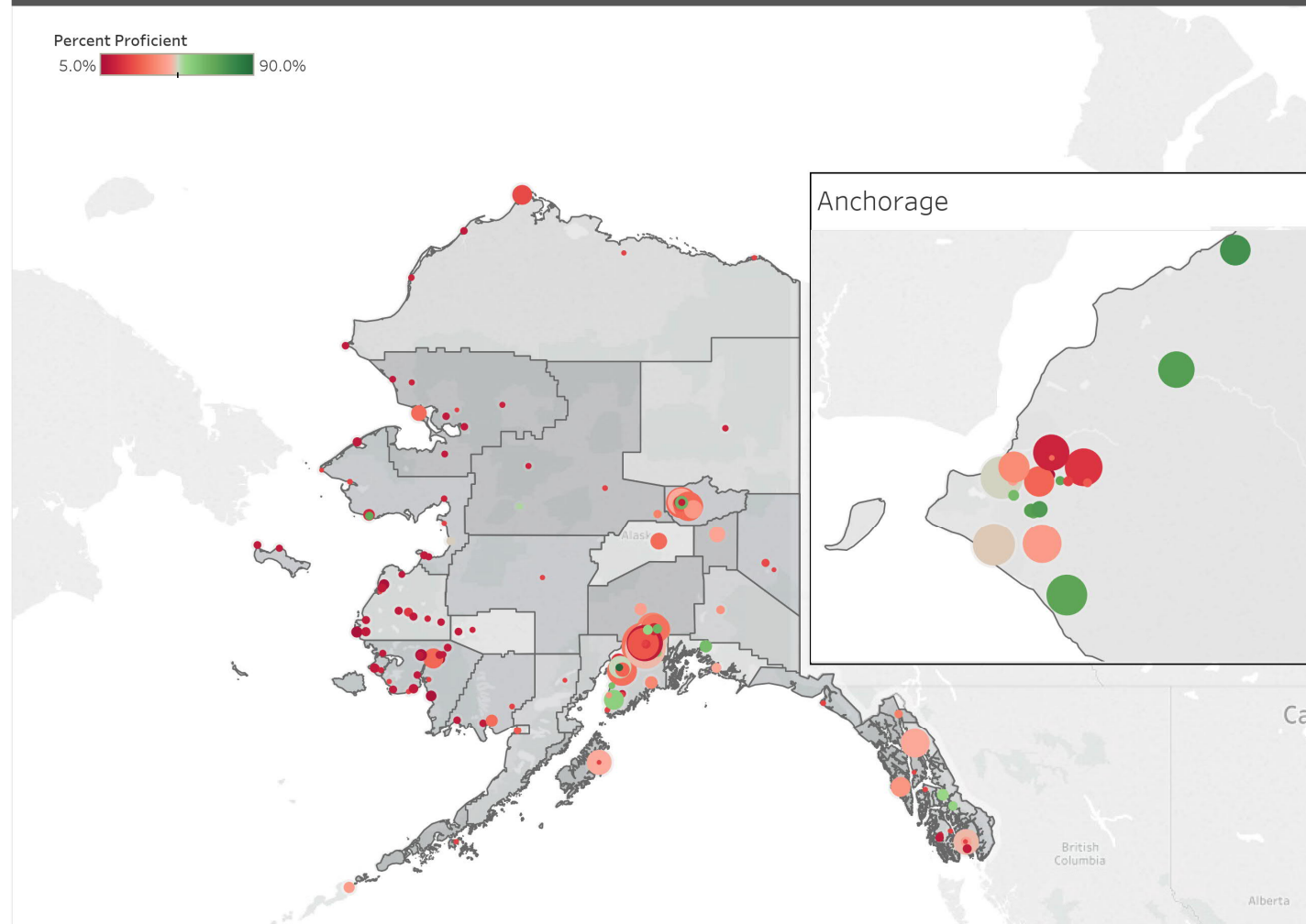
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8th Grade Math

PEAKS Test Results 2017-2018 | Math Grade 8 | Percent Proficient per School



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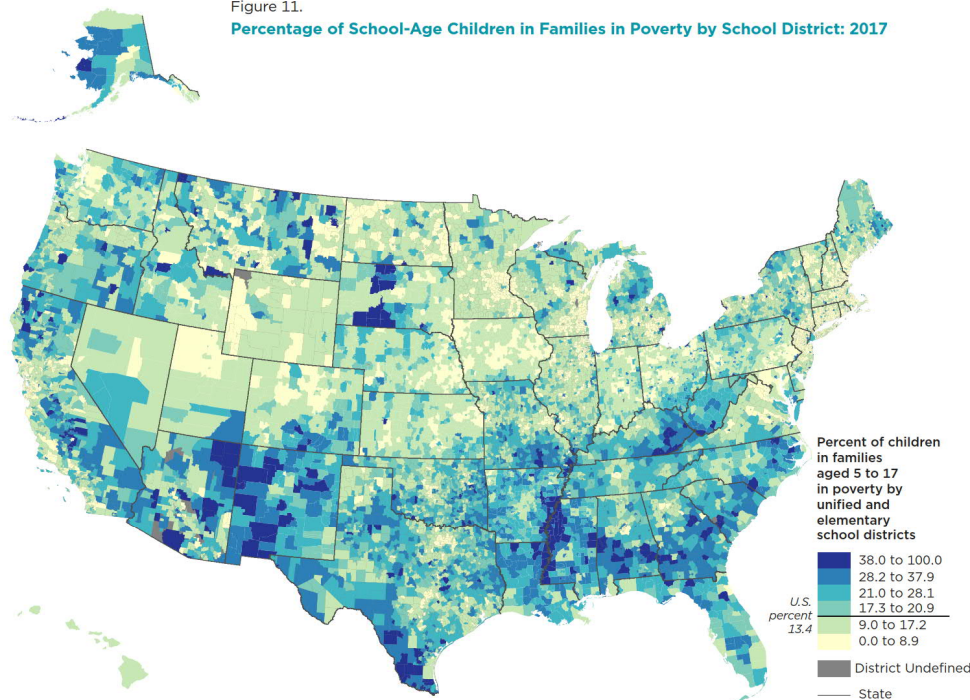
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What drives the variation in test scores?

1. Test scores reflect poverty/affluence; frequently around $\frac{1}{2}$ of the variation in test scores reflect the household and neighborhood challenges associated with poverty
2. The Gates Foundation Project, “Measuring Effective Teaching” focuses on actual test scores less the predicted test score (related to social-economic factors) to assess how well teachers are helping all of their students learn and grow, regardless of where they start.

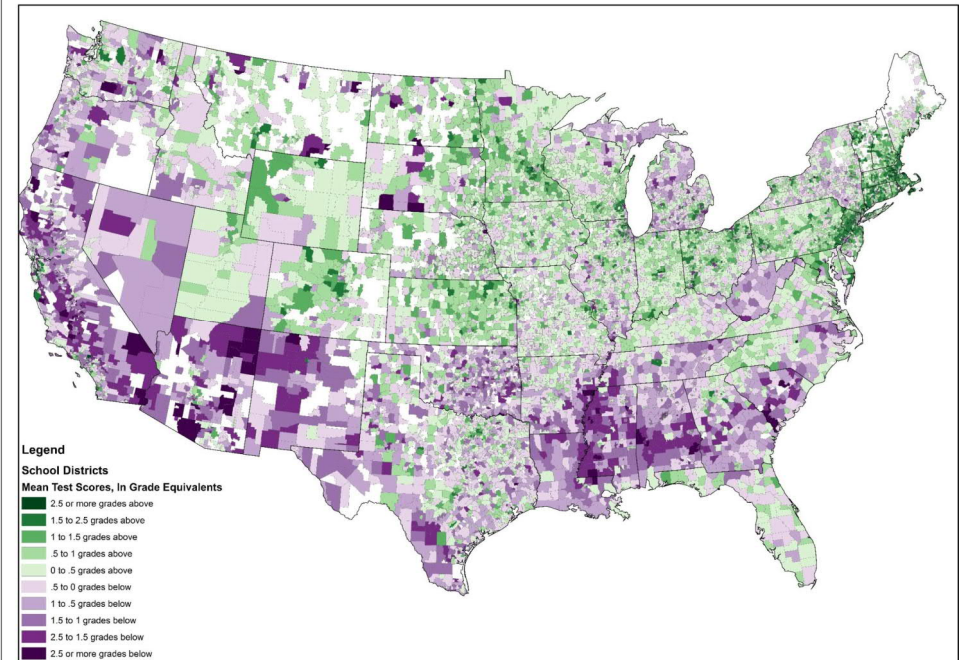
Poverty & Student Achievement Are Highly Interrelated across the U.S.

Figure 11.
Percentage of School-Age Children in Families in Poverty by School District: 2017



Note: The data provided are indirect estimates produced by statistical model-based methods using sample survey, decennial census, and administrative data sources. The estimates contain error stemming from model error, sampling error, and nonsampling error. Unified and Elementary School District boundaries are as of January 1, 2018.
 Source: U.S. Census Bureau, Small Area Income and Poverty Estimates (SAIPE) Program, Dec. 2018.

Average Test Scores, by School District, Grades 3-8, 2009-2013



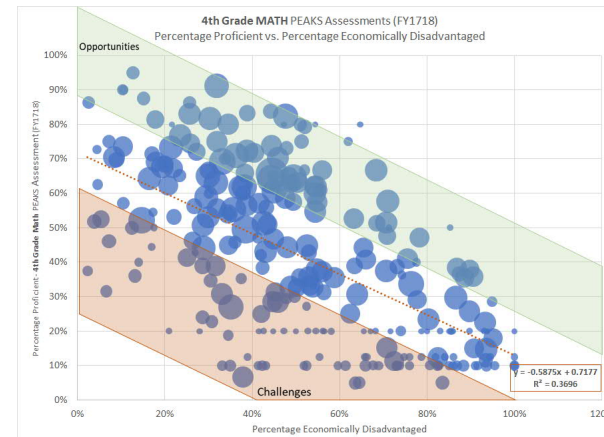
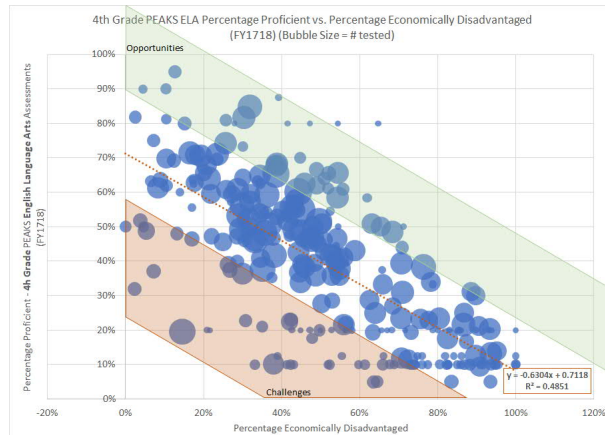
© (2016) sean f. reardon, Demetra Kalogrides, Erin Fahle, Kenneth Shores, and Benjamin Shear. Stanford Education Data Archive: seda.stanford.edu

Poverty & Student Achievement Are Highly Correlated Across Alaska

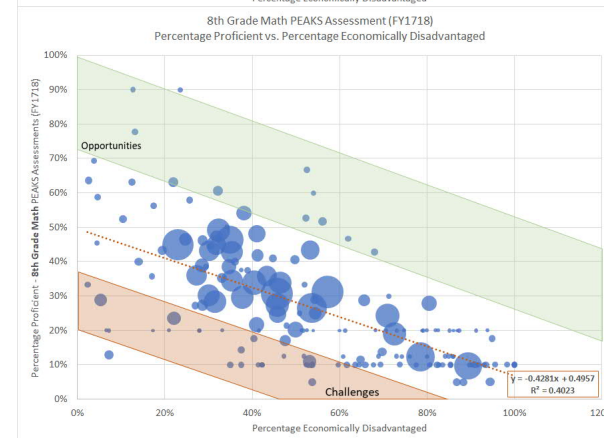
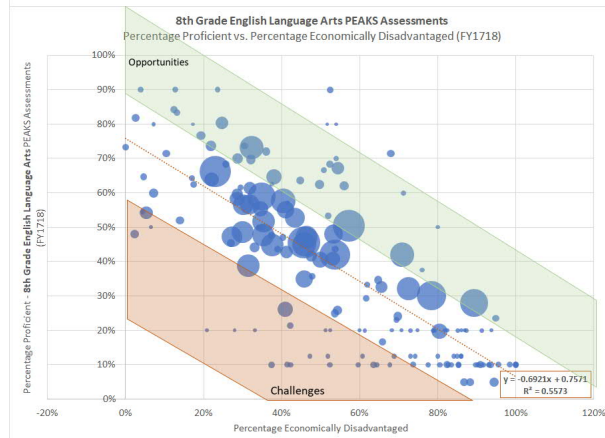
English Language Arts

Math

4th Grade



8th Grade



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Poverty & Student Achievement are relatively highly correlated within Alaska Regions (Rural, Southeast, Railbelt)

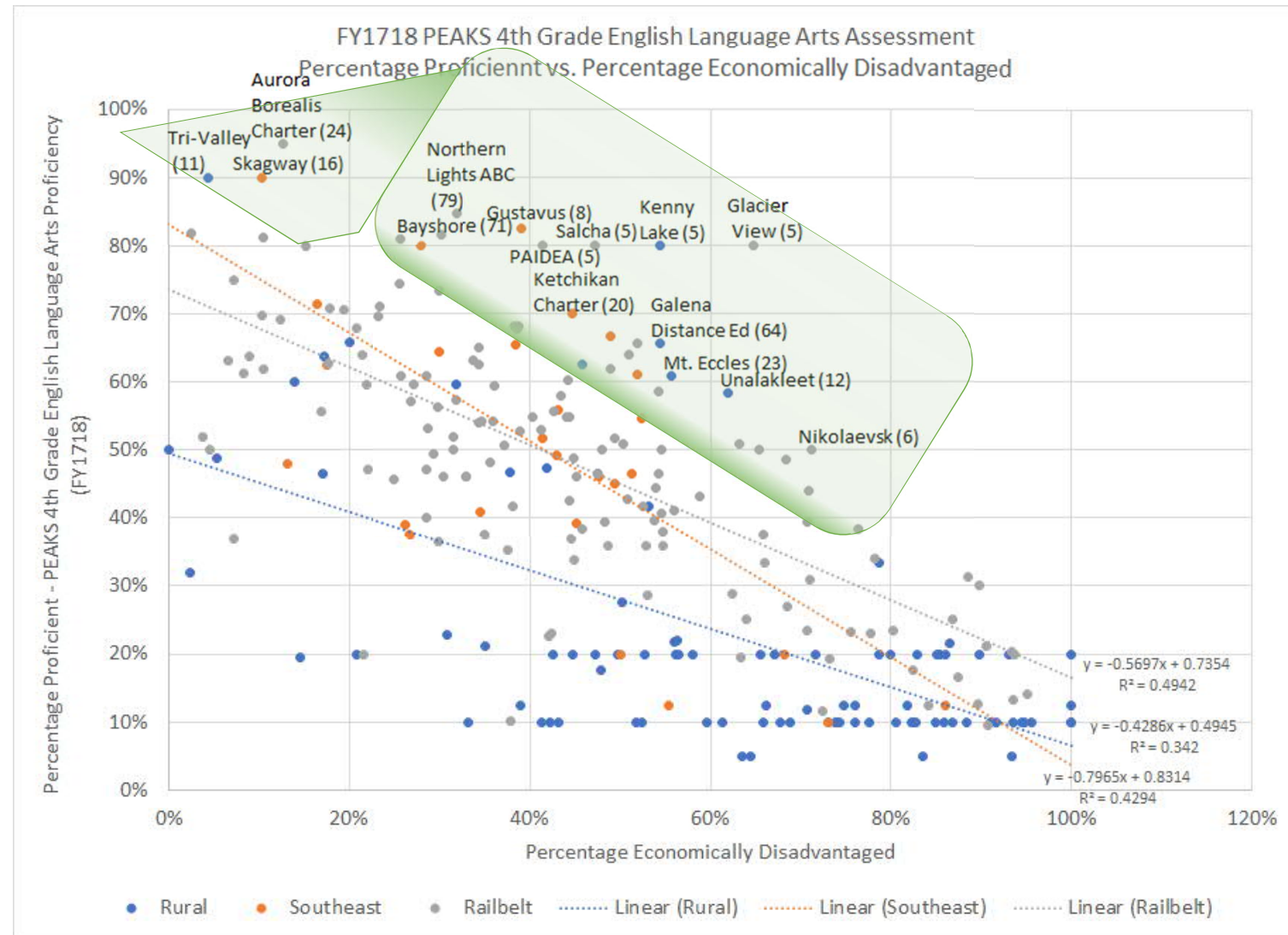


Measuring Effective Teaching In Alaska

Identify schools with students performing well above expectations in light of the prevalence of poverty

K-12 Progress to Date Student Assessments AK PEAKS English Language Arts 4th Grade

What can we learn from schools whose students are performing well above expectations relative to the headwinds of poverty, tailwinds of affluence; examples from across Alaska



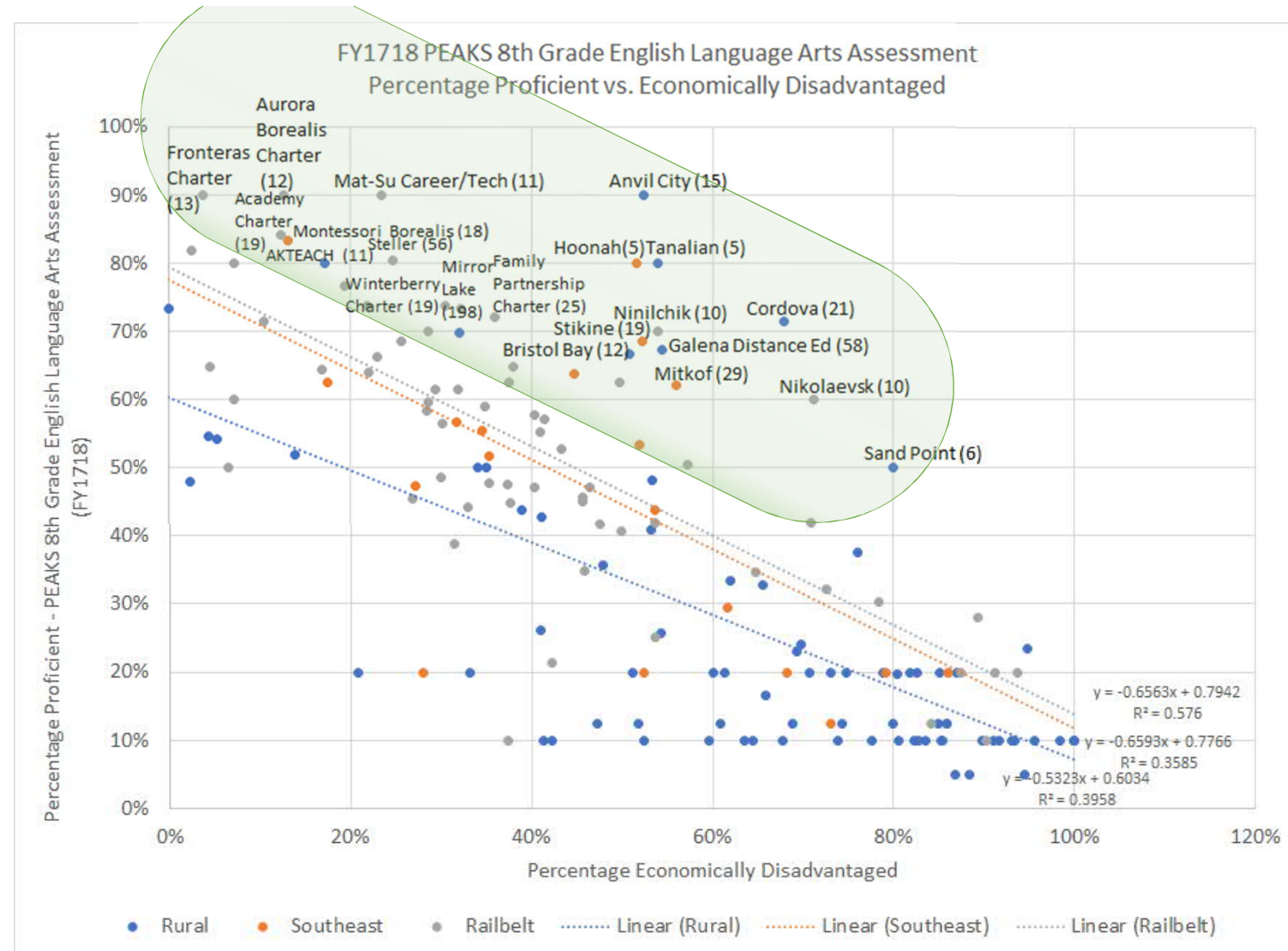
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K-12 Progress to Date Student Assessments AK PEAKS English Language Arts 8th Grade

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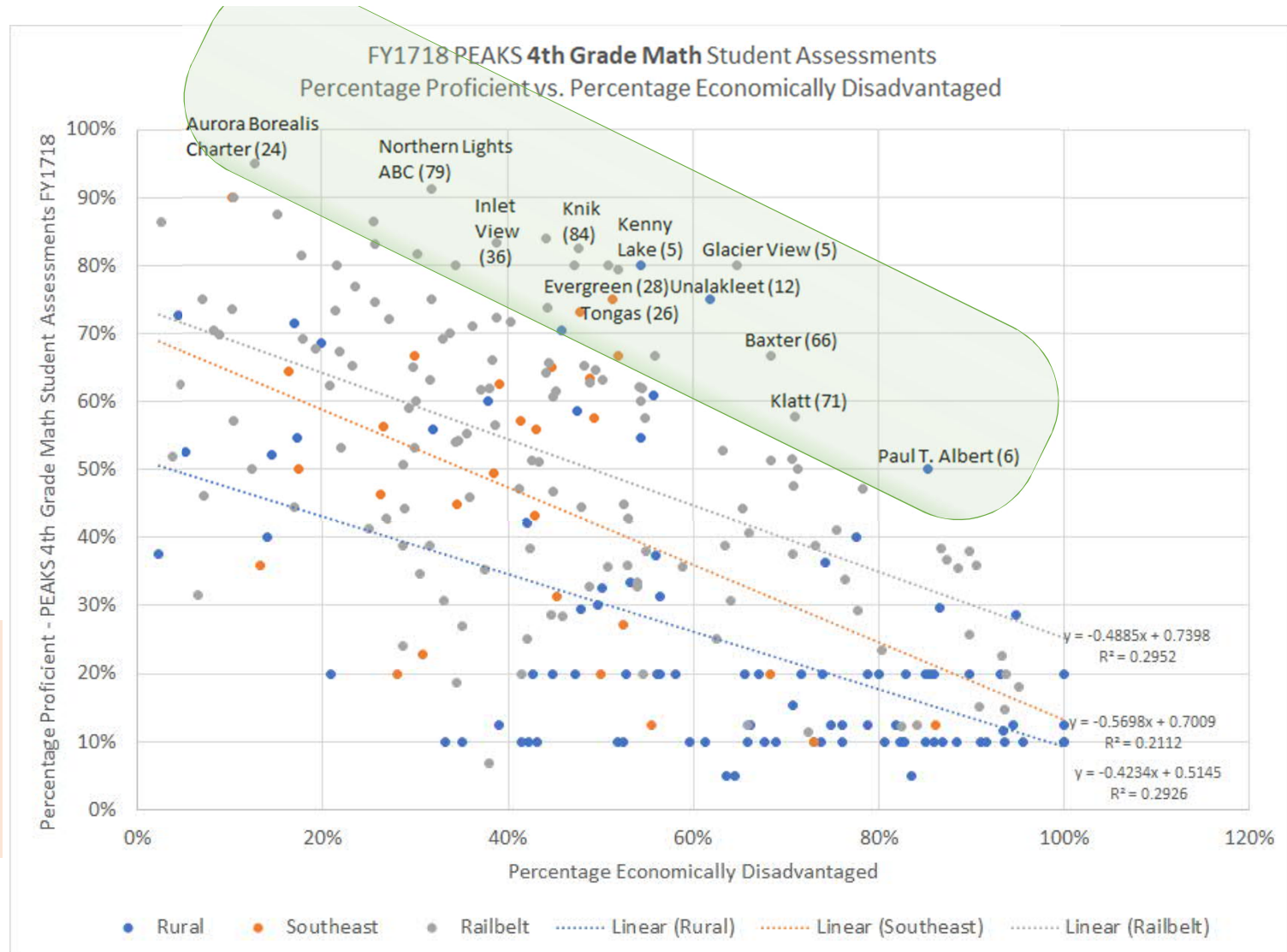
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K-12 Progress to Date Student Assessments— AK PEAKS Math 4th Grade

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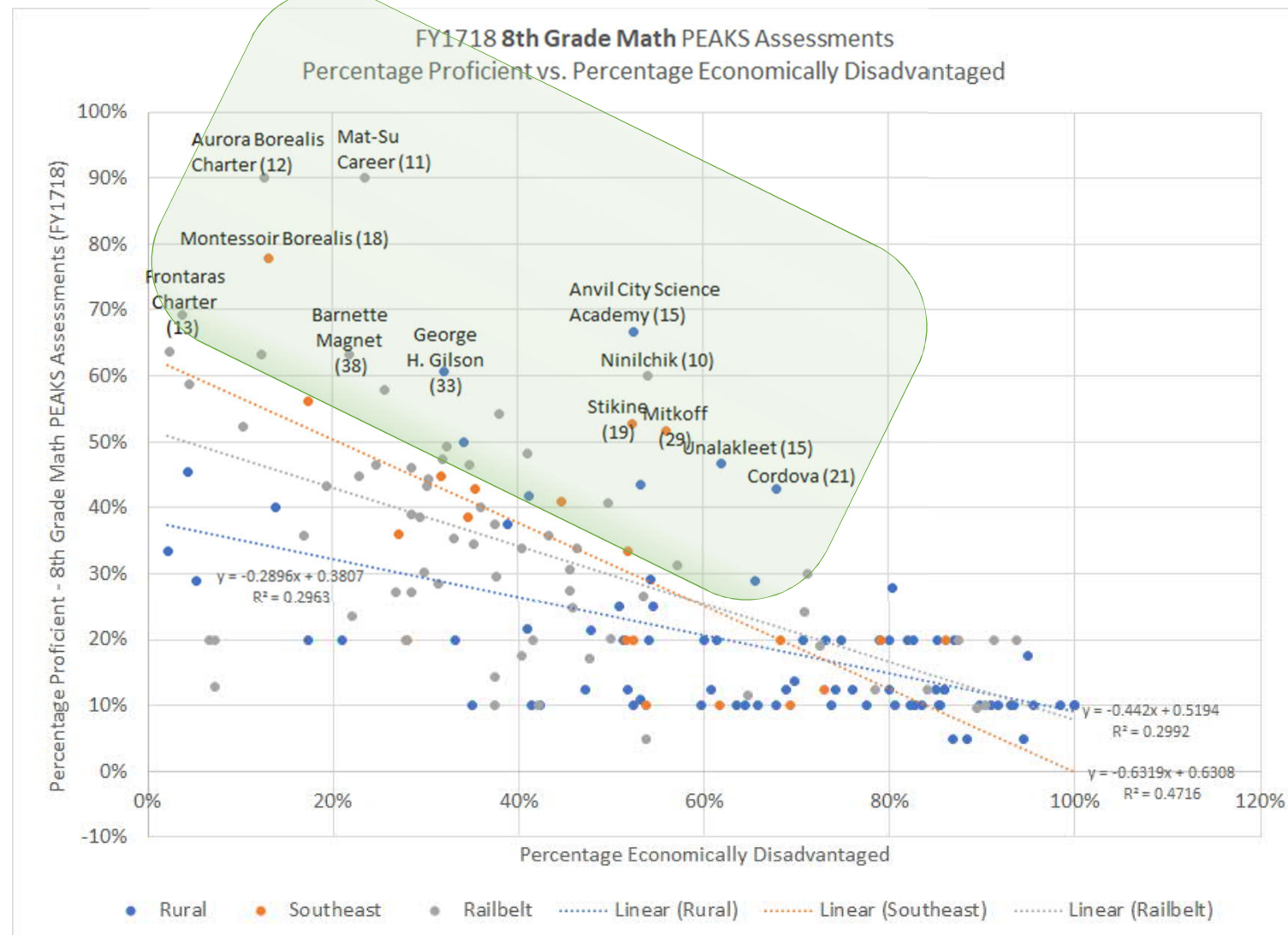
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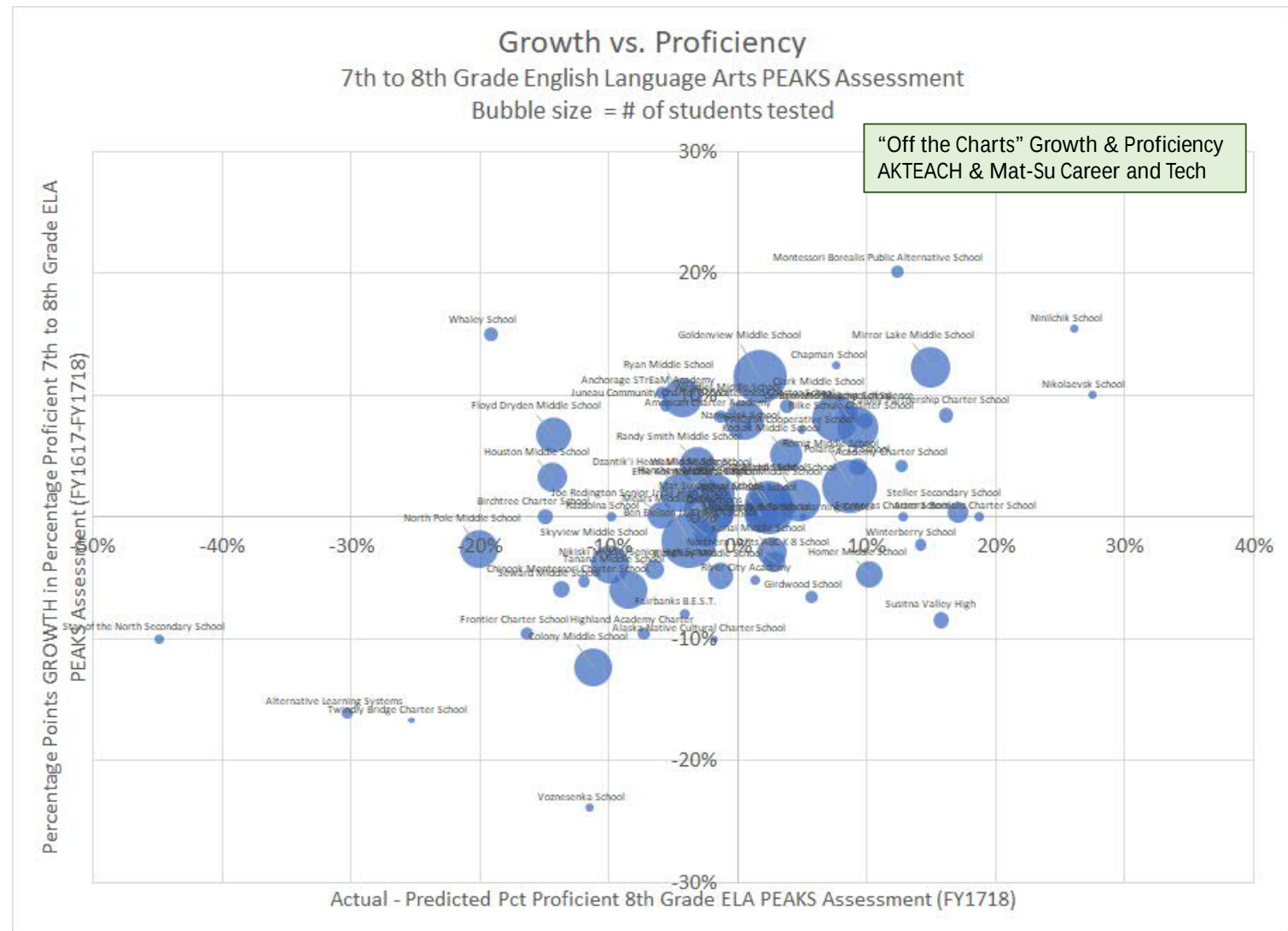
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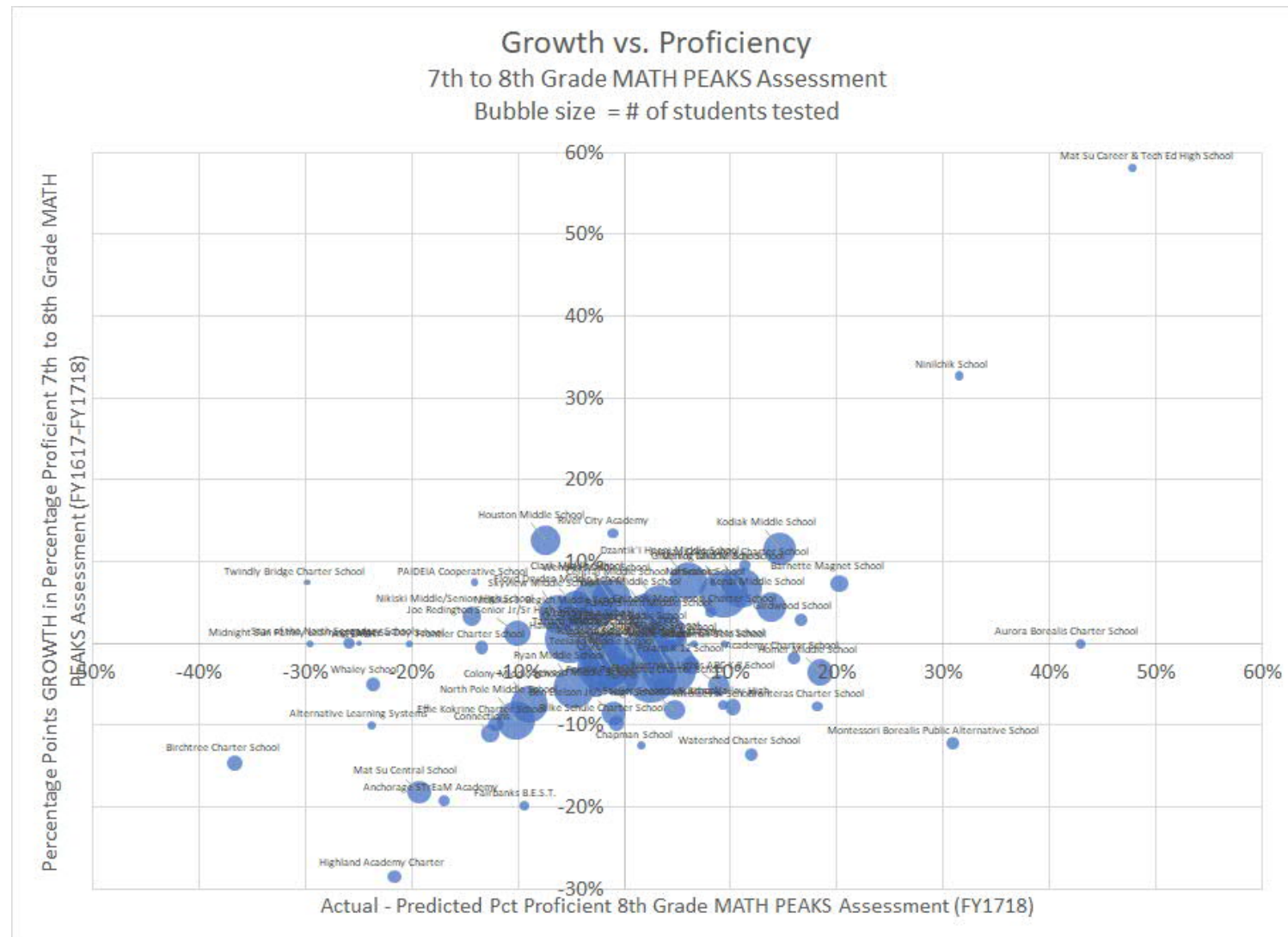
(actual – predicted by
poverty/affluence)

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Measuring Effective Teaching Math Proficiency

(Actual – Predicted by poverty/affluence)



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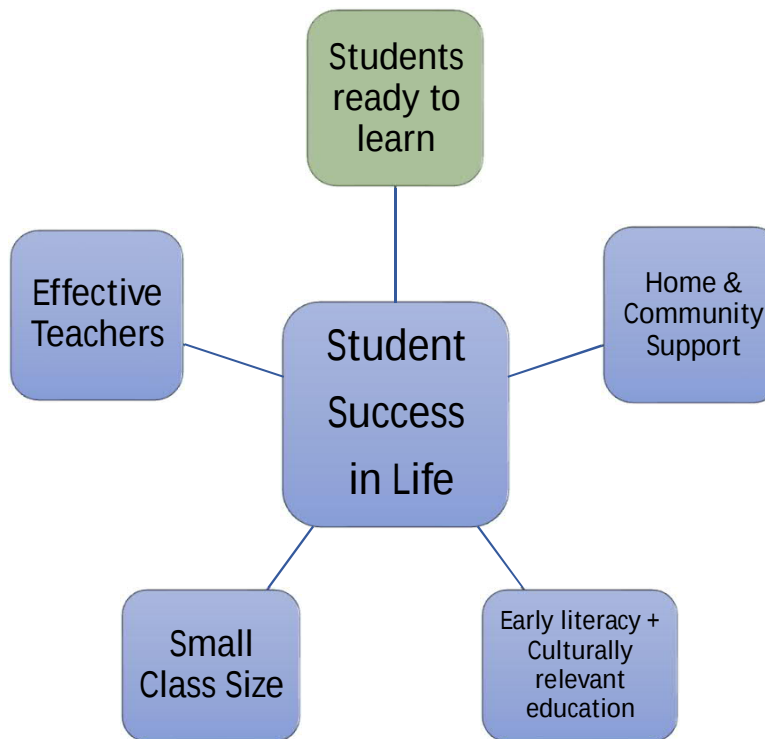
What do Alaska Superintendents identify as key factors driving student academic performance

Survey of school districts with schools who student assessments exceed expected results for their poverty level

What do local subject matter experts tell us when we ask “what is driving your superior results?”

Rural Considerations:

- Rural districts with high teacher turnover rates often graduate fewer than half of their students, and their students have significantly lower reading [and math] proficiency
- Finding ways to engage students, with place based learning and courses that incorporate local culture and industry, is critical in making learning more relevant for students, teachers and the community



Railbelt / Southeast Considerations:

- Highly experienced & effective teachers
- Community of parents that value education
- A generous and supportive municipality
- Kids that respond to our practices; work hard, desire to do well not only as a reflection of their own academic achievement but also a reflection of their school and community
- The more we have, the more we can do for our kids
- Instability in finance and policy are our biggest threat to continued success



What does the national/international research say about factors related to student achievement?

John C Hattie, Meta-Analysis of Education Research, “Visible Learning” (2017)

Professor Raj Chetty (He is a professor of economics at Harvard University, specializing in the field of public economics. Some of Chetty's recent papers have studied equality of opportunity in the United States and the long-term impact of teachers on students' performance. During Chetty's first occasion teaching at Harvard University, he was offered tenure at the age of 28 and accepted at 29, becoming one of the youngest tenured faculty in the history of Harvard's economics department. He is a recipient of the John Bates Clark Medal and a 2012 MacArthur Fellow. Currently, he is also an advisory editor of the Journal of Public Economics.

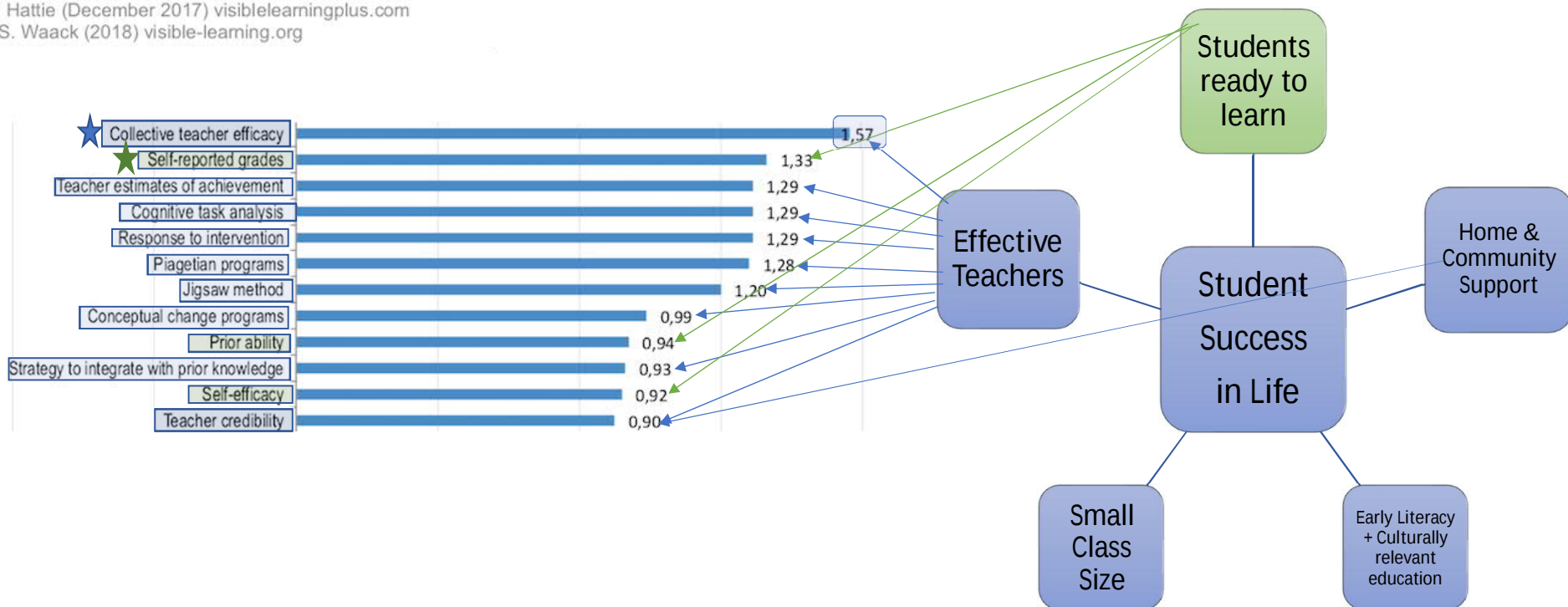
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National & International Research (Hattie)

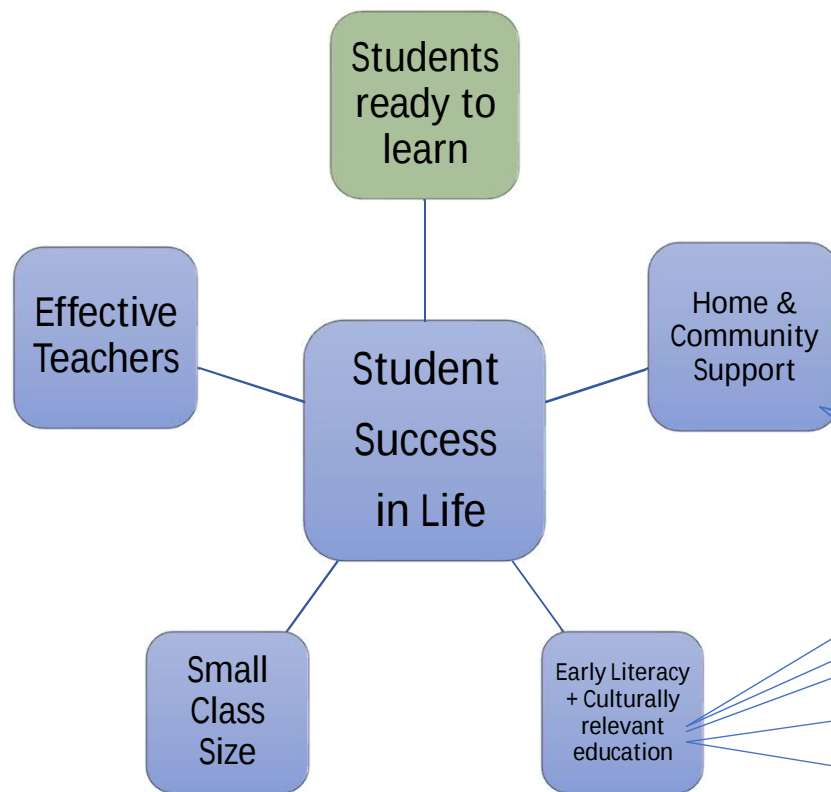
Hattie's 2018 updated list of factors related to student achievement: 252 influences and effect sizes (Cohen's d)

Source: J. Hattie (December 2017) visiblelearningplus.com

Diagram: S. Waack (2018) visible-learning.org

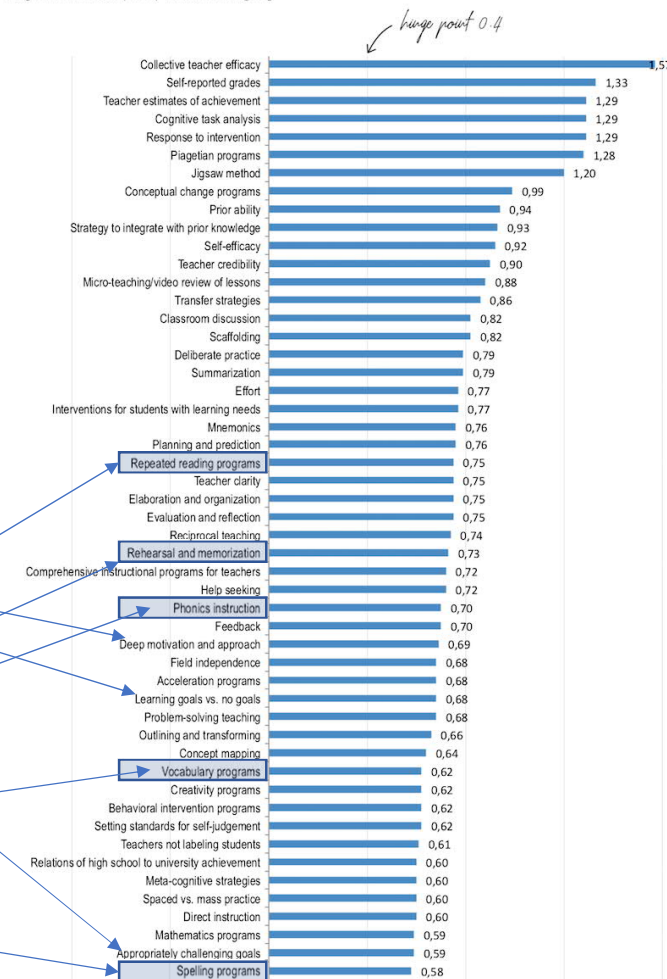


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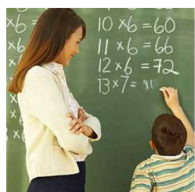


K-12 Investing In Effective Measures to Support Student Success in Life

Rigorous U.S. Research

- How should we change schools to produce better outcomes?

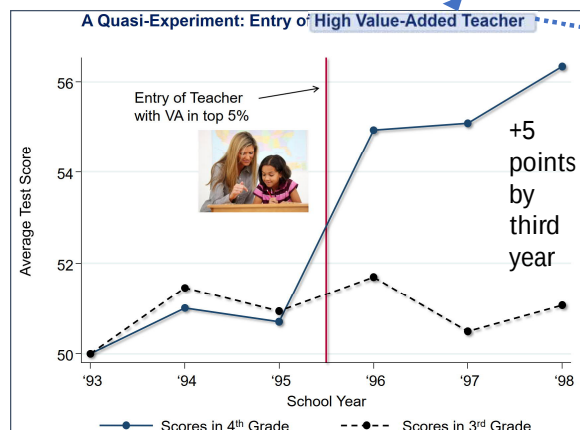
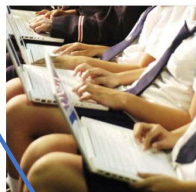
Better Teachers?



Smaller Classes?



Better Technology?



Lessons on Class Size

- Reducing class sizes in primary school by hiring more teachers can have large returns
 - Present value of lifetime earnings of a child growing up in a family at 25th percentile is about \$500,000 on average
 - 4% earnings gain from smaller class = \$20,000
 - Dividing a class of 30 students into two would increase total earnings of students by more than \$600,000
 - Costs (hiring another teacher and an additional room) likely to be well below \$600,000

Effective Teachers

Students ready to learn

Student Success in Life

Home & Community Support

Small Class Size

Early Literacy + Culturally relevant education

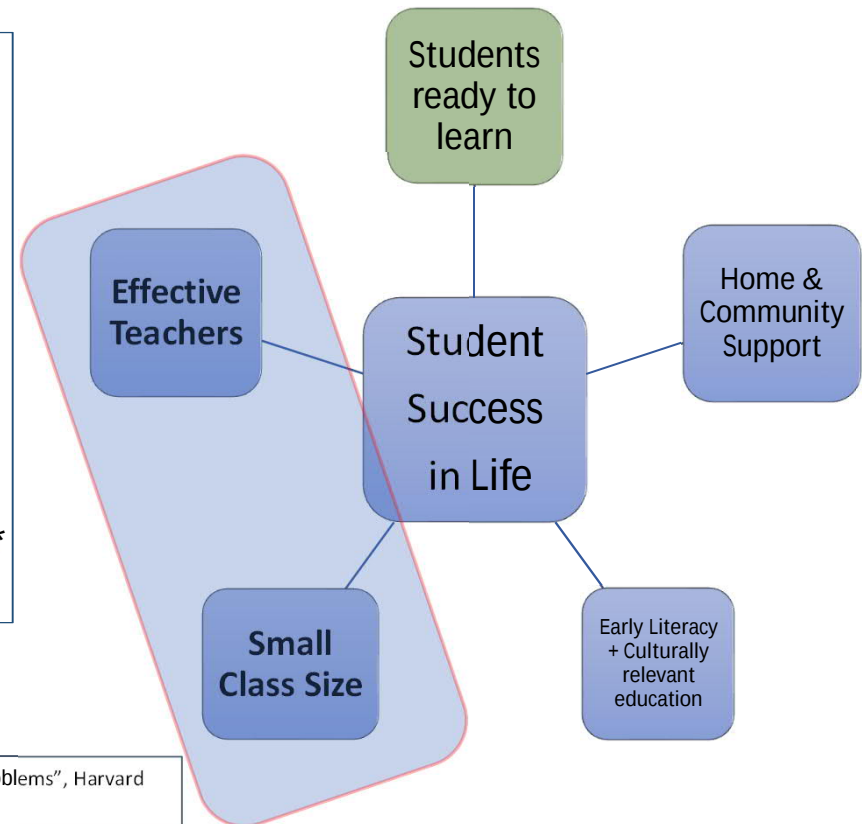
Source: Professor Raj Chetty, Head Section Leader Rebecca Toseland, "Using Big Data to Solve Social & Economic Problems", Harvard University, Opportunity Insights, Lecture Chart Pack #6, Regression discontinuity using class size cutoffs, 2018

K-12 Investing In Effective Measures to Support Student Success in Life

Reducing Class Size + Highly Effective Teachers = Large Long-Term Returns

- New data show that changing public schools in certain specific ways can have large long-term returns
- Reducing class size can be very valuable
 - But critical to hire highly effective new teachers when doing so
- There are large, measurable differences in teacher quality,
 - We should do more to attract and retain top teachers in public schools* (not just using value-added metrics but also other tools)

Highly effective =
Growth across skills &
knowledge + social skills
to prepare students for
success in life



Source: Professor Raj Chetty, Head Section Leader Rebecca Toseland, "Using Big Data to Solve Social & Economic Problems", Harvard University, Opportunity Insights, Lecture Chart Pack #6, Regression discontinuity using class size cutoffs, 2018

Appendices

1. Investment levels; Return on Investment Metrics
2. NAEP, PEAKS & MAP; What do tests measure
3. What drives success in life? [Chetty, Jackson]
4. DEED Functional Expenditures Across Alaska Districts

Investment Levels, Return on Investment

Alaska & Other States

- Investment Levels, Cost of Living Adjusted (COLA)
- Return on Investment, Cost of Living Adjusted (COLA)
- Test scores & success in life correlations

Alaska Districts

- Investment percentage by category

Illustrative Anchorage School District Comparisons

- PEAKS mapped to NAEP Scale; Council of Great City Schools Comparisons
- PEAKS growth & proficiency by grade cohort (English Language Arts)

K-12 Investment Levels

Total Current Spending

Adjusted for Cost of Living (State)

Alaska had
already fallen to
78 percent of
Wyoming in
FY16

		Table 8. Per Pupil Amounts for Current Spending of Public Elementary-Secondary School Systems by State: Fiscal Year 2016							
		(Dollars.)							
				SORT		ADJUSTED FOR STATE AVERAGE COST OF LIVING, C2ER			
								Instruction	

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K-12 Investment Levels

Salaries & Wages

Adjusted for Cost of Living (State)

Alaska had already fallen to below the middle of the U.S. states in FY16; 63 percent of Wyoming

Table 8. Per Pupil Amounts for Current Spending of Public Elementary-Secondary School Systems by State: Fiscal Year 2016							
(Dollars.)			ADJUSTED FOR STATE AVERAGE COST OF LIVING, C2ER				
			SORT				
RANK	Geographic area	Total ¹	Salaries and wages	Employee benefits	Instruction		
					Total ¹	Salaries and wages	Employee benefits
	United States.....	11,762	6,866	2,806	7,160	4,603	1,885
1	Wyoming.....	17,199	10,065	4,514	10,199	6,486	2,854
2	New York.....	16,882	9,286	4,877	11,885	7,101	3,850
3	District of Columbia.....	12,305	8,735	1,532	6,909	6,132	1,022
4	New Jersey.....	15,092	8,605	4,030	8,788	5,634	2,556
5	Connecticut.....	15,086	8,447	4,181	9,276	5,912	2,878
6	Vermont.....	14,808	8,403	3,686	8,882	5,587	2,498
7	North Dakota.....	13,413	8,062	2,957	8,029	5,463	2,048
8	Iowa.....	12,218	7,804	2,578	7,436	5,209	1,698
9	Pennsylvania.....	15,111	7,722	4,539	9,258	5,422	3,153
10	Minnesota.....	12,416	7,722	2,727	8,096	5,431	1,948
11	Delaware.....	14,306	7,669	3,981	8,936	5,441	2,868
12	Nebraska.....	13,244	7,649	2,679	8,624	5,447	1,960
13	Ohio.....	13,106	7,566	2,953	7,657	4,951	1,831
14	Illinois.....	14,590	7,461	4,646	8,886	5,084	3,148
15	Maryland.....	11,038	7,421	2,925	6,875	4,453	2,032
16	Massachusetts.....	11,730	7,415	2,836	7,307	5,073	2,049
17	Rhode Island.....	12,566	7,359	3,405	7,310	5,001	2,266
18	New Hampshire.....	13,339	7,224	3,379	8,357	5,182	2,418
19	Missouri.....	11,471	7,160	2,211	6,848	4,728	1,439
20	Maine.....	11,689	7,050	2,835	6,679	4,697	1,924
21	Virginia.....	11,190	6,970	2,741	6,818	4,618	1,805
22	Texas.....	9,886	6,878	1,203	6,046	4,604	774
23	Wisconsin.....	11,904	6,729	2,929	6,959	4,628	1,948
24	West Virginia.....	11,773	6,560	3,164	6,786	4,099	1,965
25	Montana.....	11,303	6,545	2,024	6,674	4,444	1,340
26	Arkansas.....	11,214	6,540	1,868	6,309	4,179	1,194
27	Kansas.....	11,040	6,521	1,953	6,721	4,312	1,287
28	Georgia.....	10,761	6,480	2,396	6,582	4,378	1,692
29	Michigan.....	13,004	6,422	4,169	7,604	4,281	2,796
30	Kentucky.....	10,526	6,401	2,608	6,091	4,134	1,633
31	Washington.....	10,766	6,400	2,420	6,103	4,024	1,489
32	Alaska.....	13,333	6,343	3,808	7,195	4,088	2,382
33	Louisiana.....	11,693	6,336	3,227	6,567	4,081	2,028
34	New Mexico.....	10,214	6,063	2,130	5,710	4,012	1,390
35	Mississippi.....	10,228	6,055	2,063	5,820	3,923	1,323

K-12 Investment Levels

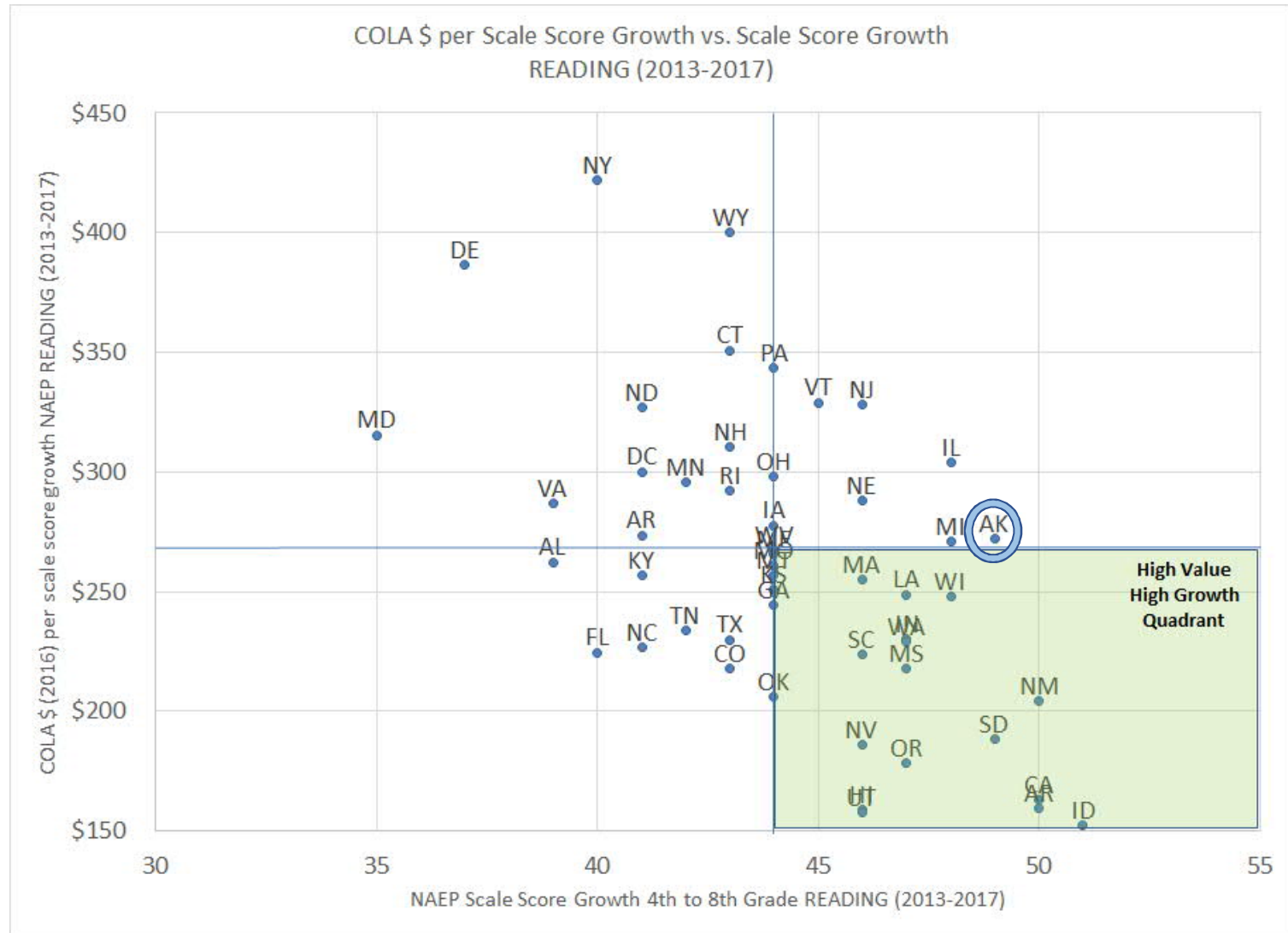
Instructional Salary & Wages

Adjusted for Cost of Living (State)

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63 percent of Wyoming
58 percent of New York

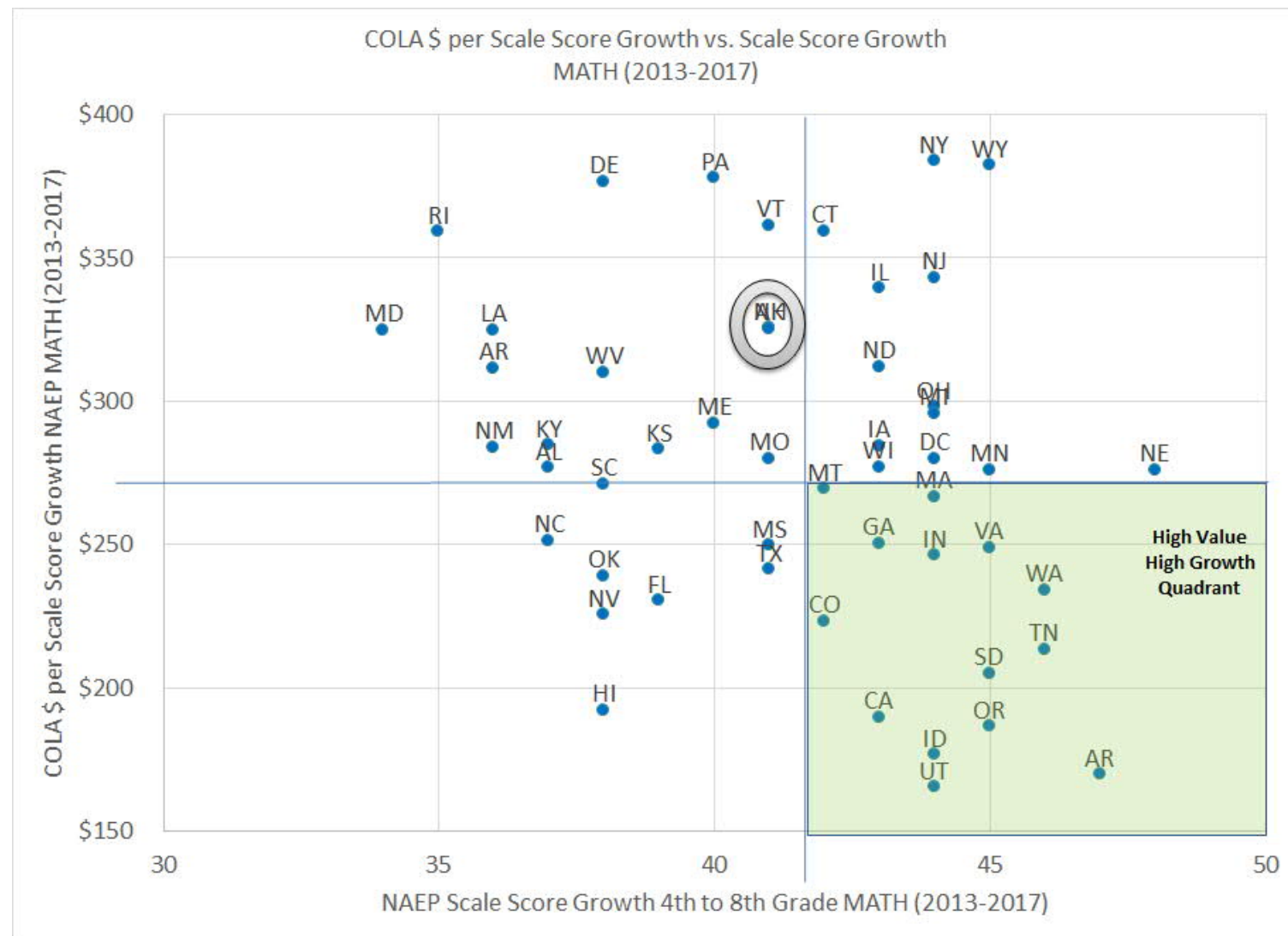
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33	North Carolina.....	9,296	5,890	1,961	5,829	4,047	1,327
34	Tennessee.....	9,814	5,919	1,918	6,022	4,036	1,331
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Return on K-12 Investments COLA \$ per NAEP scale score growth - READING



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Return on K-12 Investments COLA \$ per NAEP scale score growth point – Math



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K-12 Investment Levels

Instructional Salary & Wages

Governor's Proposed Budget FY20

Adjusted for Cost of Living (State)

April 24, 2019

AK Governor's Proposed FY20 Budget would likely plunge Alaska's cost of living adjusted instructional salaries and wages per pupil to last in the U.S.; this scenario presents a high risk of exacerbating mounting challenges around attracting and retaining highly qualified and effective teachers

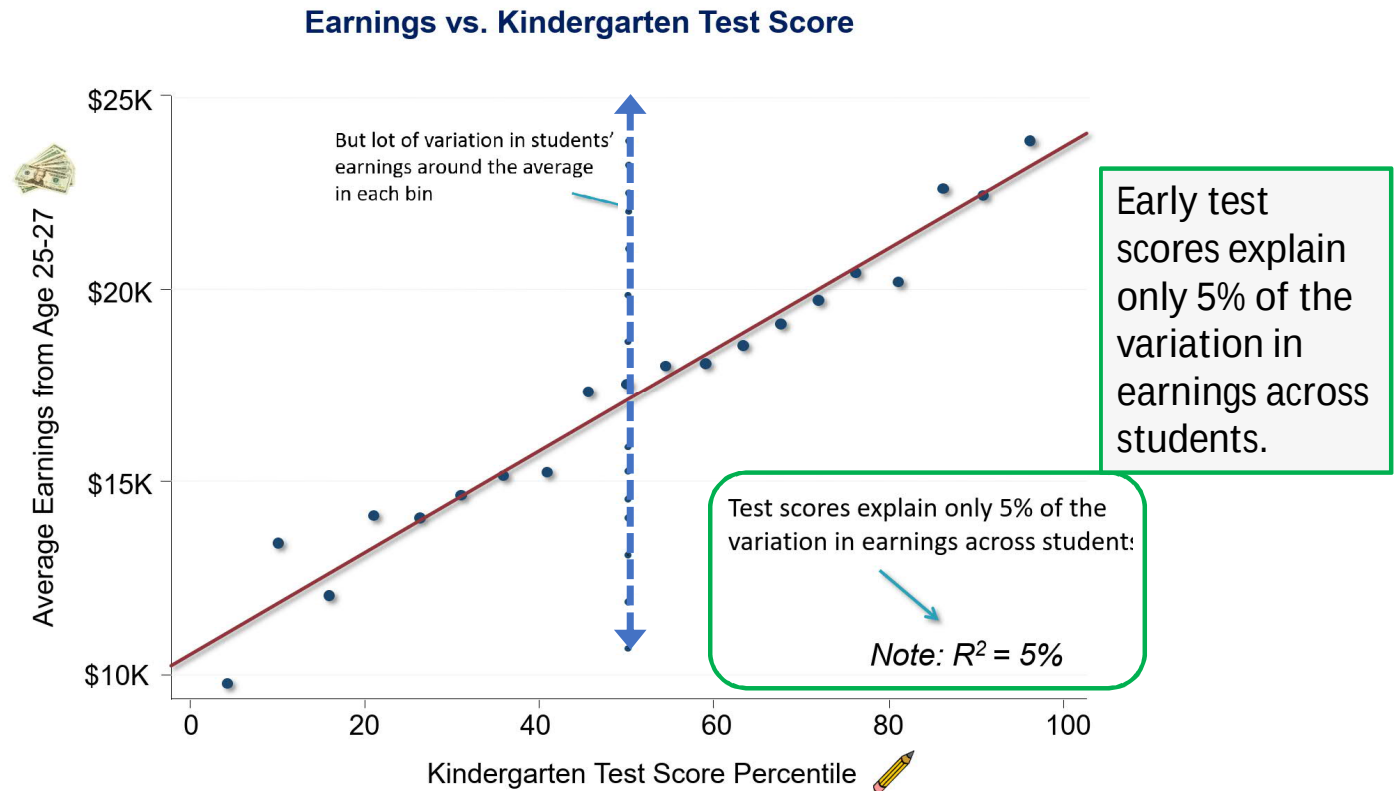
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Table 8. Per Pupil Amounts for Current Spending of Public Elementary-Secondary School Systems							
by State: PROJECTED TO FY20 AK Gov's Proposed Budget (-23%); L48 Growth (+3% CAGR)^4 = 12.6% increase)							
(Dollars.)		ADJUSTED FOR STATE AVERAGE COST OF LIVING, C2ER					
RANK	Geographic area	112.6%			SORT		
		77.0%			Instruction		
		Total ¹	Salaries and wages	Employee benefits	Total ¹	Salaries and wages	Employee benefits
	United States.....	13,238	7,728	3,158	8,058	5,181	2,122
1	New York.....	19,001	10,451	5,489	13,377	7,992	4,333
2	Wyoming.....	19,357	11,328	5,080	11,479	7,300	3,212
3	District of Columbia.....	13,850	9,831	1,725	7,776	6,902	1,151
4	Connecticut.....	16,979	9,507	4,706	10,440	6,654	3,240
5	New Jersey.....	16,986	9,685	4,536	9,891	6,341	2,876
6	Vermont.....	16,666	9,458	4,149	9,996	6,288	2,811
7	North Dakota.....	15,096	9,073	3,328	9,037	6,148	2,306
8	Nebraska.....	14,906	8,609	3,015	9,706	6,131	2,206
9	Delaware.....	16,101	8,631	4,480	10,058	6,124	3,228
10	Minnesota.....	13,974	8,691	3,069	9,112	6,113	2,192
11	Pennsylvania.....	17,007	8,691	5,108	10,420	6,102	3,548
12	Iowa.....	13,751	8,783	2,901	8,370	5,862	1,911
13	New Hampshire.....	15,013	8,131	3,803	9,406	5,832	2,721
14	Illinois.....	16,421	8,397	5,229	10,001	5,722	3,544
15	Massachusetts.....	13,202	8,345	3,192	8,224	5,710	2,306
16	Rhode Island.....	14,143	8,283	3,832	8,227	5,629	2,550
17	Ohio.....	14,751	8,515	3,323	8,618	5,572	2,061
18	Missouri.....	12,911	8,058	2,488	7,707	5,322	1,619
19	Maine.....	13,155	7,935	3,190	7,517	5,286	2,165
20	Wisconsin.....	13,397	7,573	3,296	7,832	5,209	2,193
21	Virginia.....	12,595	7,845	3,085	7,674	5,197	2,032
22	Texas.....	11,126	7,741	1,354	6,804	5,182	871
23	Maryland.....	12,423	8,352	3,292	7,738	5,012	2,287
24	Montana.....	12,722	7,366	2,278	7,512	5,002	1,509
25	Georgia.....	12,112	7,293	2,697	7,408	4,928	1,904
26	Kansas.....	12,425	7,339	2,198	7,565	4,854	1,449
27	Michigan.....	14,636	7,228	4,692	8,559	4,818	3,147
28	Arkansas.....	12,621	7,361	2,103	7,101	4,703	1,344
29	Kentucky.....	11,847	7,204	2,935	6,856	4,653	1,838
30	West Virginia.....	13,251	7,384	3,561	7,637	4,614	2,212
31	Louisiana.....	13,161	7,131	3,632	7,391	4,593	2,283
32	North Carolina.....	10,463	6,629	2,208	6,561	4,555	1,493
33	Tennessee.....	11,046	6,662	2,159	6,778	4,543	1,499
34	Washington.....	12,117	7,204	2,724	6,869	4,529	1,675
35	New Mexico.....	11,495	6,824	2,397	6,426	4,515	1,565
36	Mississippi.....	11,512	6,814	2,322	6,551	4,415	1,489
37	Indiana.....	12,180	6,716	3,618	7,051	4,411	2,316
38	South Carolina.....	11,591	6,682	2,453	6,366	4,284	1,540
39	South Dakota.....	10,379	6,172	1,820	6,063	4,193	1,209
40	Alabama.....	11,515	6,427	2,599	6,554	4,168	1,604
41	Colorado.....	10,538	6,608	1,962	5,968	4,137	1,177
42	Nevada.....	9,637	5,726	2,376	5,574	3,668	1,510
43	Oklahoma.....	10,214	5,664	1,957	5,711	3,637	1,274
44	Florida.....	10,109	5,741	1,800	6,208	3,634	1,101
45	Idaho.....	8,742	5,212	1,887	5,205	3,581	1,273
46	California.....	9,177	5,323	2,227	5,468	3,417	1,399
47	Arizona.....	8,964	5,344	1,704	4,801	3,321	1,032
48	Oregon.....	9,437	5,002	2,708	5,507	3,251	1,725
49	Utah.....	8,174	4,693	2,308	5,251	3,171	1,528
50	Hawaii.....	8,218	4,535	1,865	4,821	3,114	1,254
51	Alaska.....	10,267	4,884	2,932	5,540	3,052	1,930
Alaska/U.S.						0.59	

Education

What drives success in life?

Chetty et al.,
early test scores as
~5% of success in
life as measured by
earnings age 25-27



Source: Professor Raj Chetty, Head Section Leader Rebecca Toseland, "Using Big Data to Solve Social & Economic Problems", Opportunity Insights, Lecture Chart Pack #5

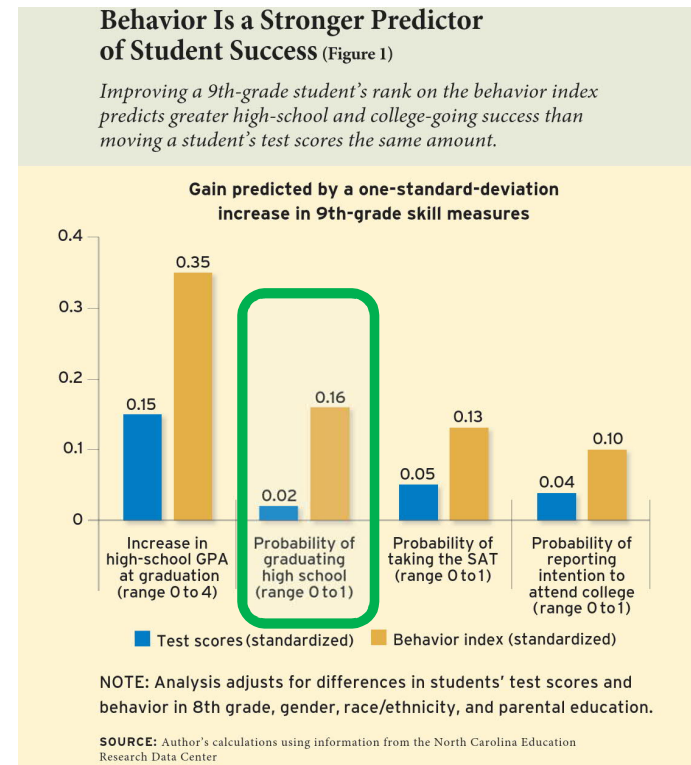
What drives success in life?

Jackson,
Social skills as primary driver of success in school and success in life; teachers impact on social skills is more predictive of students' longer term success in graduating high school and going on to success in life

Test scores are often the best available measure of student progress, but they do not capture every skill needed in adulthood. A growing research base shows that non-cognitive (or social-emotional) skills like adaptability, motivation and self-restraint are key determinants of adult outcomes. Therefore, if we want to identify good teachers, we ought to look at how teachers affect their students' development across a range of skills – both academic and non-cognitive.

A robust data set on 9th grade students in North Carolina allows me to do just that.

I find that, while teachers have notable effects on both test scores and non-cognitive skills, their impact on non-cognitive skills is 10 times more predictive of students' longer-term success in high school than their impact on test scores.



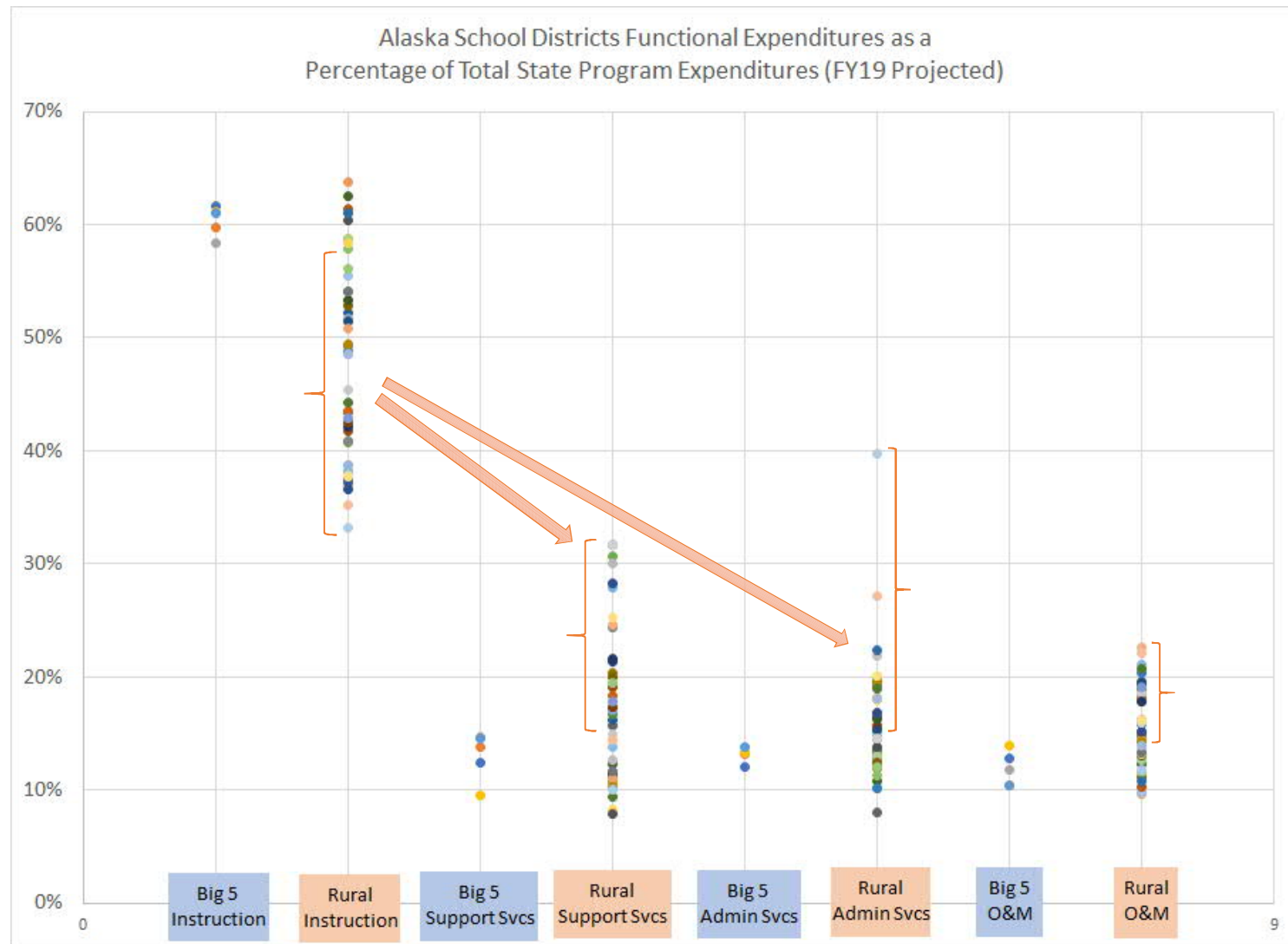
Source: C. Kirabo Jackson, "The Full Measure of a Teacher", Education Next, Winter 2019

Review of Alaska School District Functional Expenditures

Big 5 & Rural Alaska Districts

Alaskan districts continue to face significant challenges training, attracting and retaining qualified and effective teachers. These challenges remain especially daunting across rural Alaska where many districts hire the local talent they can find to fill positions in support and administrative services to help support their students.

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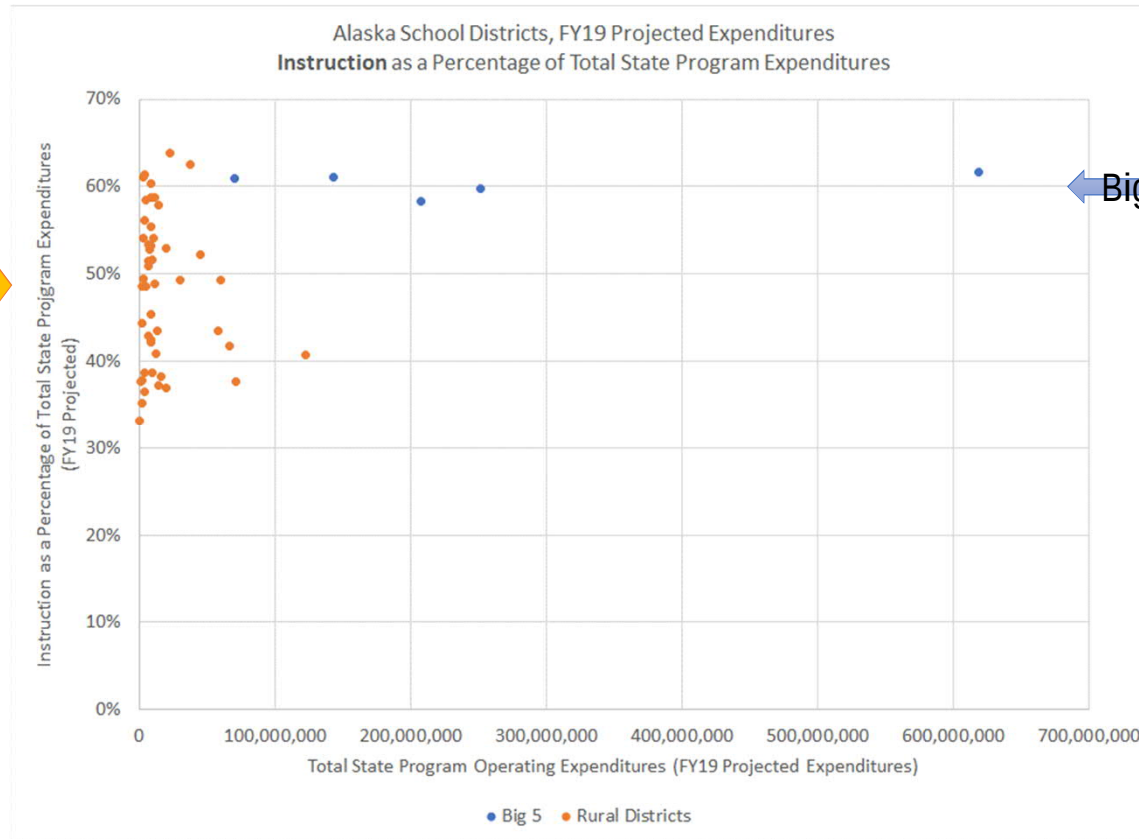


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Prepared for House/Senate Education

Alaska Districts Expenditures by Function

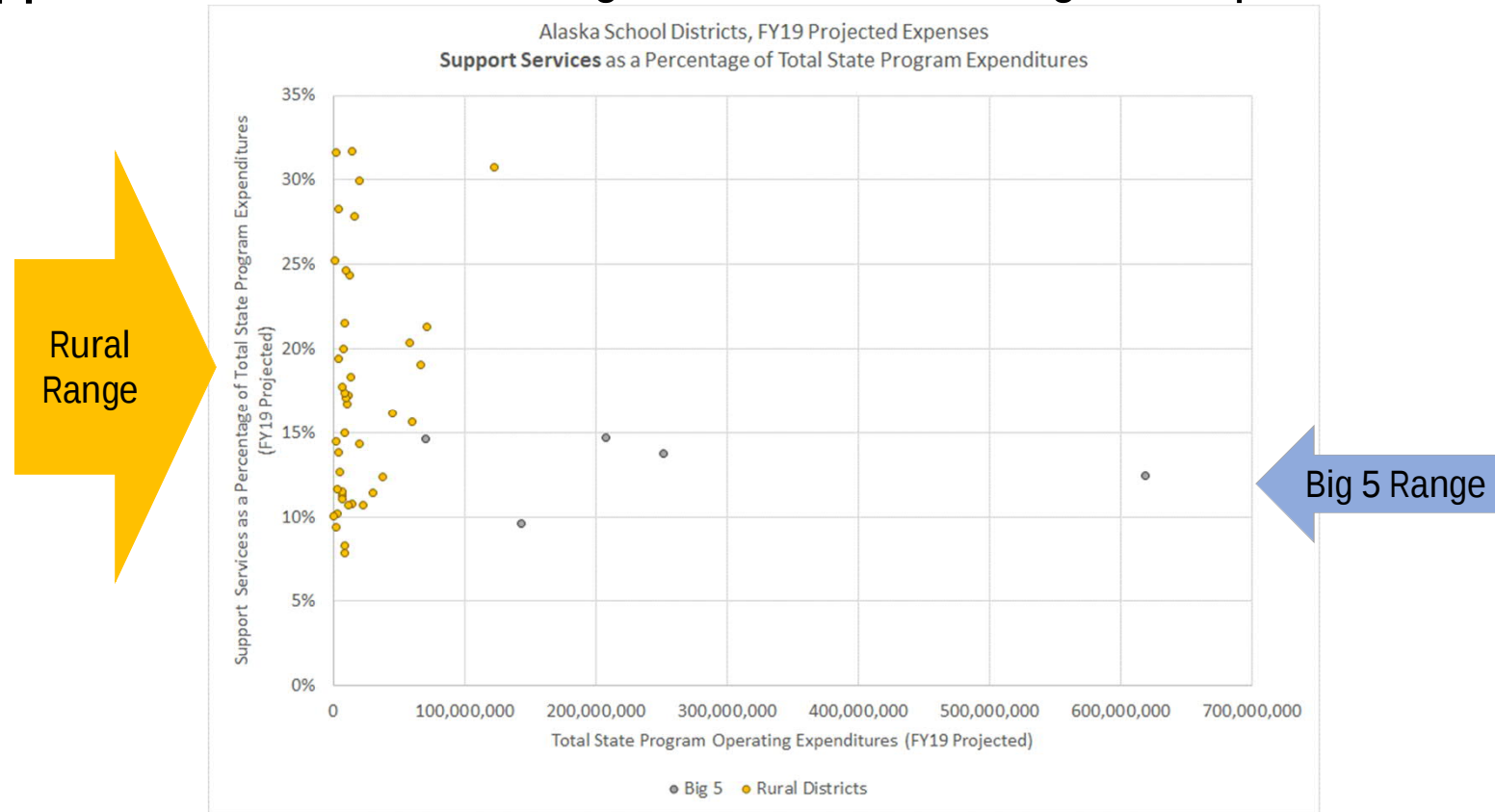
Instruction as Percentage of Total State Program Expenditures (FY19)



Big 5 Range

Alaska Districts Expenditures by Function

Support Services as Percentage of Total State Program Expenditures (FY19)



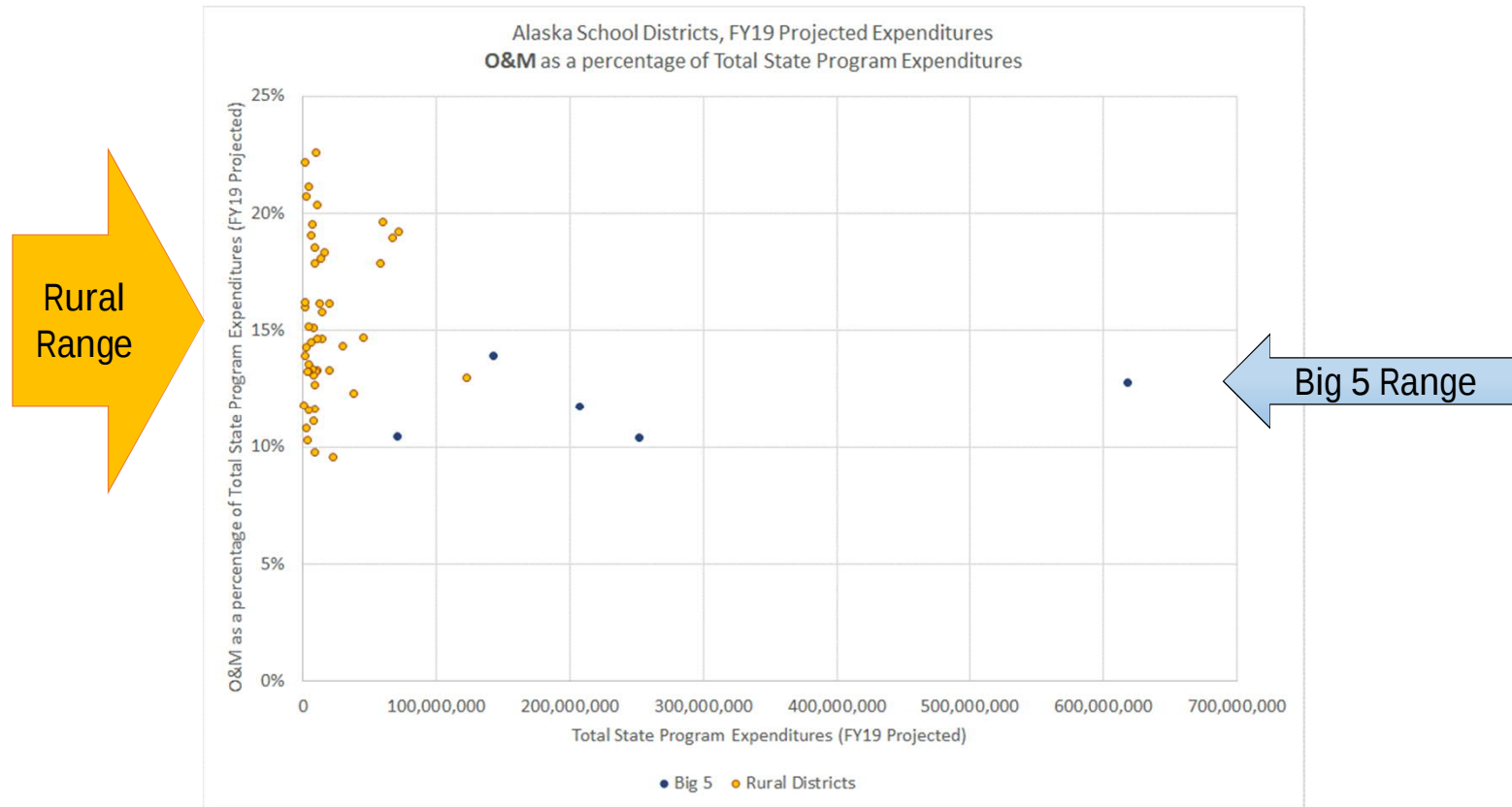
Alaska Districts Expenditures by Function

Administrative Services as Percentage of Total State Program Expenditures (FY19)



Alaska Districts Expenditures by Function

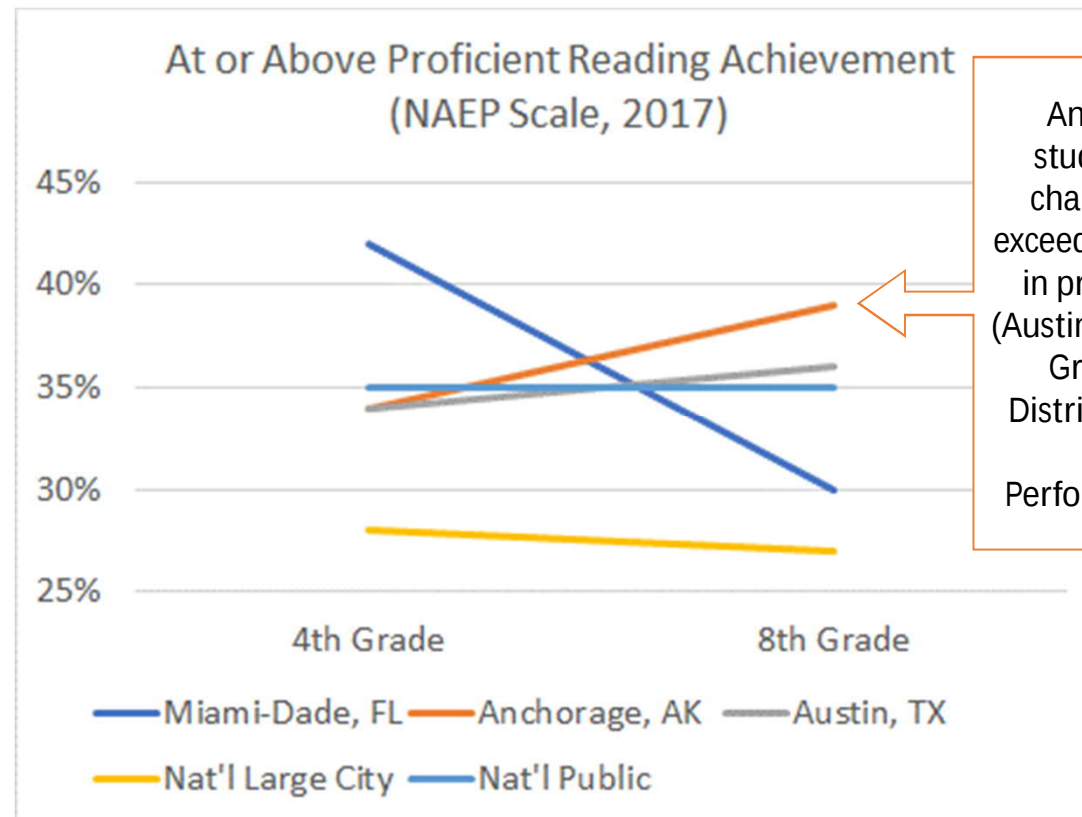
O&M as Percentage of Total State Program Expenditures (FY19)



4th to 8th Grade Reading Assessments

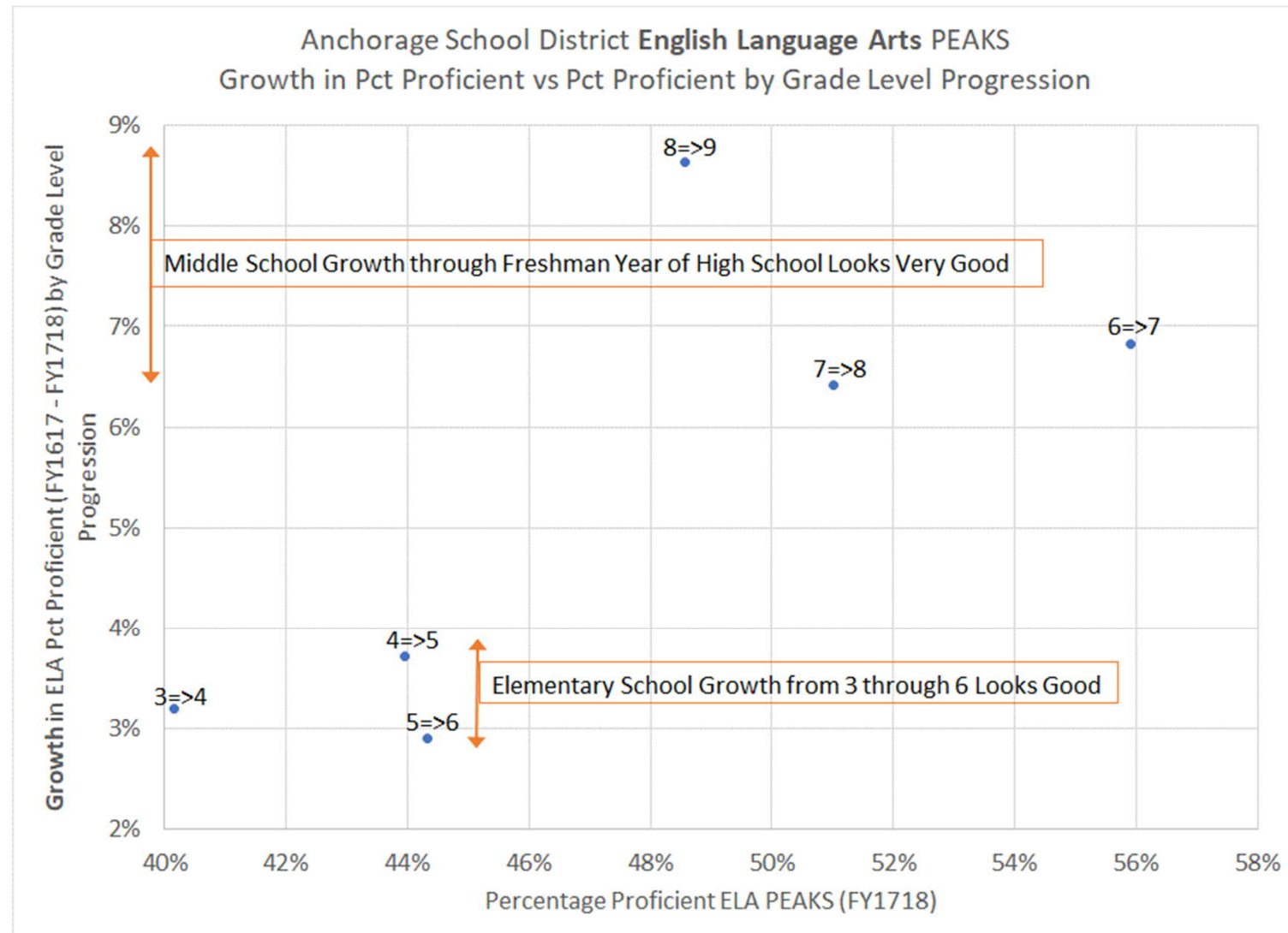
Council of Great City Schools Academic Key Performance Indicators Report (October 2018)

Normalized to
NAEP Scale
(2017)



Anchorage School District student reading proficiency change from 4th to 8th grade exceeds the top district in change in proficiency and proficiency (Austin, TX) among the Council of Great City Schools School Districts reporting NAEP scores (2018 Key Academic Performance Indicators Report)

3rd to 9th grade
English Language
Arts PEAKS
Assessments,
Year over Year
Growth &
Proficiency
Among Cohorts



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