



From: Adam Larsen, Assistant Superintendent

To: Board of Education

Cc: Thomas Mahoney, Superintendent

Re: Apr 2023 Board Report

Assessment Updates

Spring 2023 Testing

As the 2022-2023 school year draws to a close, students in many grade levels are participating in end-of-year assessments. The students in grades 3-8 are currently taking the Illinois Assessment of Readiness (IAR) test. Students in grades 5, 8, and 11 are also completing the Illinois Science Assessment (ISA) tests. Once these mandated tests are completed toward the end of April, there will be a short break before we conduct local FastBridge and MAP testing to compute growth for student goal tracking, program evaluation, and teacher Student Learning Objectives (SLOs).

SAT Correlations Predictions

Students in grades 9-11 at Oregon Junior/Senior High School took the state-administered PSAT and SAT assessments on Wednesday, April 12. We will receive the initial scores from College Board in about six weeks, while the data from ISBE will be available in the late summer or early fall. These scores are an important factor in the Every Student Succeeds Act (ESSA) ratings.

It had been a while since we last studied the correlations between the state-mandated assessments and demographic characteristics that might serve as predictors of those assessments. We had definitely not updated this work since adding the Horizon Education practice SAT assessments. While we were already thinking about SAT scores, it seemed like a good opportunity to conduct some applied research and compute some new numbers for these relationships.

I first wrote a query to pull the following metrics from the PowerSchool database during the 2021-2022 school year:

Variable	Name	Description
lii	Low Income Indicator	Lunch status: Free/Reduced (1) or Paid (0)
att	Attendance	Percentage of days in attendance during the entire year
discipline	Office Disciplinary Referrals	Number of referrals during the entire year
commsvc	Community Service Hours	Number of community service hours worked in the entire year
gpa_eng_weighted	Weighted English GPA	GPA (with added value) in English classes
gpa_math_weighted	Weighted Math GPA	GPA (with added value) in Math classes
gpa_cumulative_weighted	Weighted GPA	GPA (with added value) in all classes



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gpa_eng_simple	Simple English GPA	GPA (with added value) in English classes
gpa_math_simple	Simple Math GPA	GPA (with added value) in Math classes
gpa_cumulative_simple	Simple GPA	GPA (with added value) in all classes
activities	Extracurricular activities	Number of activities participated in during the year

These demographics characteristics were combined with the following six scores from practice and actual SAT assessments from Spring 2022:

Variable	Name	Description
Practice SAT total_scaled_score	Feb 2022 Practice Composite SAT	Horizon Education Practice Overall score
Practice SAT ebrw_scaled_score	Feb 2022 Practice SAT EBRW	Horizon Education Practice Evidence-Based Reading and Writing Section score
Practice SAT math_scaled_score	Feb 2022 Practice SAT Math	Horizon Education Practice Math Section score
SAT Total Score	Apr 2022 SAT Composite	SAT Overall score
SAT Evidence-Based Reading and Writing Section Score	Apr 2022 SAT EBRW	SAT Evidence-Based Reading and Writing Section score
SAT Math Section Score	Apr 22 SAT Math	SAT Math Section score

When these variables and scores were correlated with each other, the following matrix was computed:

	SAT Total Score	SAT Evidence-Based Reading and Writing Section Score	SAT Math Section Score
lii	-0.290923	-0.277675	-0.262934
att	0.193424	0.176416	0.182656
discipline	-0.172071	-0.145776	-0.173168
commsvc	0.350028	0.324303	0.325709
gpa_eng_weighted	0.549598	0.559233	0.463577
gpa_math_weighted	0.627215	0.575095	0.589398
gpa_cumulative_weighted	0.572999	0.545942	0.518793
gpa_eng_simple	0.446733	0.460190	0.371434
gpa_math_simple	0.555979	0.510553	0.521717
gpa_cumulative_simple	0.516523	0.491619	0.468150
activities	0.525338	0.429559	0.543505
Practice SAT total_scaled_score	0.894498	0.864927	0.791812
Practice SAT ebrw_scaled_score	0.851604	0.871817	0.706277
Practice SAT math_scaled_score	0.761487	0.663597	0.745582
SAT Total Score	1.000000	0.925162	0.931809
SAT Evidence-Based Reading and Writing Section Score	0.925162	1.000000	0.724308
SAT Math Section Score	0.931809	0.724308	1.000000

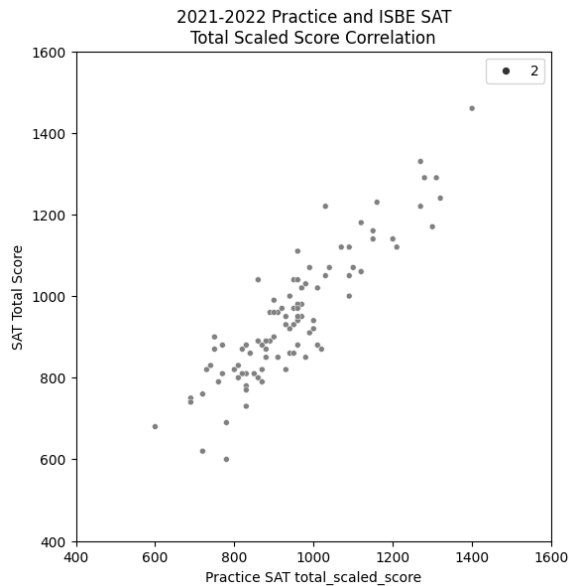


The attendance and community service variables demonstrated modest positive correlations with the final SAT scores. The low income indicator showed a modest negative correlation (the presence of the indicator—1—typically corresponded to lower SAT scores. The discipline factor demonstrated a weak negative correlation with SAT scores.

The GPA variables all demonstrated moderate positive correlations with the SAT outcomes. Students with higher GPAs, both subject and cumulative, showed higher SAT scores. The lowest correlations here were between off-subject GPAs and SAT scores. That is, the English GPA and math SAT scores showed the weakest relationships.

The relationships between the Feb 2022 practice SAT and the Apr 2022 ISBE SAT were remarkably strong. The correlation between the composite scores (+0.895), Evidence-Based Reading and Writing (+0.872), and Math (+0.746) are in the highest range that we see in social science research. This tells us that the practice SAT scores are quite strongly predictive of the real SAT that students take a few months later. Given that the service from the vendor is not very expensive and quite easy to give, this is a tool we will likely use for years to come.

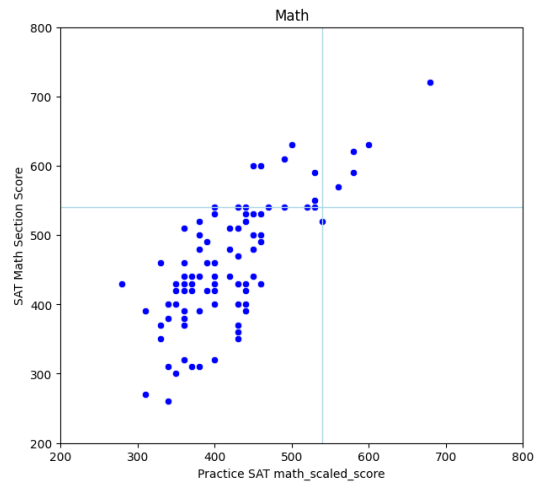
Scatterplot of practice and real SAT composite score





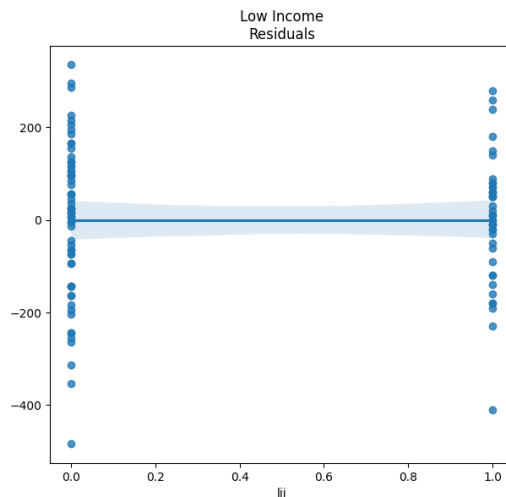
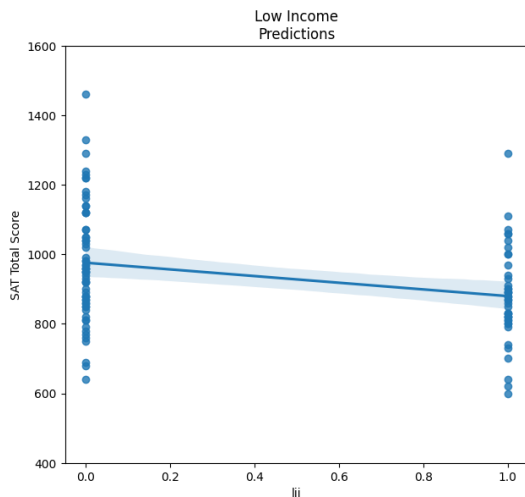
Scatterplots of practice and real SAT subject scores. The horizontal and vertical lines represent the cutoff for Meets Standards (scaled score of 540).

2021-2022 Practice and ISBE SAT Subject Score Correlations



While many of these factors showed modest or moderate correlations with the overall SAT scores, it is still important to inspect these relationships visually to see if they have any practical significance.

Low income. There is tremendous overlap between the two conditions, resulting in very little predictive utility.

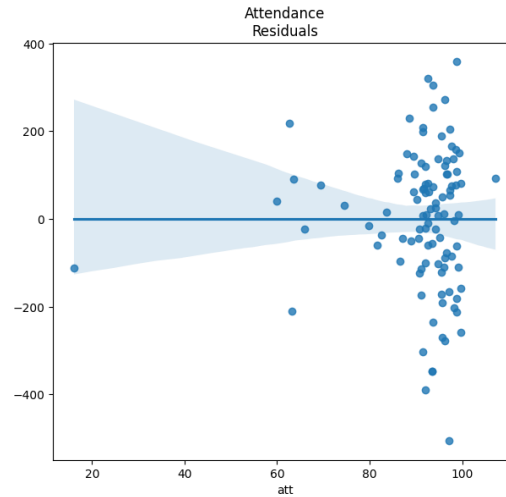
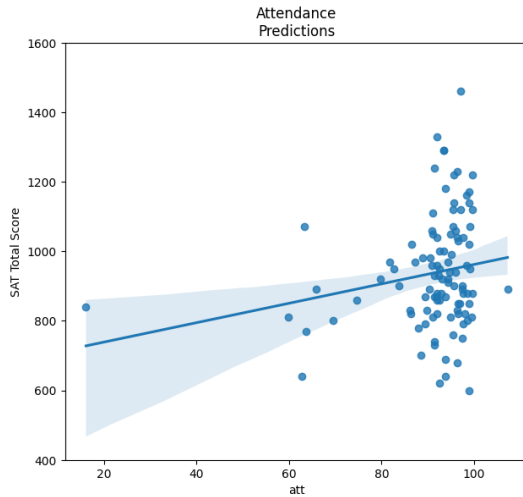


Attendance. This correlation was modest, but the bunching of attendance values toward the 100% mark reduces the utility of this metric.

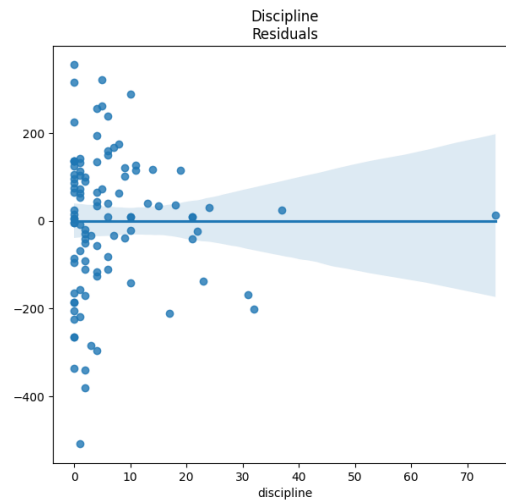
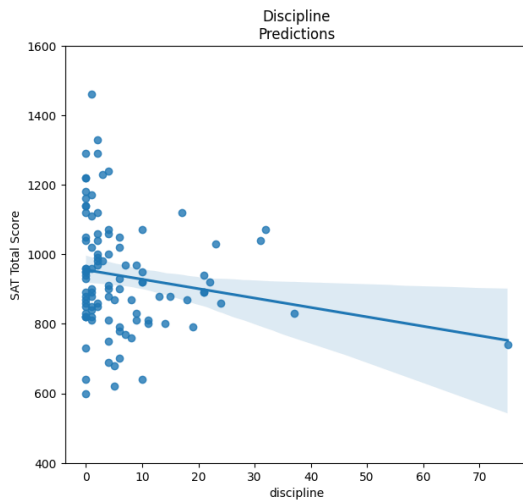


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Discipline. This is already a weak correlation, but the considerable leverage from the few outliers on the high end of the discipline counts bears a lot of the responsibility for the observed relationship.

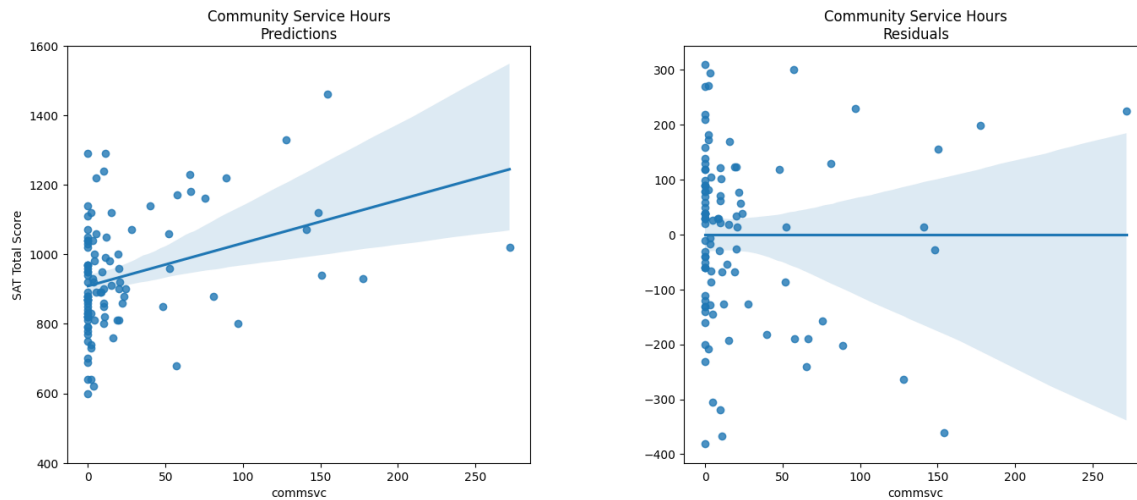




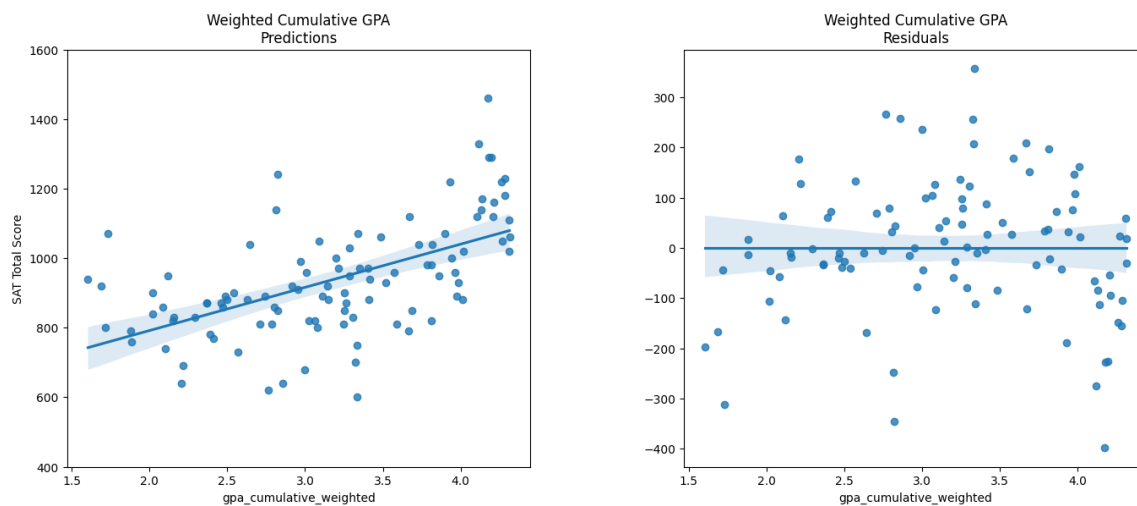
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Community Service Hours. This is a modest correlation that is affected greatly by the high number of students with zero hours and the few outliers who are on the high end.



Cumulative GPA. This is both a moderate correlation and one that has some predictive utility. Scores are distributed evenly, the residuals demonstrate no clear pattern, and the relationship appears to be straightforward and clear.

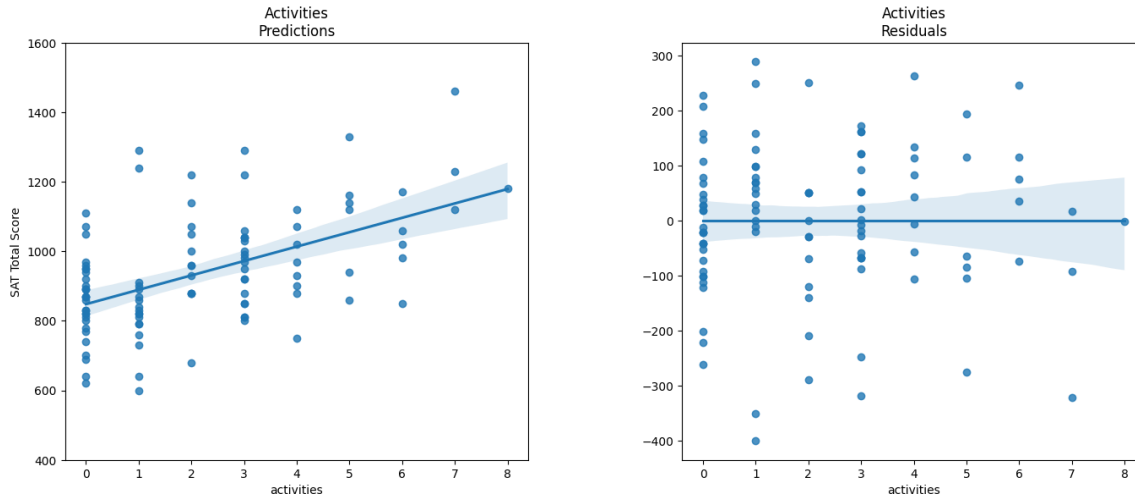


Extracurricular Activities. Some bunching occurs at X=0, but there is a demonstrable connection between being more involved and scoring higher on the SAT.



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None of these relationships make any causal claims about one variable impacting another. Rather, these likely demonstrate how a third variable (school success) affects each of these pairs of variables in a way that causes them to covary. The strongest relationships appear to be between the total SAT score and weighted cumulative GPA, activity involvement, and community service.

Respectfully Submitted,

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