

Using the SAT[®] to Support Student Success on Campus: What Have We Learned from Recent Research?

September 2021

The utility and value of SAT[®] scores extends beyond the admissions office in various ways to inform important campus decisions about retention, degree completion, scholarships, and students' areas of academic weaknesses that need strengthening. This document summarizes findings from recent studies that inform these conversations and can guide campus use of SAT scores to promote student success.

Introduction

SAT scores are intended to be useful for much more than college admission decisions (College Board, 2017). The SAT was redesigned in 2016 to better reflect the work that students do in high school, focusing on the core knowledge and skills that research has shown to be critical for students to be ready for college and career.

SAT scores provide insight about students' academic success in several areas by:

- Predicting student retention rates;
- Identifying students who may benefit from academic support services;
- Placing students who may excel or need enrichment in particular academic domains, including math, English, history/social studies, and science;
- Identifying students for honors programs or academic scholarships; and
- Predicting and supporting student success within academic majors (Marini et al., 2019; Westrick et al., 2019, 2020, 2021).

Research on a robust national data set shows that SAT scores have significant value in providing insight and actionable information to improve students' academic success. Specifically:

- SAT scores show a positive relationship with retention to the second year of college at the same institution.
- Even among students with high HSGPAs, we see substantial differences in student

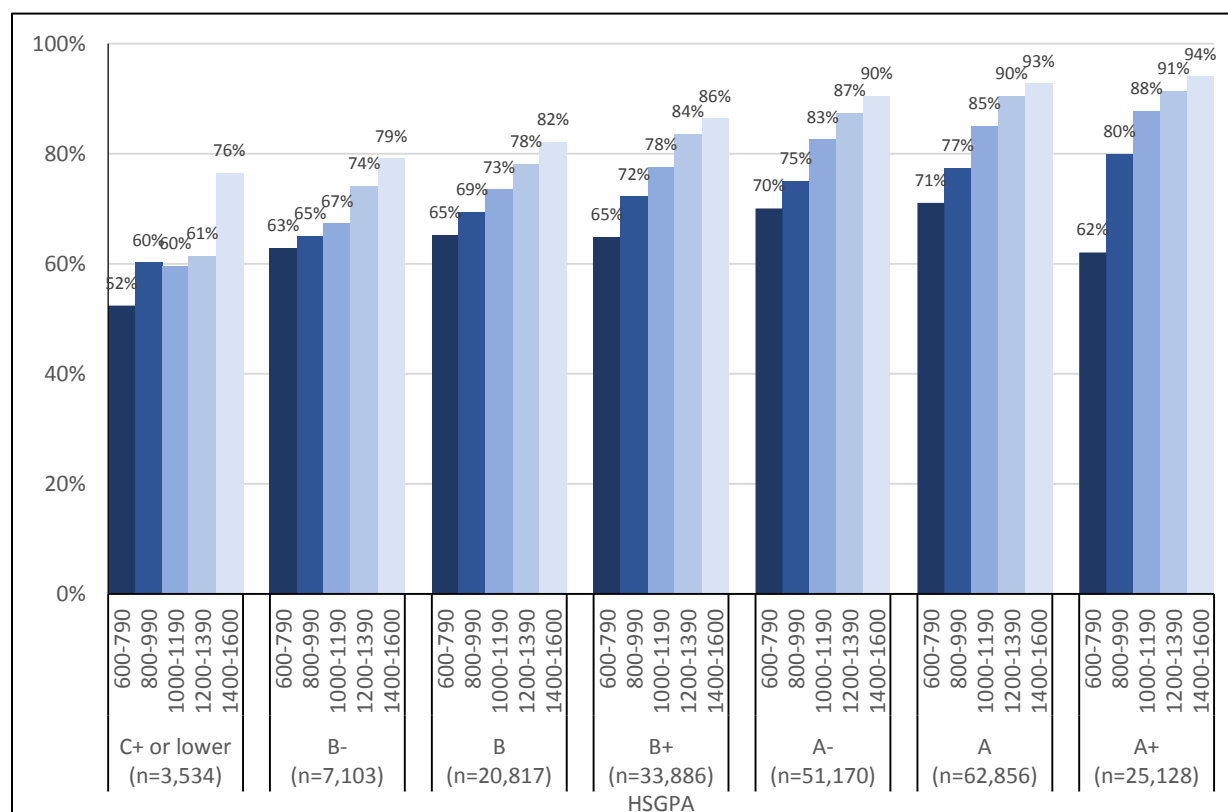
retention rates that are revealed by SAT scores.

- The combination of HSGPA and SAT scores provides a more complete and accurate understanding of student academic performance and retention in college compared to either metric used in isolation.
- Students who underperform in college—compared to their predicted performance based on HSGPA and SAT—are at greater risk for departure from college compared to students who perform as expected. Using this information in targeted interventions can improve retention rates.
- The strategic use of HSGPA and SAT scores provides colleges and universities with an opportunity to target students at risk for departure with pivotal academic resources and assistance, and boost institutional completion rates.
- SAT Math and SAT Evidence-Based Reading and Writing (ERW) scores are effective tools to help place students in first-year college courses within similar academic domains.
- SAT scores provide critical information above HSGPA to understand top student performance in college, which greatly informs scholarship decisions and honors program decisions.
- The joint use of the SAT and HSGPA is always better than using the SAT or HSGPA alone to predict cumulative GPA, across the different academic majors studied. Accurately understanding how students may be expected to perform in a major not only helps an institution to appropriately plan for departmental resources, but also to target academic support and additional instruction most effectively to students who need it most.
- SAT scores can be used to increase the diversity of the student body in STEM fields by helping institutions to confidently admit the students they are most interested in to shape a class in keeping with their mission and goals, while remaining fully aware of which students may benefit from additional instructional support in the major to maximize their success in college and beyond.

Identifying Students at Risk for Not Returning

Combining HSGPA and SAT information reveals critical insights about student retention in college that are not evident when using either measure alone. SAT scores contextualize the meaning of a HSGPA and how that HSGPA ultimately translates to college performance. Even students with very high HSGPAs show substantial differences in retention when SAT scores are used to assess retention to the institution.

Figure 1. Mean Second-Year Retention Rate by HSGPA and SAT Total Score Bands



Source: Westrick, P. A., Marini, J. P., Young, L., Ng, H., Shmueli, D., & Shaw, E. J. (2019). *Validity of the SAT® for Predicting First-Year Grades and Retention to the Second Year* (College Board Research Report). New York: College Board.

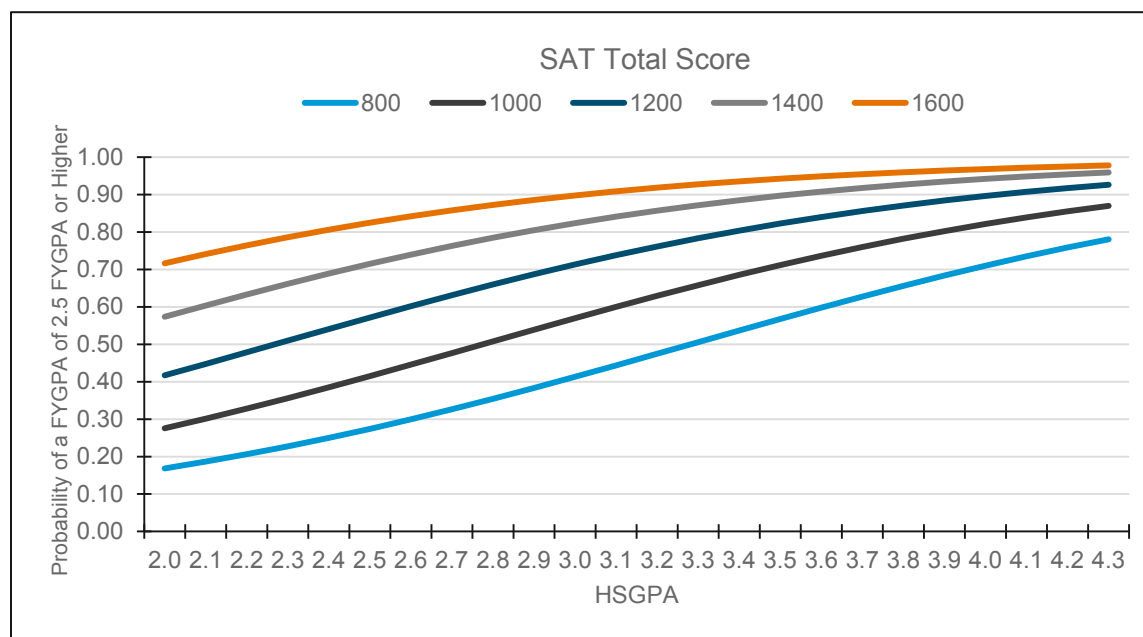
Key Takeaways

- Understanding retention rate differences by HSGPA and SAT scores alerts faculty and staff to students who may benefit from academic intervention and, as a result, stand a better chance of completing their educational goals.
- This figure shows a positive relationship between SAT scores and retention across all HSGPA categories (controlling for HSGPA), but especially so for students within the A and B HSGPA categories who represented more than 98% of the study sample (based on more than 223,000 students across 171 four-year institutions).
- For example, students with a HSGPA of A but with an SAT score between 800–990 have an average second-year retention rate of 77%, while the same A students with an SAT score between 1400–1600 have a 93% retention rate.

Using HSGPA and SAT scores to predict future academic success identifies students who may benefit from academic support programs to succeed in their

first year of college. Absent SAT scores, HSGPA information alone is not sufficient to identify whether students may need additional academic supports to be successful in their first year of college.

Figure 2. Probability of a 2.50 or Higher FYGPA Given HSGPA and SAT Total Score



Source: Westrick, P. A., Marini, J. P., Young, L., Ng, H., Shmueli, D., & Shaw, E. J. (2019). *Validity of the SAT[®] for Predicting First-Year Grades and Retention to the Second Year* (College Board Research Report). New York: College Board.

Key Takeaways

- SAT scores provide meaningful information in predicting a student's probability of earning a 2.50 or higher FYGPA in college at every point on the HSGPA scale.
- Even among students with higher HSGPAs we see the added SAT value in understanding student success in college.
- This figure shows students' probability of earning a FYGPA of 2.50 or higher in college given their HSGPA and selected SAT Total score. For example, a student with a HSGPA of 3.00 and SAT Total score of 1000 has approximately a 57% chance of earning a FYGPA of 2.50 or higher, while a student with the same HSGPA (3.00) and SAT Total score of 1400 has approximately an 82% chance of earning a FYGPA of 2.50 or higher.

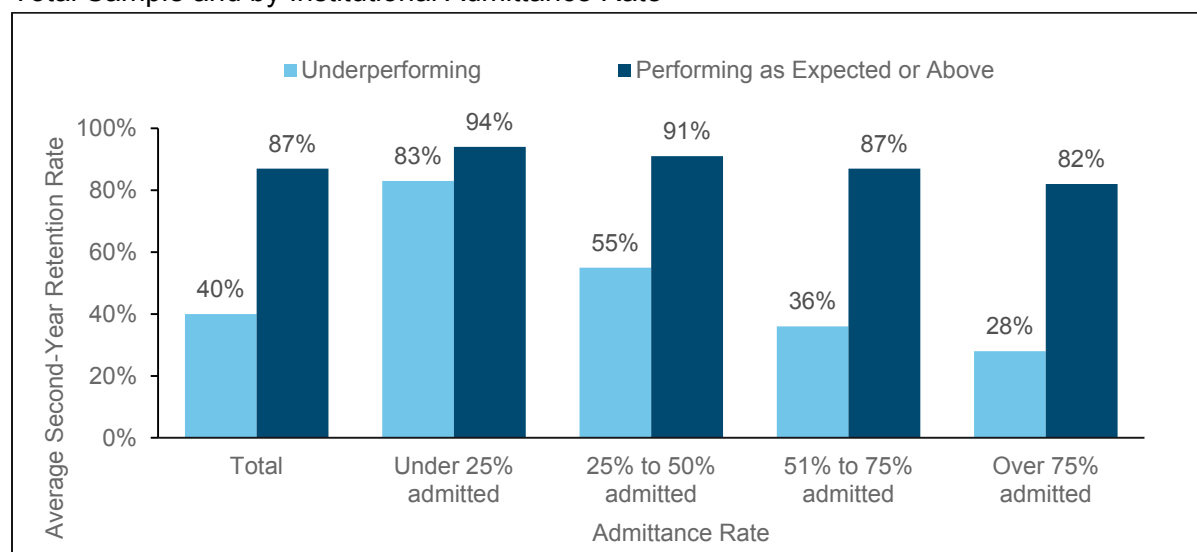
Tracking Student Progress and Performance

Arriving at a predicted FYGPA for students using both HSGPA and SAT scores is an effective tool to identify students who may be at risk for not returning to college.

The difference between a student's actual and predicted performance (based on SAT scores and HSGPA) during the first year can be used to categorize students into two groups—those who performed as well as predicted or better and those who underperformed from what was expected. Students who greatly underperform are students who earn grades in college that are much lower than predicted by their high school performance, and these students depart college at higher rates than do other students (Shaw & Mattern, 2013).

Note that not all students classified as underperforming, and therefore at risk for departure, have a low FYGPA. In the most recent study on this (Westrick et al., 2019), 24% of the students classified as underperforming had a FYGPA of 2.00 or higher, a FYGPA that many consider an acceptable minimum for avoiding academic probation. For example, a student predicted to earn a FYGPA of 3.80 but who earned a FYGPA of 2.25 would be in good academic standing, but by utilizing their predicted performance (based on SAT scores and HSGPA) the student could be flagged as being at-risk for departure due to greatly underperforming.

Figure 3. Retention Rates of Students Underperforming and Performing as Expected or Better, Total Sample and by Institutional Admittance Rate



Source: Westrick, P. A., Marini, J. P., Young, L., Ng, H., Shmueli, D., & Shaw, E. J. (2019). *Validity of the SAT[®] for Predicting First-Year Grades and Retention to the Second Year* (College Board Research Report). New York: College Board.

Key Takeaways

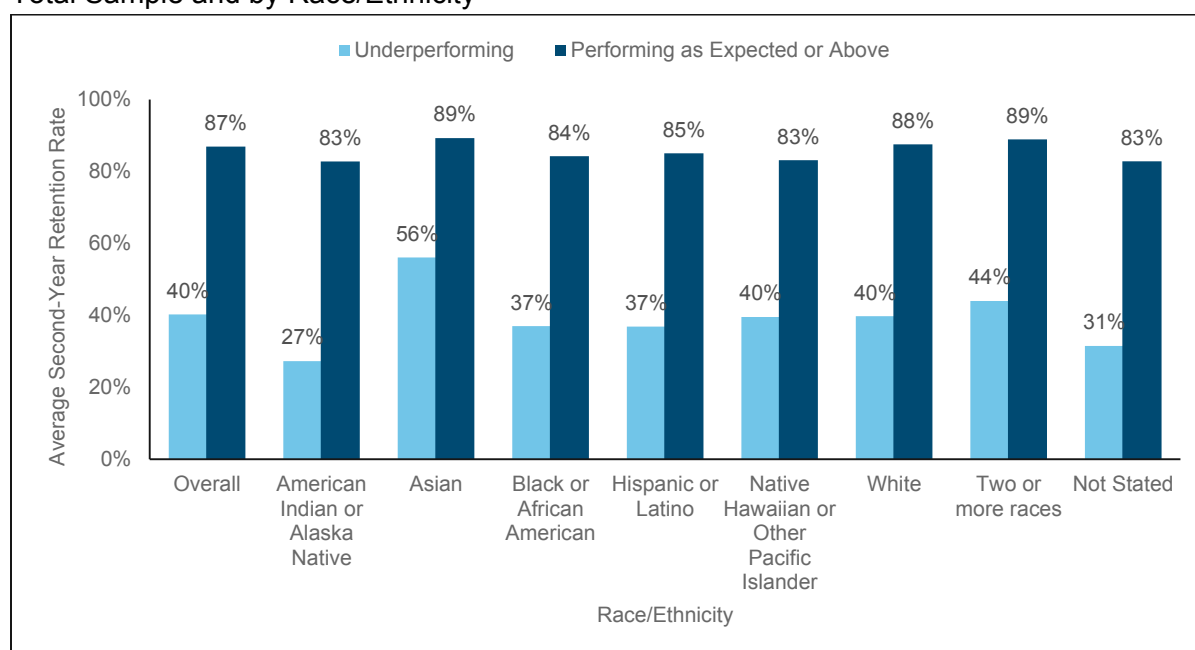
- Accurate prediction is essential in promoting student retention at an institution. Accepting students and positioning them for success based on the

information one has about them (e.g., determining possible supports needed) is a key strategy for successful institutional retention and completion initiatives.

- This figure shows retention rates for students who underperform and those performing as well as expected or above. This chart shows higher retention rates when students perform as expected or better.
- Overall, 87% of students who performed as expected or above returned for the second year, while only 40% of students who underperformed returned for the second year.
- This is especially true at less selective institutions, as the likelihood of underperforming students returning for the second year dramatically decreases as institutional admission selectivity decreases.

Calculating the difference between the predicted and actual FYGPA to identify underperforming students is a useful tool to identify and improve underrepresented minority student retention rates.

Figure 4. Retention Rates of Students Underperforming and Performing as Expected or Above, Total Sample and by Race/Ethnicity



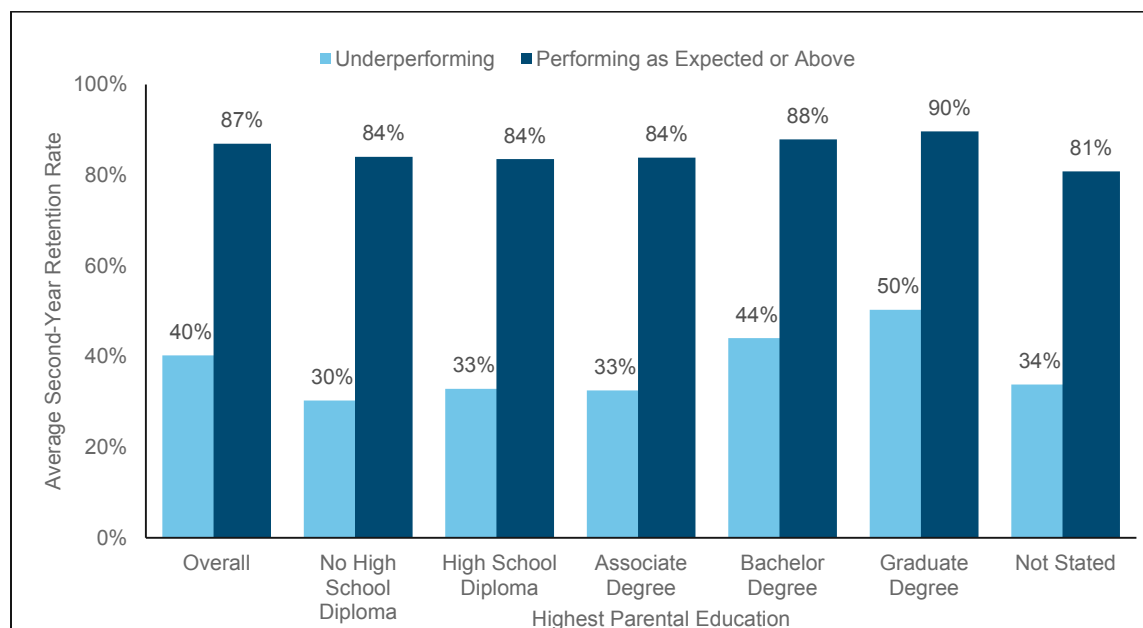
Source: Marini, J. P., Westrick, P. A., Young, L., Ng, H., Shmueli, D., & Shaw, E. J. (2019). *Differential Validity and Prediction of the SAT[®]: Examining First-Year Grades and Retention to the Second Year* (College Board Research Report). New York: College Board.

Key Takeaways

- Retention rates for those students performing as expected or above range from 83%–89% across all race and ethnicities. The largest difference in retention rates between students who underperform and those who perform as expected or above is seen in American Indian and Alaska Native students (27% vs. 83%).
- The smallest differences are seen in Asian students (56% vs. 89%) and those identifying as Two or More Races (44% vs. 89%). Furthermore, when compared to the overall rates in the sample (40% vs. 87%), underrepresented minority students have lower retention rates in both categories.

Calculating the difference between the predicted and actual FYGPA to identify underperforming students is a useful tool to identify and improve first-generation college student retention rates.

Figure 5. Retention Rates of Students Underperforming and Performing as Expected or Above, Total Sample and by Highest Parental Education Level



Source: Marini, J. P., Westrick, P. A., Young, L., Ng, H., Shmueli, D., & Shaw, E. J. (2019). *Differential Validity and Prediction of the SAT®: Examining First-Year Grades and Retention to the Second Year* (College Board Research Report). New York: College Board.

Key Takeaways

- The likelihood of underperforming students returning for the second year dramatically decreases as parental education level decreases, indicating that examining underperformance as a risk factor for not returning may be particularly helpful for students whose parents have not earned a bachelor's

degree.

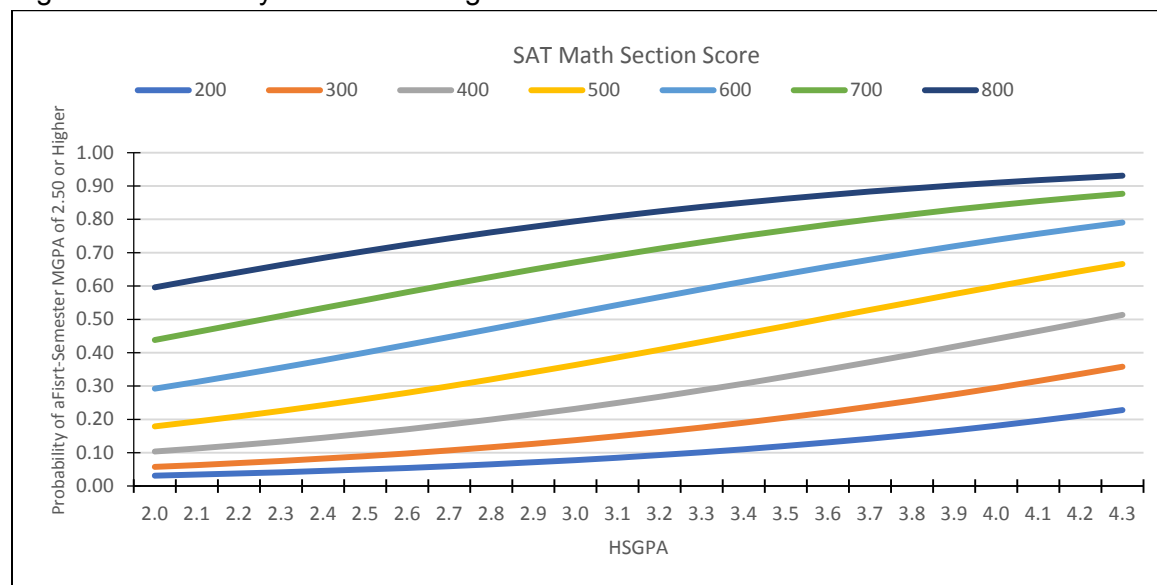
- Students who have parents with bachelor's degrees (44% vs. 88%) and those with graduate degrees (50% vs. 90%) have higher mean retention rates than the full sample (40% vs. 87%) in both categories of student performance. The lowest rates are seen when a student's parents have no high school diploma (30% vs. 84%).

Course Placement and Identifying Students Who May Benefit from Targeted Academic Support

SAT scores provide valuable information about how students are expected to perform in the matching academic domain in college, which can improve placement decisions and strengthen advising conversations on campus.

The SAT Math section provides important information beyond HSGPA regarding student preparedness for math coursework and is an effective tool for placing students in appropriate college-level math courses. The combination of HSGPA and SAT Math scores provides a more complete and accurate understanding of student performance in math.

Figure 6. Probability of a 2.50 or Higher Math GPA Given HSGPA and Math Section Score



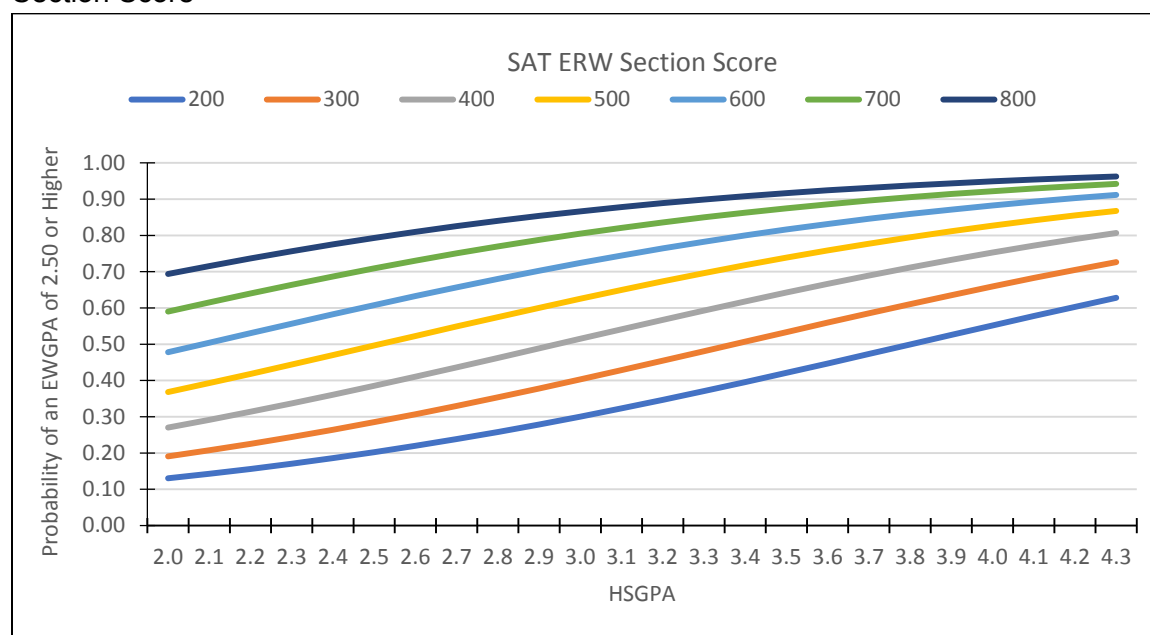
Source: Westrick, P. A., Marini, J. P., Young, L., Shmueli, D., Ng, H., & Shaw, E. J. (2020). *Validity of the SAT® for Predicting First-Semester, Domain-Specific Grades* (College Board Research Report). New York: College Board.

Key Takeaways

- SAT Math scores provide meaningful information in predicting a student's probability of earning a 2.50 or higher in college-level math at every point on the HSGPA scale.
- Even among students with the highest HSGPAs, we see the added SAT Math value in understanding student math success in college.
- This figure shows students' probability of earning a first semester math GPA of 2.50 or higher in college given their HSGPA and selected SAT Math score. For example, a student with a HSGPA of 3.00 and SAT Math score of 500, has approximately a 36% chance of earning a math GPA of 2.50 or higher, while a student with the same HSGPA (3.00) and SAT Math score of 700 has an approximately 67% chance of earning a math GPA of 2.50 or higher.

The SAT Evidence-Based Reading and Writing (ERW) section provides important information beyond HSGPA regarding student preparedness for English and writing coursework and is a useful tool to place students in appropriate college-level composition courses. The combination of HSGPA and SAT ERW scores provides a more complete and accurate understanding of students' performance in English.

Figure 7. Probability of a 2.50 or Higher English and Writing GPA Given HSGPA and SAT ERW Section Score



Source: Westrick, P. A., Marini, J. P., Young, L., Shmueli, D., Ng, H., & Shaw, E. J. (2020). *Validity of the SAT[®] for Predicting First-Semester, Domain-Specific Grades* (College Board Research Report). New York: College Board.

Key Takeaways

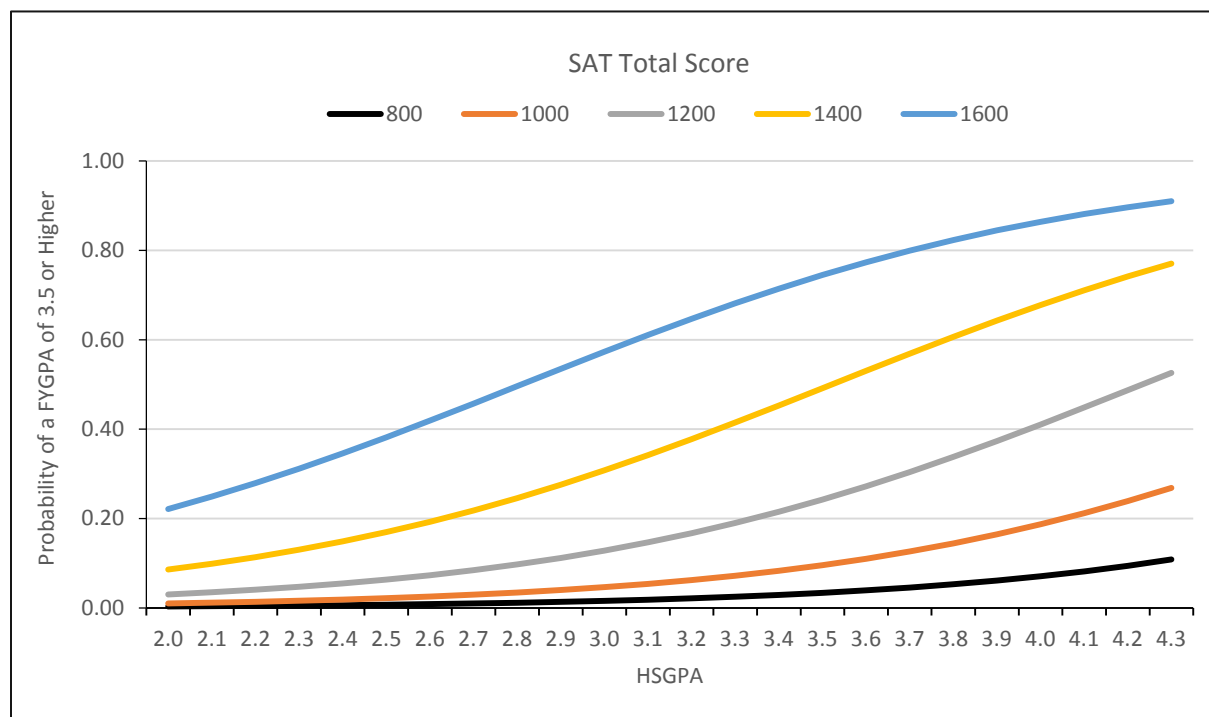
- SAT ERW scores provide meaningful information in predicting a student’s probability of earning a 2.50 or higher in college-level English and writing at every point on the HSGPA scale.
- Even among students with the highest HSGPAs, we see the added SAT ERW value in understanding student English and writing success in college.
- This figure shows students’ probability of earning a first semester English and writing GPA of 2.50 or higher in college given their HSGPA and selected SAT ERW score. For example, a student with a HSGPA of 3.00 and SAT ERW score of 500, has approximately a 63% chance of earning an English and writing GPA of 2.50 or higher, while a student with the same HSGPA (3.00) and SAT ERW score of 700 has an approximately 80% chance of earning an English and writing GPA of 2.50 or higher.

Selecting Students for Merit-Based Scholarship Decisions and Competitive Academic Programs

With the vast majority of college students earning an “A” HSGPA, the SAT provides critical, additive information about which students will be among the very highest performers in college.

Colleges can use SAT scores to confidently identify admitted students with the highest probabilities of earning the grades required to retain scholarships and participate in honors programs. Colleges can also use SAT scores to identify students who may benefit from additional academic support and mentoring to ensure that they retain their scholarship funding and participation in honors programs beyond the first year.

Figure 8. Probability of Earning a 3.50 or Higher First Year College GPA, by High School Grades and SAT Score



Source: Westrick, P.A., Marini, J.P., & Shaw, E.J. (2020). *Using the SAT[®] in merit-based scholarship decisions and selection for competitive academic programs* (College Board Research Report). New York: College Board.

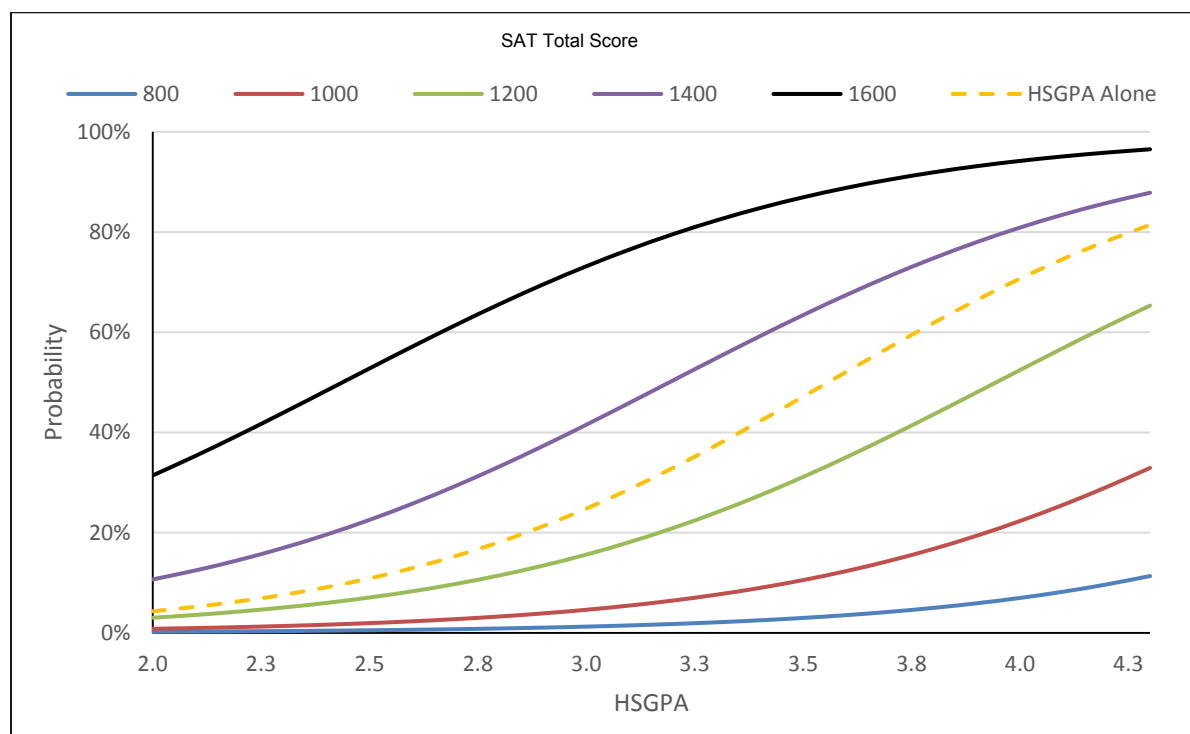
Key Takeaways

- SAT scores provide meaningful information in predicting a student's probability of earning a very strong FYGPA (3.50 or higher) across every point on the HSGPA scale. While a FYGPA of 3.50 is a high threshold for thinking about college success, when the selection decision is for competitive scholarships and academic programs, this is a sensible outcome to examine.
- Even among students with the highest HSGPAs, we see the added SAT value in understanding very strong academic performance in the first year of college.
- This figure shows students' probabilities of earning a FYGPA of 3.50 or higher in college given their HSGPA and selected SAT score. For example, even among students with a HSGPA of 4.00, their probability of earning a FYGPA of 3.50 or higher is at around 40% if their SAT score is a 1200, about 70% if their SAT score is a 1400, and nearly 90% if their SAT score is a 1600.

Informing Academic Major-Related Decisions and Planning on Campus

SAT scores are useful for predicting student performance in various college majors, helping colleges to better support all students to be as successful as possible in their chosen academic programs.

Figure 9. Engineering: Probability of Earning a Second-Year Cumulative College GPA of 3.00 or Higher, by High School Grades and SAT Score



Source: Westrick, P.A., Marini, J.P., & Shaw, E.J. (2021). *Using SAT[®] scores to inform academic major-related decisions and planning on campus* (College Board Research Report). New York: College Board.

Key Takeaways

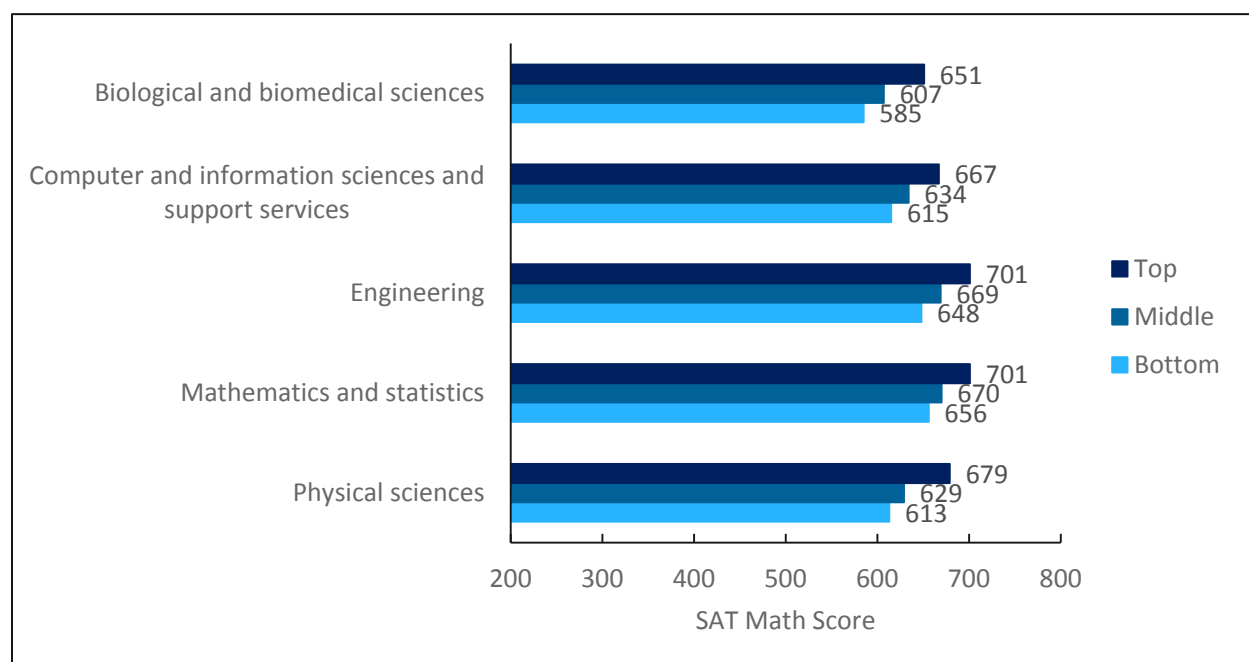
- The joint use of the SAT and HSGPA is better than using the SAT or HSGPA alone to predict cumulative GPA across the different academic majors studied.
- As an example in the figure above, for Engineering majors, SAT scores provide highly meaningful information in predicting a student's probability of earning a 3.00 or higher second-year cumulative GPA (cumGPA) across every point on the HSGPA scale.
- When using HSGPA alone to understand the Engineering student's college performance, those students with a HSGPA of 4.0, have a 71% chance of earning a second-year cumGPA of 3.00 or higher. However, for Engineering students with a

HSGPA of 4.0 and SAT scores of 1000, 1200, and 1400, their chances of earning a second-year cumGPA of 3.0 or higher are 22%, 52%, and 81%, respectively.

Not all HSGPAs hold the same meaning and SAT scores further contextualize HSGPA for improved use on campus, and in different ways by academic department – where grading standards vary quite a bit and impact score relationships with college GPAs.

SAT scores can also be used to increase the diversity of students majoring in the STEM fields. ***As colleges invest in efforts to diversify majors, like those in the STEM fields, the SAT can help colleges ensure that academic supports reach students who are predicted to struggle academically early in their major courses, enabling them to be more successful and persist in those STEM majors.***

Figure 10. Mean SAT Math Score by STEM Major, Disaggregated by Top, Middle, and Bottom Thirds on Second-Year Cumulative GPA



Source: Westrick, P.A., Marini, J.P., & Shaw, E.J. (2021). *Using SAT® scores to inform academic major-related decisions and planning on campus* (College Board Research Report). New York: College Board.

Key Takeaways

- This graph shows the mean SAT math scores for the five STEM majors examined in this study, after dividing the student sample into the top, middle, and bottom third of second-year cumulative GPA performance.
- For students in the bottom third of cumGPA performance, many have mean SAT Math scores that are quite respectable when considering national norms. However, within their

academic majors, these SAT Math scores are reflective of students who are not performing as well as two-thirds of their peers who had even higher SAT scores.

- The SAT can be used to increase the diversity of the student body in STEM fields by helping institutions to confidently admit the students they are most interested in to shape a class in keeping with their mission and goals, while remaining fully aware of which students may benefit from additional instructional support in the major field, informed by their SAT scores, in order to maximize their success in college and beyond.

Conclusion

Beyond the admissions office, the SAT adds significant value beyond HSGPA in identifying students at risk for not returning, tracking student progress and performance to understand who may benefit from additional support to remain on track to earn their degree, making course placement decisions and setting placement policies, selecting students for academic scholarships or competitive honors programs, and understanding areas of student academic strength and weakness. As the fall 2017 entering college cohort continues to progress through college, we will continue to study relationships between SAT scores and later college outcomes and share those results as they are available.

References

College Board. (2017). *SAT[®] suite of assessments technical manual: Characteristics of the SAT*. New York: College Board.

Marini, J. P., Westrick, P. A., Young, L., Ng, H., Shmueli, D., & Shaw, E. J. (2019). *Differential validity and prediction of the SAT[®]: Examining first-year grades and retention to the second year* (College Board Research Report). New York: College Board.

Shaw, E. J., & Mattern, K. D. (2013). Examining student under- and overperformance in college to identify risk of attrition. *Educational Assessment*, 18(4), 251–268.

Westrick, P.A., Marini, J.P., & Shaw, E.J. (2021). *Using SAT[®] scores to inform academic major-related decisions and planning on campus* (College Board Research Report). New York: College Board.

Westrick, P.A., Marini, J.P., & Shaw, E.J. (2020). *Using the SAT[®] in merit-based scholarship decisions and selection for competitive academic programs* (College Board Research Report). New York: College Board.

Westrick, P., Marini, J. P., Young, L., Ng, H., Shmueli, D., & Shaw, E. J. (2019). *Validity of the SAT[®] for predicting first-year grades and retention to the second year* (College Board Research Report). New York: College Board.

Westrick, P. A., Marini, J. P., Young, L., Shmueli, D., Ng, H., & Shaw, E. J. (2020). *Validity of the SAT[®] for predicting first-semester, domain-specific grades* (College Board Research Report). New York: College Board.

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