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Using the SAT[®] to Support Student Success in the Transition to College

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Abstract

The transition from high school to college can be challenging for some students, as the structured nature of high school gives way to an expectation of self-direction. Academic advising and support services, provided by colleges and universities, can ease this transition and promote stronger student outcomes. Efficiently and accurately identifying which students would most benefit from early academic advising and support can allow institutions to intervene sooner and allocate advisors' caseloads more appropriately, raising the quality of support each student receives and, in turn, improving second-year retention and ultimately completion. As not all institutions can develop sophisticated or complex predictive models to identify students for advising, this study examined how well institution-specific 5th, 10th, and 15th percentiles of SAT Total score as well as high school GPA (HSGPA), can identify students whose subsequent college performance suggests they would benefit from institutional academic outreach. Results showed that students who fell below both the SAT and HSGPA thresholds identified at the different levels had the weakest academic performance, followed by those identified by SAT score alone. Students with SAT scores and HSGPAs below the 15th percentiles at their college were more than three times as likely as their peers above the 15th percentile to earn D, F, or W grades in their first semester, and had 10% lower retention rates. Findings suggest that the SAT can play a highly useful role in simply identifying students for one-on-one advising programs, summer bridge programs, special first-year seminars, and living-learning communities that are focused on improving early academic outcomes in college which are predictive of student retention and graduation.

Introduction

When students enter college they are faced with an abrupt withdrawal of the structured support systems they've relied on throughout adolescence. Where high school provided consistent scaffolding, such as parental oversight, teacher proximity, and routine, college requires self-directed functioning before many students have developed the skills to sustain it (Arnett, 2000; Zimmerman, 1990). Early, well-placed support can be the deciding factor between a student who persists and one who withdraws.

Academic advisors can have a substantial impact to make this transition easier. The type or model of academic advising can vary by institution with larger institutions having staff positions that are solely used to interact with students and provide support for them on their academic pathway from entry to graduation. Full-time academic advisors can have many students in their caseload. Academic advisors support struggling students by reaching out proactively rather than waiting for students to seek help, and teaching skills

rather than just issuing instructions, with concrete delivery formats such as one-on-one meetings, group sessions, study-skills instruction, and referrals to campus resources. In practice, this means the advisor diagnoses what's holding a student back (academic, financial, or personal), builds a realistic plan to keep them or get them back on track, and monitors progress rather than intervening only once (NACADA, 2006). This proactive model, reaching students before they fail rather than after, has been shown to raise persistence relative to reactive, appointment-only advising (Bettinger & Baker, 2014).

Research has shown that advisor effectiveness improves once caseloads fall below 300, a figure often invoked as a sustainable ceiling (Tyton Partners, 2021) that is roughly consistent with The Global Community for Academic Advising's (NACADA) reported national median of 296 (NACADA, 2011). Such caseloads assume a mix of need, with many students requiring little or no support. The subset requiring intensive support is far smaller, estimated at around 5% of the total caseload (EAB, 2024). A large multi-institution trial of intensive, proactive advising found no average effect on persistence or graduation, but the intervention succeeded at the one site that delivered it with fidelity, centralized advising, manageable caseloads, and mature early-alert systems, where gains concentrated among the students who received the most support (Rossman et al., 2023). This pattern suggests that the returns to proactive advising depend less on offering it broadly than on directing it, through good early-identification tools, to the students most likely to benefit.

With limited resources available for academic advisors to provide high-quality support, understanding which students most need early support can help allocate resources to students who would benefit most. Much of the literature focuses on academic indicators to detect students who are struggling in current coursework, such as active engagement in learning management systems, course-grades, or course-withdrawals. There is less known about pre-enrollment indicators that could be used to identify students who may need additional support. Students who start off with lower first-semester or first-year outcomes have much lower rates of completion and are less likely to raise their cumulative college GPA over time (Gershenfeld et al., 2015; Westrick et al., 2023), further showing the need for intervening early and the role that advisors can play to improve retention and ultimately completion.

Prior research on this has focused on high school grades, class rank, or grade point average (GPA) as primary access points to this data. Recently, there has been some concern about students not being prepared for college coursework and that high school grades alone do not offer sufficient ability to discriminate between students (Denning et al., 2026; Sanchez, 2024, 2025; Sanchez & Moore, 2022; Senate-Administration Working Group on Admissions [SAWG], 2025; Westrick et al., 2024). Standardized test scores can offer another data point for institutions and academic advisors to use to help identify students who may benefit from additional support (Chen & Sanchez, 2024; Friedman,

Sacerdote, Staiger, & Tine, 2025; Marini, Shaw, & Guzman, 2026; Sanchez, 2024). In addition, student demographic characteristics, such as first-generation college students or socioeconomic status (SES), could provide additional information for institutions to make informed advising decisions to increase the early success of students (American Sociological Association, 2022; Engle & Tinto, 2008; Weisen et al., 2024).

This study examines whether and how SAT scores can help institutions efficiently and accurately identify students who need academic advising or special monitoring early in college. These scores are available either during admission or after enrollment, before students arrive on campus. The aim is to give institutions simple, actionable evidence for spotting at-risk students as they begin their college experience. The use of the SAT alone and with HSGPA can offer institutions the ability to smartly allocate academic advising resources and keep the caseload of students to advisors at a manageable level to promote student retention, and ultimately completion.

Methodology

Sample

To be included in the study sample, students had to have graduated high school in spring 2023 and enrolled in college in fall 2023. Students had to have a valid SAT score, a self-reported high school GPA, and a first-year college GPA in the College Board's Higher Education Validity database. A total of 100,236 students met these criteria to be included in the study across 61 four-year colleges and universities.

Table 1 shows the student sample by their demographic characteristics. Overall, a larger percentage of the sample were female (57%) and a majority of the sample identified as not an underrepresented minority (non-URM; 71%). A large percentage of the sample was not a first-generation college student (77%) and a majority of the sample said that English was their best language (85%).

Table 1: Student Sample by Demographic Characteristics

	Group	n (%)
Gender	Female	57,380 (57%)
	Male	42,856 (43%)
First Generation	First Generation	18,871 (19%)
	Not First Generation	76,981 (77%)
	No Response/Missing	4,384 (4%)
URM Status	URM	28,969 (29%)
	Non-URM	71,267 (71%)
Best Language	English Only	84,874 (85%)
	English and Another	13,255 (13%)
	Another Language	1,050 (1%)
	No Response	1,057 (1%)

Institutional Characteristics

Institutional characteristics of those in the study sample are shown in [Table 2](#). Most institutions admit 51% or more of their applicants (72%). About half of the institutions identified as Private. Most of the institutions were either small (Under 5,000; 41%) or very large institutions (20,000+; 36%).

Table 2: Institutional Sample Characteristics

	Group	n (%)
Admit Rate	Under 25%	7 (11%)
	25%-50%	10 (16%)
	51%-75%	16 (26%)
	Over 75%	28 (46%)
Control	Public	31 (51%)
	Private	30 (49%)
Undergraduate Enrollment	Small ($n < 5,000$)	25 (41%)
	Medium ($5,000 \leq n < 9,999$)	5 (8%)
	Large ($10,000 \leq n < 19,999$)	9 (15%)
	Very Large ($n \geq 20,000$)	22 (36%)

Measures

SAT scores. SAT Total scores are on a 400 to 1600 scale with 10-point increments. SAT scores were obtained from College Board's database for the spring 2023 graduating high school cohort. The SAT scores included in this study are SAT Total score, sample mean of 1171 (SD=184), SAT Reading and Writing (RW) score (200 to 800 scale) sample mean of 591 (SD=91), and SAT Math score (200 to 800 scale) sample mean of 581 (SD=104). Note that the entire sample of SAT-takers in the 2023 graduating high school cohort had an SAT RW mean of 520 and an SAT Math mean of 508.

High School GPA. Students' self-reported HSGPA was obtained from the SAT Questionnaire when they registered for the SAT and is reported on a 12-point interval scale, ranging from 0.00 (F) to 4.33 (A+). The sample mean self-report HSGPA was 3.79 (SD = 0.45).

College Retention. College retention information was obtained from the National Student Clearinghouse (NSC) and linked to the study sample of students. A student was considered retained if they enrolled at the same institution in the Fall 2023 and Fall 2024 semesters. If a student was missing NSC information, they were not included in the retention analyses. The sample mean retention rate was 88% (SD = 33%).

First-year and first-semester course grades. First-year and first-semester coursework information, including grades, was obtained from the institutions in our study sample. The sample mean first-semester GPA was 3.26 (SD = 0.84) and the first-year GPA was 3.26 (SD = 0.78).

Number of DFW and Remedial Courses. The number of courses that a student received a D, F, or W (withdraw) or took a remedial course in their first semester or year of higher education. Although the average number of DFW or remedial coursework was small, with first-year DFW and remedial course sample means of 0.65 and 0.04 courses respectively, the percentage of students with at least one is larger. The mean percentage of students who had at least one DFW course during their first semester was 17% (SD = 38%) and 26% (SD = 44%) for the first year. Remedial coursework is a lower percentage; about 2% and 3% of students took at least one remedial course during the first semester and first year respectively.

Analyses

The study analyzes differences in collegiate outcomes based on assignment into academic advising groups based on SAT or HSGPA. To create the groups, we approached the research question by using percentiles of local higher education institutional data. For each institution, we calculated the 5th, 10th, and 15th percentiles for SAT Total scores and

HSGPA. This is to simulate the use of these measures to identify weaker students likely to benefit from additional academic support in a straightforward manner. The 5th percentile threshold aligns with the advisor caseload recommendation by EAB (2024) for students who need more support. Then, within each institution, four groups are identified:

- Below Both: A student is below the percentile groups for both SAT Total score and HSGPA.
- Below HSGPA Only: A student is below the percentile for HSGPA, but not SAT Total score.
- Below SAT Only: A student is below the percentile for SAT Total score, but not for HSGPA.
- Above Both: A student is above both SAT Total score and HSGPA percentile groups.

Inferential Analyses

Inferential analyses using linear mixed models tested whether the associations between student and institutional characteristics and the outcomes differed across the four groups above, using a random intercept to account for the nesting of students within institutions. These analyses are intended to be supplemental and to validate the descriptive analyses noted above. Key outcomes explored were collegiate first-semester and first-year GPA, whether a course grade of D, F, or W was present in the first year, and whether a student was retained to the second year of college.

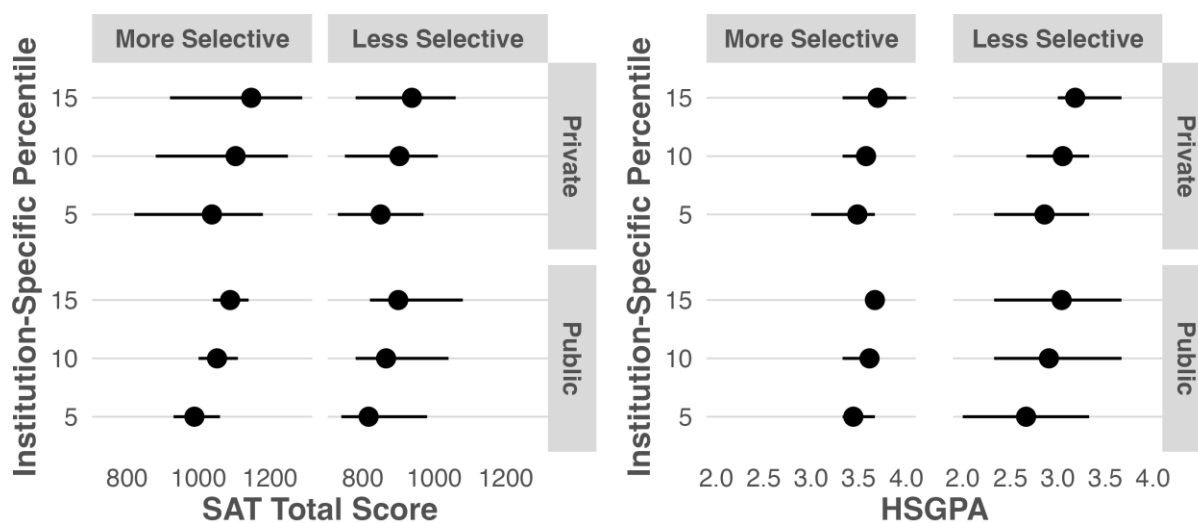
To estimate the total effect of each admission threshold flag for each student and institutional subgroup, we computed estimated marginal means and pairwise contrasts from each model. For the linear mixed models (LMMs) predicting GPA outcomes, we estimated the predicted GPA difference between the four groups separately for each subgroup, with equal weight across levels of the other moderators. For the generalized linear mixed models (GLMMs) predicting DFW rate and retention, estimated marginal means were first back-transformed to the probability scale and contrasts were computed as risk differences. Estimates represent the difference in predicted probability of each outcome between the groups compared to the Above Both group.

Results

Each institution had an SAT Total score value associated with students in the 5th, 10th, and 15th percentile at that institution¹. When grouped by institutional control and admissions selectivity, there is a range of SAT Total scores that each percentile takes on. *Figure 1* shows the average institutional percentiles with minimum and maximum by institution type and selectivity. The SAT Total score percentiles tend to be lower for public institutions compared to private institutions, but the more notable difference is due to selectivity. Less selective institutions have much lower SAT Total score percentiles compared to more selective institutions. The differences across the two selectivity groups are more than 100 SAT score points, sometimes with a 200-point difference.

Like SAT Total score, HSGPA percentiles can also range by institution control and selectivity. Similar trends are found, but there is much less variation in these percentile distributions. For more-selective institutions, there is a substantial restriction of range with high percentiles. For example, the 5th percentile for more-selective institutions is between a B or A- range of high school average grades.

Figure 1: Average Institutional Percentile (Dot) With Minimum and Maximum Institution Thresholds (Lines), by Institutional Characteristics.



¹ Institutional thresholds for the SAT were based on all students enrolled at a college, not just scores students reported to an institution.

Average Pre-College Performance Across Groups

Table 3 shows the average HSGPA and SAT Total scores for students in the four SAT and HSGPA identification groups and across the three percentile thresholds. Students who were below both HSGPA and SAT thresholds had the lowest mean HSGPA and SAT Total scores. Students who were above both thresholds had the highest mean HSGPA and SAT Total scores. Students who were below on one threshold, were close to the mean for those that were below both, but only for the metric they were identified with. For example, students who were below SAT Total score only, had mean SAT Total scores similar in magnitude to students who were below both, but their HSGPA was more similar to the above both group. The same trend was found for students identified by HSGPA only.

Table 3: Average HSGPA and SAT Total Scores by the Three Thresholds and the Four Groups.

Thresholds	Below Groups	HSGPA		SAT Total score		n
		Mean	SD	Mean	SD	
5	Below Both	2.99	0.51	857	100	1,273
	Below HSGPA Only	3.11	0.49	1153	171	10,011
	Below SAT Only	3.75	0.40	854	101	3,736
	Above Both	3.88	0.36	1192	171	85,216
10	Below Both	3.11	0.47	893	107	3,619
	Below HSGPA Only	3.21	0.44	1164	162	15,952
	Below SAT Only	3.86	0.33	906	112	6,466
	Above Both	3.94	0.31	1210	164	74,199
15	Below Both	3.21	0.46	926	115	6,313
	Below HSGPA Only	3.31	0.44	1188	156	19,636
	Below SAT Only	3.90	0.31	937	118	8,819
	Above Both	3.97	0.29	1222	160	65,468

Descriptive Statistics

College Grades

Figure 2 shows the first-semester and first-year college GPA by the four primary groups and the different percentile thresholds. Overall, first-semester and first-year GPA was lowest for students who were identified by both SAT Total score and HSGPA thresholds, ranging from GPAs between 2.5 and 2.7 which is between a C+ and B- average grades. Those who were identified as being below on the SAT Total score only had the next lowest average college GPAs, ranging from about 2.7 to 2.95 or about a B- to B average, followed by those below HSGPA only, ranging from about 2.9 to 3.0 or about a B average. The students who were above both thresholds had much higher average college GPAs, between 3.3 and 3.4, which is a B+ average. The largest differences between the four groups were for the fifth

percentile threshold, almost a full letter grade difference, but differences were still large for the fifteenth percentile threshold as well.

Figure 2: College GPA by Different SAT Total Score and HSGPA Percentiles.

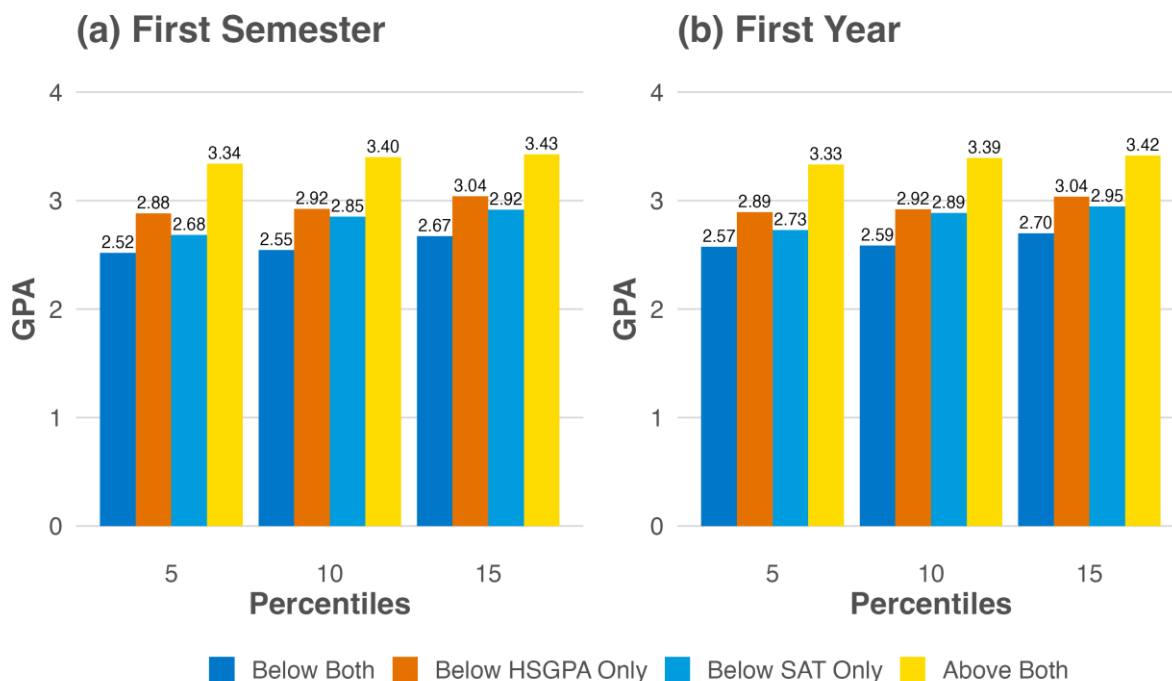
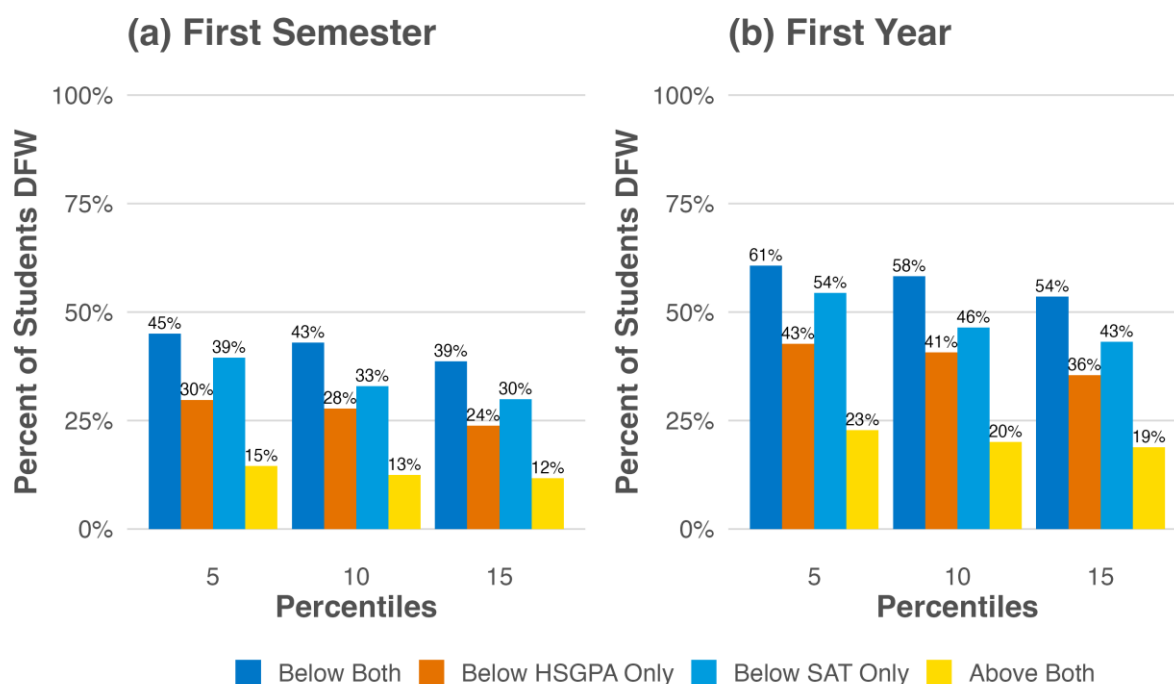


Figure 3 shows the percentage of students with at least one D, F, or W in the first semester or first year of college. Students who were below both SAT and HSGPA thresholds had the highest rates of at least one D, F, or W in their first semester or first year, ranging from 39% to 45% for the first semester and between 54% and 61% for the first year. Those below the SAT Total score threshold only had the next highest rates, ranging between 30% and 39% for the first semester and 43% to 54% for the first year. Those identified as below on only HSGPA have smaller rates of at least one D, F, or W compared to the SAT only group, with rates ranging from 24% to 30% for the first semester and between 36% and 43% for the first year. Finally, those who were above both thresholds had the lowest rates of at least one D, F, or W during their first semester or first year, less than 15% in the first semester and less than 23% in their first year. Overall, rates were higher for lower percentiles and first-year rates were naturally larger with more time to accumulate at least one D, F, or W. The differences between first semester and first year were larger for students who were below both thresholds or below the SAT Total score only thresholds.

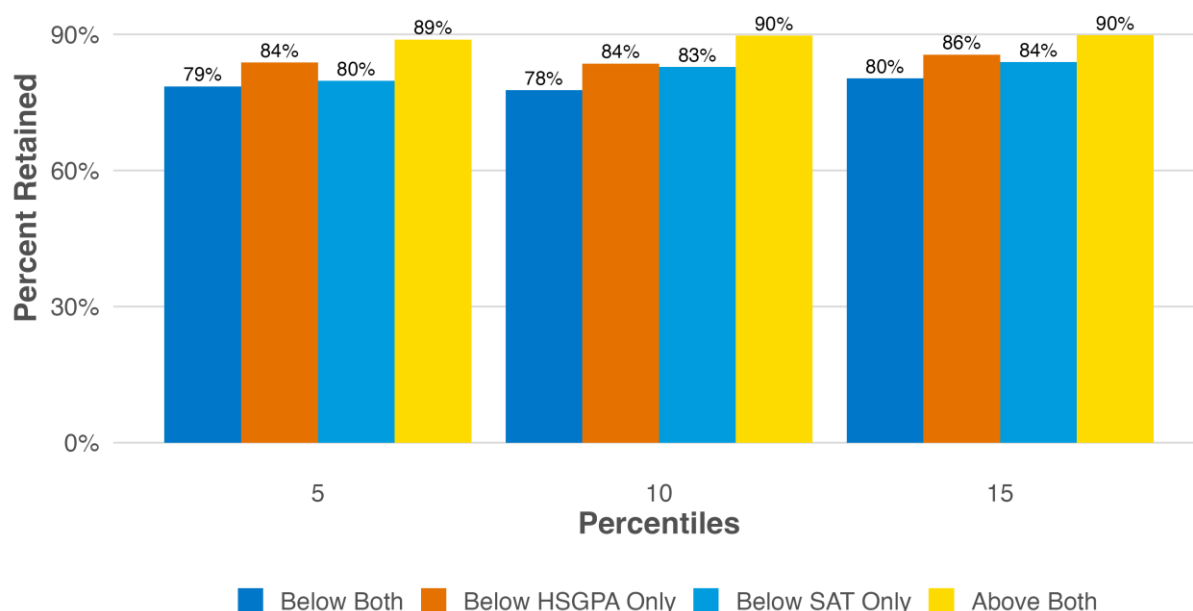
Figure 3: Percent of D, F, or W Grades by Different HSGPA Percentiles and SAT Total Score Percentiles.



Retention

Figure 4 shows the average retention rates for those across the percentile thresholds studied. Retention rates were highest for those above both thresholds, with about 90% retained. Retention was lower for students who were identified by one or more of the thresholds. Students who were below both the SAT Total score and HSGPA thresholds had the lowest retention rates, 80% or smaller. Retention rates were similar for those who were identified by one of the SAT Total score or HSGPA thresholds, about 85% for the tenth and fifteenth percentile thresholds. A small difference was found for the fifth percentile, 80% for students only below the SAT Total score threshold compared to 84% for students only below the HSGPA threshold.

Figure 4: Retention Rates by Different HSGPA Percentiles and SAT Total Scores Percentiles.



Institution Characteristics

College Grades

We also explored results by institutional admission selectivity and control (public/private). We define more selective institutions as those who admit less than 50% of applicants. First-semester college GPA is shown in [Figure 5](#). Students who fall below both SAT Total score and HSGPA percentiles have lower first-semester GPAs. In almost all conditions, the first-semester GPA is below 3.00 (B letter grade average). For public less-selective institutions, the average first-semester GPA can be as low as 2.26 (C+ letter grade average). Students who were above both thresholds had approximately a full letter grade average higher than those that were below on both. For example, in less-selective public institutions, the average first-semester GPA was about 3.2 to 3.3 (B+ letter grade average). Results were similar for first-year GPA and are not shown visually.

Figure 5: First-semester Collegiate GPA by Different HSGPA Percentiles, SAT Total Score Percentiles, Institutional Selectivity, and Public or Private Institution.

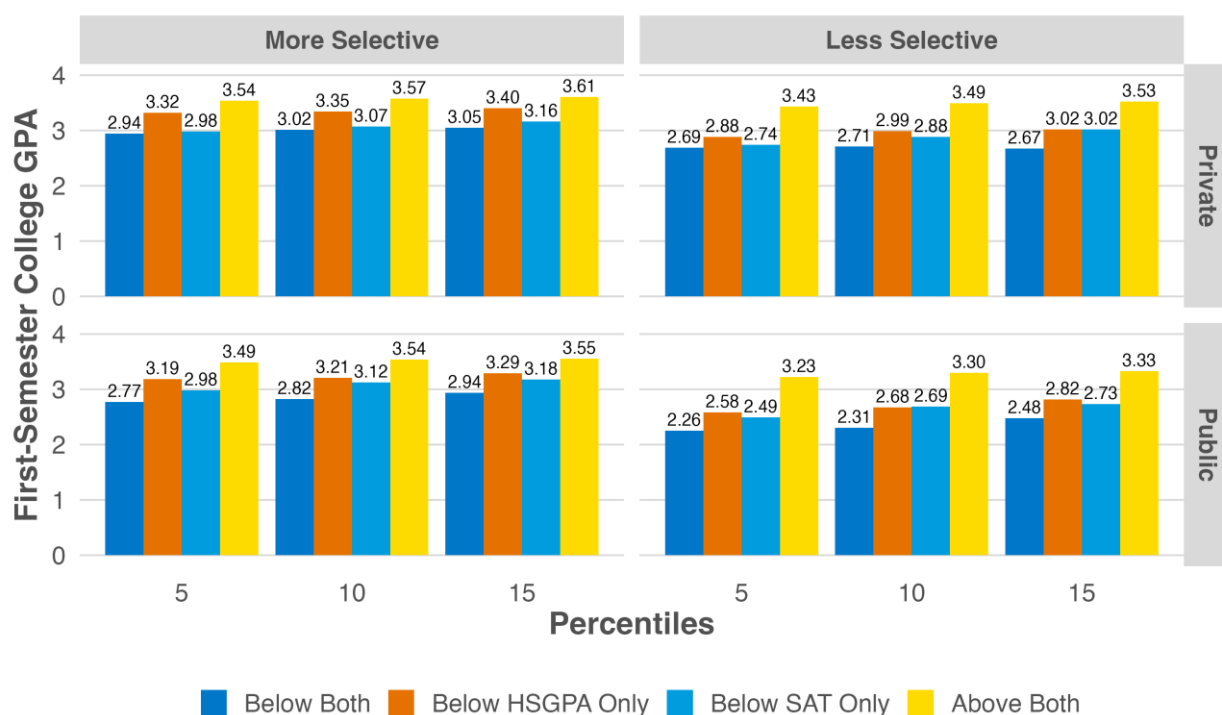


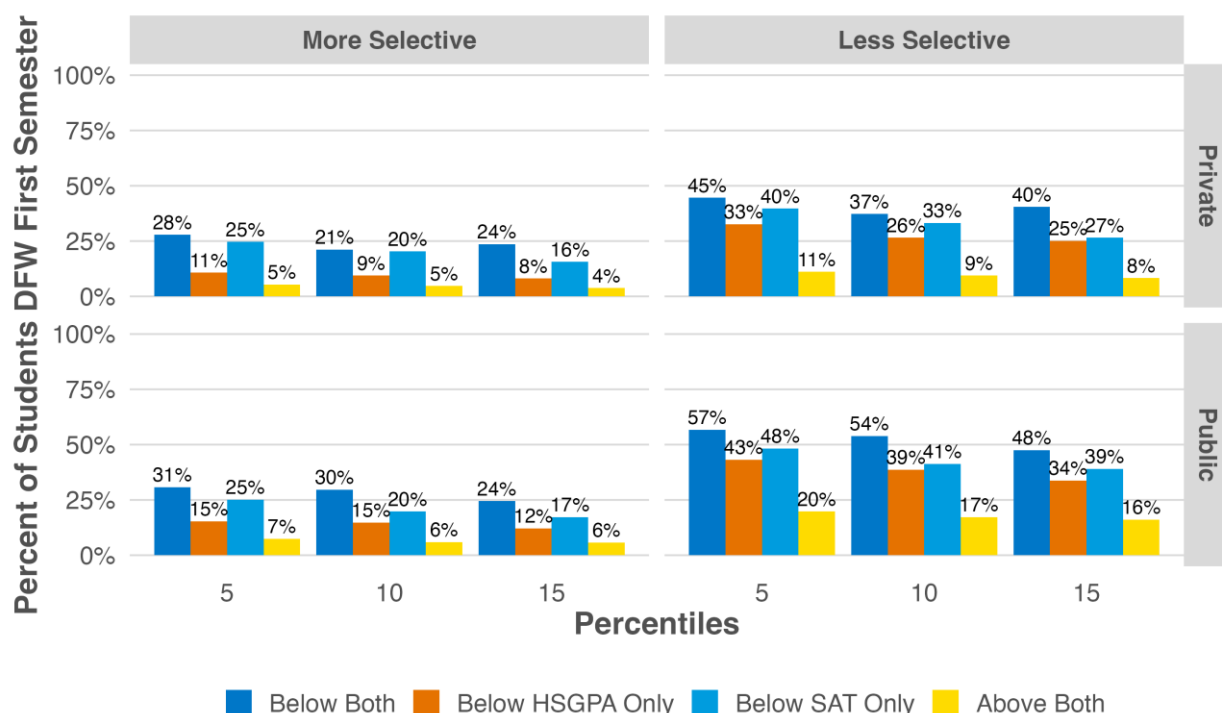
Figure 6 shows the percentage of students who had at least one D, F, or W in their first semester of college. Percentages of D, F, or W were lower for more selective institutions (left panel) compared to less selective institutions. Students who fell below both the SAT and HSGPA thresholds were more likely to have at least one D, F, or W, with percentages between 20% and 30% for more selective institutions and between 40% and 60% for less-selective institutions.

When using only the HSGPA thresholds, the percentage of students with a D, F, or W was much lower than for students below both thresholds, especially at more-selective institutions. At more-selective institutions, the gap between students below both thresholds and students below only the HSGPA threshold was between 12% and 17%. In contrast, the gap between students below both thresholds and students below only the SAT threshold was between 1% and 10%. This indicates that SAT scores and HSGPA capture partially distinct information, so using them together flags students who would be missed by either measure alone. At more-selective institutions in particular, SAT Total scores add identifying information for students whose higher HSGPA would otherwise leave them unidentified.

At less selective institutions, students below both thresholds had higher percentages of at least one D, F, or W than their counterparts at more-selective institutions. The gaps between single-threshold and both-threshold identification were smaller here, and the difference between students below only the HSGPA threshold and those below only the SAT threshold was also smaller. This means the two measures capture a similar set of students. However, because baseline DFW rates are so high (approximately 50% or greater at public less-selective institutions), broad identification still has practical value regardless of which measure triggers it.

Overall, students who met both the SAT and HSGPA thresholds had much lower rates of at least one D, F, or W in the first term. These rates were about 5% at more selective institutions, about 10% at private less selective institutions, and between 15% and 20% at public less selective institutions. Although not shown graphically, first-year DFW rates follow the same patterns at elevated levels (about 15% to 20% higher at public institutions). Because the same students are tracked across both periods, this elevation reflects additional D, F, or W grades accumulated by initially flagged students rather than a change in which students are at risk. First-semester rates are therefore reported as the primary intervention-relevant metric.

Figure 6: Percent of first-semester D, F, or W grades by Different HSGPA Percentiles, SAT Total Score Percentiles, Institutional Selectivity, and Public or Private Institution.

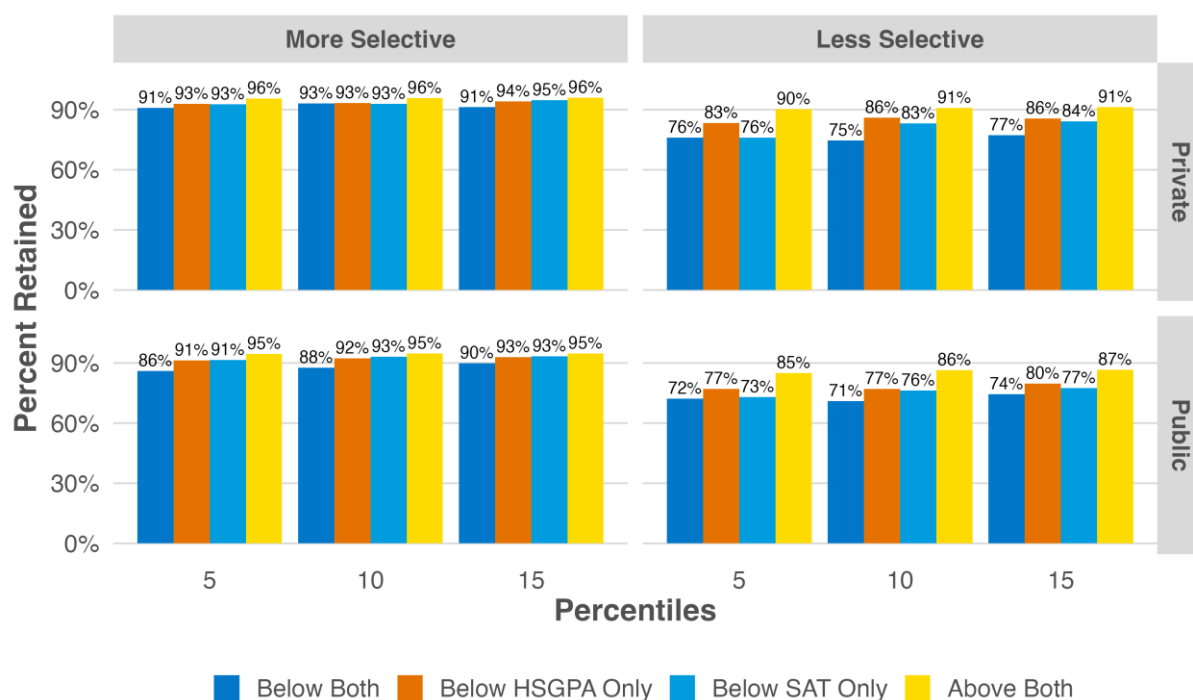


Retention Rates

Figure 7 depicts retention rates (year one to year two) by institution subgroups. When exploring retention rates for more selective institutions (left column), there were small differences for those that were below the threshold on both indicators compared to those that met both, about 5% across the different thresholds and institution types. Patterns for persistence (not shown visually), continuing enrollment to any institution in the second year, were similar to retention, but rates were higher.

Larger differences were found for less selective institutions (right column). For example, at the fifth percentile, retention rates were 76% and 72% for those that were below both indicators at private and public institutions respectively. Finally, there is evidence that students below SAT Total score only are at greater risk of not being retained at the same institution between years one and two, especially for the 5th percentile thresholds. For example, retention rates were similar between students below both and below SAT only, but those identified by HSGPA only were higher. The differences between those below SAT only and below HSGPA only were much smaller for the 10th and 15th percentile thresholds.

Figure 7: Rates of Retention by Different HSGPA Percentiles, SAT Total Scores Percentiles, Institutional Selectivity, and Public or Private Institution.



Inferential Results

Inferential results confirmed the primary findings from the descriptive analyses above. The SAT Total score and HSGPA thresholds were important predictors even after adjusting for institutional differences using the statistical modeling approach. Using the 10th percentile threshold, students below both thresholds had the weakest outcomes across all measures (first-semester GPA = 2.49, first-year GPA = 2.52, probability DFW = 62%, probability retained = 76%) compared to those that were above both thresholds (first-semester GPA = 3.35, first-year GPA = 3.33, probability DFW = 19%, probability retained = 90%); institutions were modeled as random effects. Students below a single threshold fell between these extremes, with small and largely overlapping differences between the SAT only group (first-semester GPA = 2.80, first-year GPA = 2.82, probability DFW = 49%, probability retained = 82%) and the HSGPA only group (first-semester GPA = 2.86, first-year GPA = 2.85, probability DFW = 43%, probability retained = 83%). The ordering held across student and institutional moderators, though differences were most pronounced for college GPA and DFW rate and more muted for retention (see Figures A1 through A3). Results were similar across the other percentile thresholds and are therefore not displayed.

Discussion

This study explored how SAT scores and HSGPA could be simply and efficiently used to help identify students who may need targeted academic support as they begin college. These key academic indicators serve as important pre-enrollment indicators which can align to needs for support and assist with managing advisor caseload and avoiding overload (EAB, 2024). Study results showed that using institution-specific SAT and HSGPA percentiles were strong signals of differential collegiate outcomes. Notably, students identified as being below the institution-specific SAT Total score and HSGPA percentiles studied had lower college outcomes, including first-semester and first-year college GPA, were more likely to have at least one D, F, or W course grade, and were less likely to retain to the second year of college. Students who were below both the SAT and HSGPA percentile thresholds had the poorest collegiate outcomes. For example, they were more than three times as likely as students above both thresholds to earn at least one first-semester D, F, or W, and their retention rate was about 10 points lower. Targeting students who fall below both metrics offers institutions a useful starting point for additional support. The next most sensitive identification threshold was the SAT. In other words, while many test optional institutions may only have access to HSGPA as a key pre-college academic measure, this study showed that having access to both SAT and HSGPA, or the SAT on its own, would better serve an institution in most accurately identifying students with weaker college outcomes who would benefit from early academic support.

Institutional attributes, including control and admission selectivity, also showed differential effects. Across both the 5th- and 10th-percentile identifying thresholds, students from less-selective public institutions who fell below the cutoff on both SAT and HSGPA had DFW rates above 50% and retention rates just above 70%. The SAT score thresholds were better than HSGPA thresholds at showing students who may benefit from additional support at more selective institutions and at private institutions, likely due to a restriction of range in HSGPA for enrolled students. At more-selective institutions in particular, SAT Total scores add critical identifying information for students whose higher HSGPA would otherwise leave them unidentified as likely to benefit from additional support.

Conclusion

This study shows that the SAT can be a highly useful tool to assist institutions in efficiently identifying those students who may benefit most from academic support as they arrive on campus. Results showed that institution-specific SAT, as well as SAT and HSGPA total score thresholds, can be used as strong indicators of students who may benefit from additional support. The results were similar across the three percentiles studied (5, 10,

and 15%) and which percentile an institution may want to use depends on how many students they are interested in providing additional support to. For example, if the institution is large or the number of academic advisors is limited, using the institution's fifth percentile would identify the students who may need the most support while keeping advisor load at a sustainable level (EAB, 2024). Having access to both SAT scores and HSGPA provides the most accurate understanding of which students will have the weakest outcomes, followed by using SAT scores alone, then by HSGPA. Therefore, test-optional admission policy institutions may want to consider utilizing test scores post-enrollment, for academic advising purposes that will most promote student success and most efficiently utilize campus resources.

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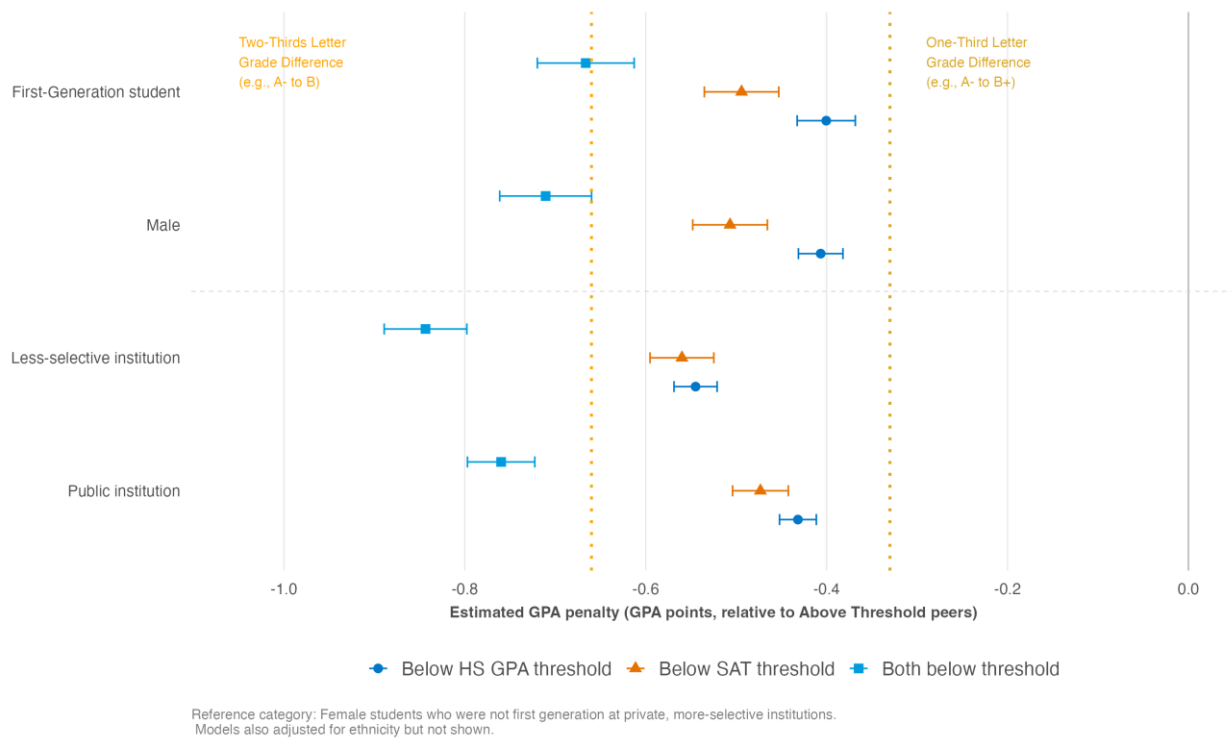
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Appendices

Collegiate Grade Outcomes

Figure A1: Estimated Marginal Means for Student Level and Institutional Level Attributes for First-Semester GPA.



The analyses include two-way interactions between the four SAT and HSGPA groups and each moderator (first-generation college-going status, gender, institutional admission selectivity, institutional control). Results are presented as GPA differences relative to the highest-performing group (students who scored Above Both). Negative values mean those groups earned lower GPAs than the top group. The vertical reference lines help readers gauge practical significance, marking gaps equal to one-third and two-thirds of a letter grade. Error bars represent 95% confidence intervals. [Figures A2](#) and [A3](#) follow the same logic, except they show differences in other outcomes studied. All analyses show the 10% threshold, but similar results were found for the 5% and 15% thresholds.

Figure A2: Estimated Marginal Means for Student-Level and Institutional-Level Attributes for the Likelihood of Having at Least One D, F, or W.

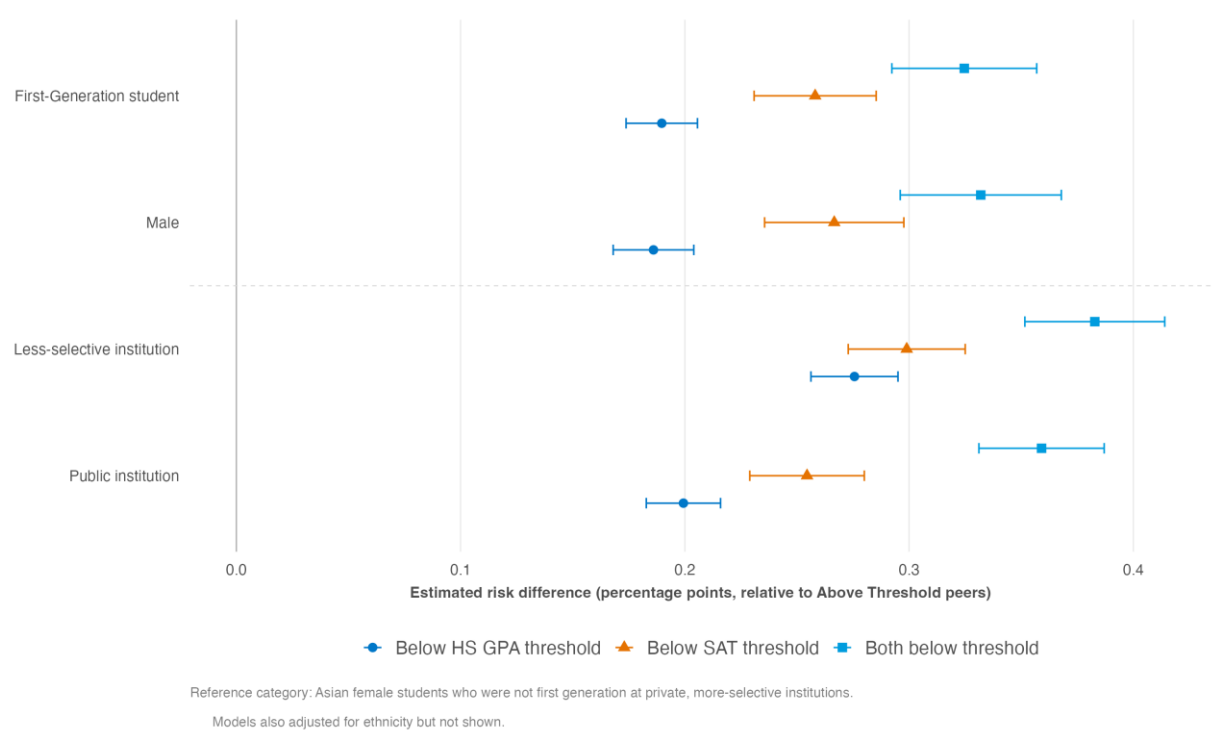


Figure A3: Estimated Marginal Means for Student-Level and Institutional-Level Attributes for the Likelihood of Students Retaining to the Second Year.

