CollegeBoard

SEPTEMBER 2023

Digital SAT® Pilot Predictive Validity Study – A Comprehensive Analysis of First-Year College Outcomes

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Table of Contents

Abstract

This pilot study examines digital SAT® score relationships with first-year college performance. Results show that digital SAT scores predict college performance as well as paper and pencil SAT scores, and that digital SAT scores meaningfully improve our understanding of a student's readiness for college above high school grade point average (HSGPA) alone. In this study, there was a 22% improvement in the prediction of college performance when the SAT and HSGPA were used together, instead of using the HSGPA alone. For STEM majors, the added SAT value was 38%. Similar results were found when the outcome examined was course credits earned in the first year, a metric for understanding student progress toward degree completion. Findings from this study show that the SAT remains a powerful tool for understanding students' readiness for college, for course placement and academic major field decisions, scholarship and honors program decisions, and identifying students who may need academic support.

Introduction

In March 2023, College Board launched the digital SAT internationally and will make it available to students in the U.S. in March 2024. The digital SAT measures the skills and knowledge that students are learning in school and that matter most for college and career readiness, just as the current paper and pencil SAT does, but the digital delivery format takes less time to complete while allowing for more time, on average, to answer each question. The digital SAT continues to be scored on the same score scale, 400 to 1600, as the paper and pencil test it is replacing (College Board, 2022).

In accordance with *The Standards for Educational and Psychological Testing* (2014), modifications of an exam necessitate an analysis of how the new scores relate to the outcomes they are intended to predict. For the digital SAT, this includes the prediction of college academic performance – to inform our understanding of the utility of digital SAT scores in college admission, placement, scholarship, and advising decisions and processes on campus.

College Board recently analyzed the relationship between digital SAT scores and first semester grade point average (GPA) at 12 four-year institutions (Marini, Westrick, Young, Ng, & Shaw, 2023). The current study is an extension of this work as we examine the predictive relationships between digital SAT scores and first-year college GPA (FYGPA), spanning the full academic year of coursework at these same institutions.

Methodology

Study Design

Our aim was to recruit 10 to 15 diverse four-year institutions so that students (75-250 students per campus) could then be recruited to participate in an administration of the digital SAT very early in their first year of college. College Board offered students $150 gift cards for participating in the exam, and an additional $50 if they met or exceeded their PSAT/NMSQT® or SAT scores on record at College Board, to promote motivated performance on the exam. Student participants also agreed to have their institutions share their first-year college performance information with College Board.

Institutional Sample

The desired sample of institutional participants was intended to reflect the population of four-year higher education institutions as well as possible while also facilitating a successful study (e.g., larger institutions would be more likely to recruit enough student participants). Ultimately, we recruited 12 four-year institutions for the initial study. Institutional participants were more likely to be public and very large institutions. The institutions in the study varied by admittance rate and geographic area of the U.S. and included one historically black college and university (HBCU) and two Hispanic Serving Institutions (HSIs). However, for the current study, one institution did not provide sufficient coursework data to be included in the study sample. The characteristics of the 11 institutions included in the analyses are summarized in Table 1 below.[1]

[1] See Appendix Table A1 for more information on the institutional population.

Table 1: Institutional Characteristics of the Study Sample

Institutional Characteristic		**Total Sample (k=11)**
U.S. Region	Midwest	9%
	Mid-Atlantic	9%
	New England	18%
	South	27%
	Southwest	18%
	West	18%
Control	Public	64%
	Private	36%
Admittance Rate	Under 25%	27%
	25% to 50%	9%
	51% to 75%	55%
	Over 75%	9%
Undergraduate Enrollment	Small (n<5,000)	0%
	Medium (5,000<n<9,999)	0%
	Large (10,000<n<19,999)	9%
	Very Large (n≥20,000)	91%

Note. Percentages may not sum to 100 due to rounding.

Student Sample

A total of 1,990 first-year, first-time college students participated in the digital SAT pilot exam administrations across the original 12 institutions in the study. All students had graduated from high school in spring 2022 and had a prior SAT score or PSAT/NMSQT score on record at College Board. Our study inclusion criteria required that students have a self-reported HSGPA and a FYGPA, and we excluded students who had a 200-point or more section score decrease from the paper and pencil SAT to the digital SAT (indicating questionable motivation), resulting in a final sample of 1,889 students. Demographic information regarding the study sample is presented in Table 2. The sample included more female than male students, and included about one-third underrepresented minority students, one-third Asian students, and one-third white students. Slightly more than one-fourth of the sample reported that English and Another or Another language was their best language, and most students had parents with a bachelor's or graduate degree.[2] See Appendix Table A2 for demographic information for the high school class of 2022 who took the SAT and the most recent National SAT Validity Study sample that, like this study sample, includes only enrolled college students (from the entering class of fall 2020).

[2] As a check, we reweighted the sample to more closely resemble typical SAT validity study populations in terms of institutional and student characteristics. We found that correlations were all within the 95% confidence intervals of the sample correlations calculated and therefore analyses were conducted on the original sample.

Table 2: Student Characteristics of the Current Study Sample

Student Characteristic		Total Sample (n=1,889)
Gender	Male	42%
	Female	58%
	Another/Omitted	<1%
Ethnicity	American Indian/Alaska Native	<1%
	Asian	33%
	Black/African American	6%
	Hispanic/Latino	21%
	Native Hawaiian/Other Pacific Islander	<1%
	White	33%
	Two or More Races	4%
	No Response	3%
Best Language	English Only	74%
	English and Another	24%
	Another	2%
	No Response	<1%
Highest Parental Education Level	No High School	4%
	High School Diploma	14%
	Associate Degree	4%
	Bachelor's Degree	35%
	Graduate Degree	39%
	No Response	3%

Note. Percentages may not sum to 100 due to rounding.

Measures

Paper and Pencil SAT scores. Official paper and pencil SAT scores were obtained from College Board's database and matched to each student that participated in the special administrations of the digital SAT. The paper and pencil SAT scores included in this study are:

SAT Total Score (400 to 1600 scale)—increments of 10, sample mean of 1332 (SD=158).

SAT Evidence-Based Reading and Writing (ERW) Section Score (200 to 800 scale)—increments of 10, sample mean of 662 (SD=76).

SAT Math Section Score (200 to 800 scale)—increments of 10, sample mean of 669 (SD=94).

Digital SAT Scores. Special administrations of the digital SAT took place at the 12 participating college campuses over four weekends in September and October 2022. The Digital SAT scores included in this study are:

SAT Total Score (400 to 1600 scale)—increments of 10, sample mean of 1297 (SD=163).

SAT Reading and Writing Section Score (200 to 800 scale)—increments of 10, sample mean of 643 (SD=85).

SAT Math Section Score (200 to 800 scale)—increments of 10, sample mean of 654 (SD=95).

High School GPA (HSGPA). Students' self-reported HSGPA was obtained from the SAT Questionnaire when they registered for the SAT (or PSAT/NMSQT) and is reported on a 12-point scale, ranging from 0.00 (F) to 4.33 (A+). The HSGPA measure in the current study had a sample mean of 3.97 (SD=0.34).

First-Year Credits Earned (FYCE). Course credits completed in all courses in the first year of college were obtained from the participating institutions. If a student failed a course, the credits earned equaled zero. The sample mean was 29 (SD=6). Note that most bachelor's degree programs require 120 college credits to graduate.

First-Year GPA (FYGPA). First-year GPA and grades in all courses in the first year of college were obtained from the participating institutions. FYGPAs were reported on a 0.00 to 4.00 scale. The sample mean FYGPA was 3.59 (SD=0.49).

Domain-specific GPAs. All college courses were coded for content area so that analyses could be conducted on domain-specific grade point averages. The three domain-specific college GPAs in the current study were math GPA (n=1,384, Mean=3.34, SD=0.85), STEM GPA (science, technology, engineering, and math; n=1,765, Mean=3.45, SD=0.68), and all-but-math GPA (n=1,889, Mean=3.61, SD=0.50) as a criterion for analyses with the Reading and Writing section (as most courses in college involve reading and writing).

Domain-specific grade point averages were calculated within student, across all relevant course grades received in a particular area during the first year of college (excluding remedial course work). For example, if a student took only one math course in the first year, then their average course grade in math is based on the grade earned in that one course. If a student took three math courses, the average course grade is based on the average of the three course grades earned (taking into account the grades earned in each course and the number of credits associated with each course).

Descriptive Statistics

Table 3 shows the descriptive statistics for the measures included in the study. For students that did not complete the second semester, their first-year GPAs were based on the courses they had completed in the first semester. As is typical in predictive validity research involving enrolled college students (e.g., Shaw, Marini, Beard, Shmueli, Young, & Ng, 2016; Westrick, Marini, Young, Ng, Shmueli, & Shaw, 2019), the sample in this study was academically quite strong.

Table 3: Descriptive Statistics

Variable	N	Mean	SD	Min	Max
HSGPA	1,889	3.97	0.34	1.67	4.33
First-Year Credits Earned	1,889	29	6	1	43
First-Year GPA	1,889	3.59	0.49	0.58	4.00
First-Year Other-than-Math GPA	1,889	3.61	0.50	0.38	4.00
First-Year STEM GPA	1,765	3.45	0.68	0.00	4.00
First-Year Math GPA	1,384	3.34	0.85	0.00	4.00
Paper and Pencil SAT ERW Section Score	1,889	662	76	400	800
Digital SAT Reading and Writing Section Score	1,889	643	85	330	800
Paper and Pencil SAT Math Section Score	1,889	669	94	360	800

Variable	N	Mean	SD	Min	Max
Digital SAT Math Section Score	1,889	654	95	330	800
Paper and Pencil SAT Total Score	1,889	1332	158	830	1600
Digital SAT Total Score	1,889	1297	163	680	1600

Analysis

Study analyses included correlational analysis to arrive at the incremental utility (Schmidt & Hunter, 1998) gained with the inclusion of SAT scores above HSGPA to predict college grades and course credits earned in the first year. Analyses were conducted at the institution level, and then the results were weighted by institution size (number of students), aggregated, and then averaged using the total number of students. As admission selectivity restricts the range of students enrolled at the institutions, we followed standard practices to statistically correct the raw correlations because they typically underestimate the true relationship between test scores and college outcomes (American Educational Research Association, American Psychological Association, and National Council on Measurement in Education, 2014).[3] We also followed the standard practice of reporting both the raw and adjusted correlations. In addition to correlations, we utilized graphical depictions of mean differences in FYGPA, domain-specific GPA, or course credits by SAT total score bands. For dichotomized outcomes—earning a FYGPA of 3.0 or higher and earning 30 or more credits in the first year—we conducted logistic regression analyses at the institution level before weighting and aggregating to arrive at average parameter estimates.

Results

Table 4 displays the intercorrelations between the predictors in the current study – SAT Reading and Writing section scores, SAT Math section scores, and HSGPA. Consistent with previous research (Kobrin, Patterson, Shaw, Mattern, & Barbuti, 2008; Shaw et al., 2016), the correlations between each of the SAT section scores and HSGPA are approximately .50, indicating a strong relationship but also indicating that the SAT and HSGPA are not identical constructs and therefore contain unique and complementary information about a student.

Table 4: Corrected (Raw) Correlation Matrix of Digital SAT Scores and HSGPA

	SAT Reading and Writing	SAT Math
SAT Reading and Writing		
SAT Math	.81 (.63)	
HSGPA	.49 (.25)	.50 (.26)

Note. The correlation between Digital SAT Total score and HSGPA was .52 (.28).

[3] Without information on how students who were not admitted or those who did not enroll would have performed at an institution, there is only a small glimpse into how the tests work for selection. This restricts the variability or range in test scores available for analysis since the test scores available tend to be the higher scores of students who were admitted, minimizing the test score–criterion relationship. Correlations in this study were corrected for multivariate range restriction (Lawley, 1943) using the 2022 graduating seniors who took the SAT as the reference population.

First-Year GPA

Table 5 presents the correlations between the predictors—SAT scores and HSGPA—and FYGPA. Individually, the SAT and HSGPA had strong relationships with FYGPA, with correlations of .57 and .54, respectively, and jointly they had an even stronger relationship as indicated by a multiple correlation of .66, a 22% increase in predictive utility over using HSGPA alone.[4] For perspective, correlations with absolute values of .50 or higher are considered large (Cohen, 1988), indicating a strong relationship between SAT scores and FYGPA.

Table 5: Corrected (Raw) Correlation with Overall First-Year GPA (k=11, n=1,889)

Predictor(s)	Correlation	95% CI
SAT Reading and Writing	.53 (.32)	.50-.56
SAT Math	.55 (.35)	.52-.58
SAT Total	.57 (.39)	.54-.60
HSGPA	.54 (.27)	.51-.57
SAT+HSGPA	.66 (.46)	.63-.68
SAT incremental validity beyond HSGPA alone	.12 (.19)	

Note. Confidence intervals calculated using the adjusted correlations after rounding.

The positive relationships between SAT score and FYGPA presented in Table 5 can sometimes be better understood when presented visually. Figure 1 below demonstrates the relationship between digital SAT total scores and FYGPA. This graph depicts a clear and strong relationship between SAT scores and FYGPA; as digital SAT score bands increase, the mean FYGPA also increases. For example, students earning digital SAT total scores of less than 1000 have a mean FYGPA of 3.19 in this study, while students earning SAT scores between 1500-1600 had, on average, a FYGPA of 3.84.

[4] This value was calculated by subtracting the HSGPA-FYGPA correlation (.54) from the multiple correlation of HSGPA and SAT with FYGPA (.66) to arrive at the SAT incremental validity coefficient (.12). This coefficient is then divided by the HSGPA-FYGPA correlation (.54) and multiplied by 100 to arrive at the increment in predictive utility value of 22%. As there were differences between our sample and our typical national cohort, we performed checks by reweighting the sample to more closely resemble typical validity study populations in terms of student characteristics. We found that reweighted correlations were all within the 95% confidence intervals of the sample correlations presented in Table 5.

Figure 1: Mean First-Year GPA by Digital SAT Total Score Band

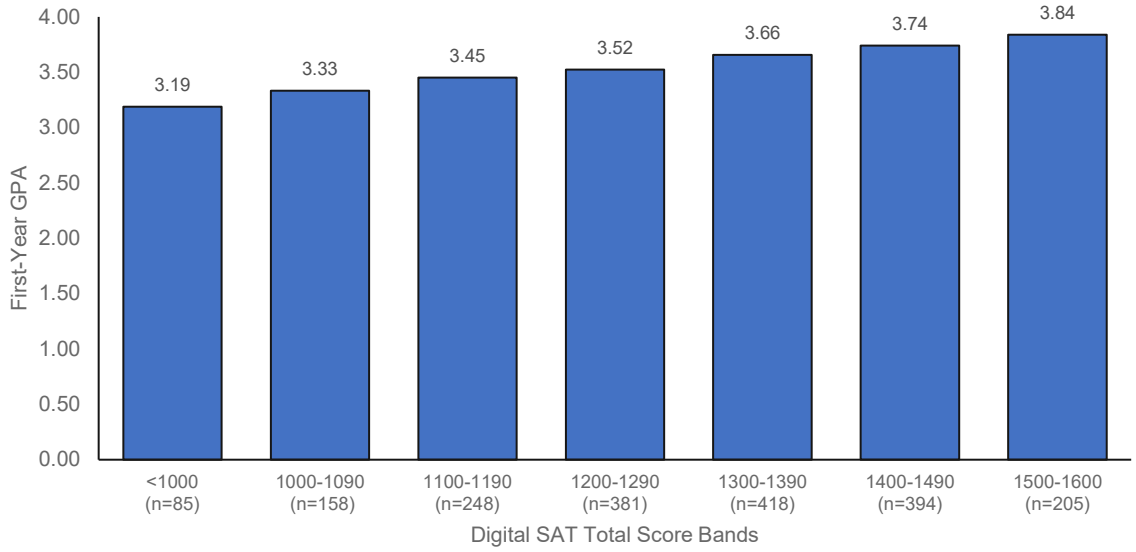
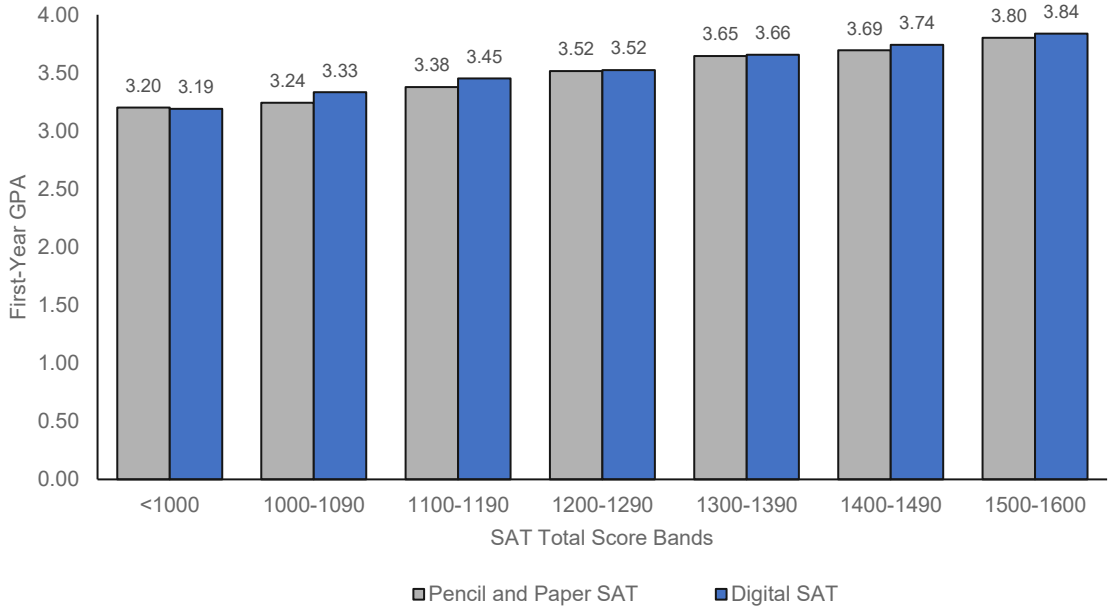


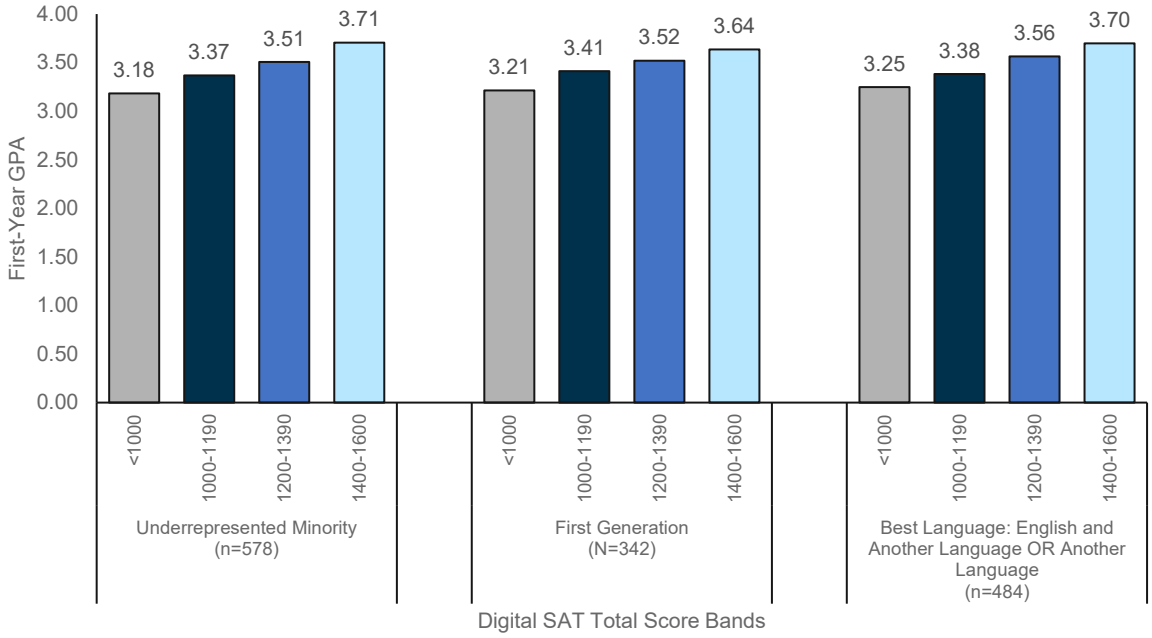
Figure 2 presents mean FYGPAs across both the paper and pencil and digital SAT total score bands. In stairstep fashion, students' mean FYGPA increased in tandem with their SAT scores on both the paper and pencil and the digital SAT. Moreover, this graph also highlights that the relationship between digital SAT scores and FYGPA is nearly identical to that of paper and pencil SAT scores with FYGPA for these students. **These results should assure current SAT score users of the value of digital SAT scores for understanding student readiness for college and for use in admission, course placement decisions, scholarship decisions, and identifying students needing academic support.**

Figure 2: Mean First-Year GPA by Paper and Pencil SAT and Digital SAT Total Score Band



To provide further validity evidence, we conducted subgroup analyses. Results for three key student subgroups of interest can be found in Figure 3 below—underrepresented minority students, first-generation students, and students whose best language was either another language or English and another language. As observed in the overall sample, as SAT score bands increase, so do students' mean FYGPAs. The results presented in Figure 3 provide evidence of the value of digital SAT scores in understanding the college performance of these student subgroups.

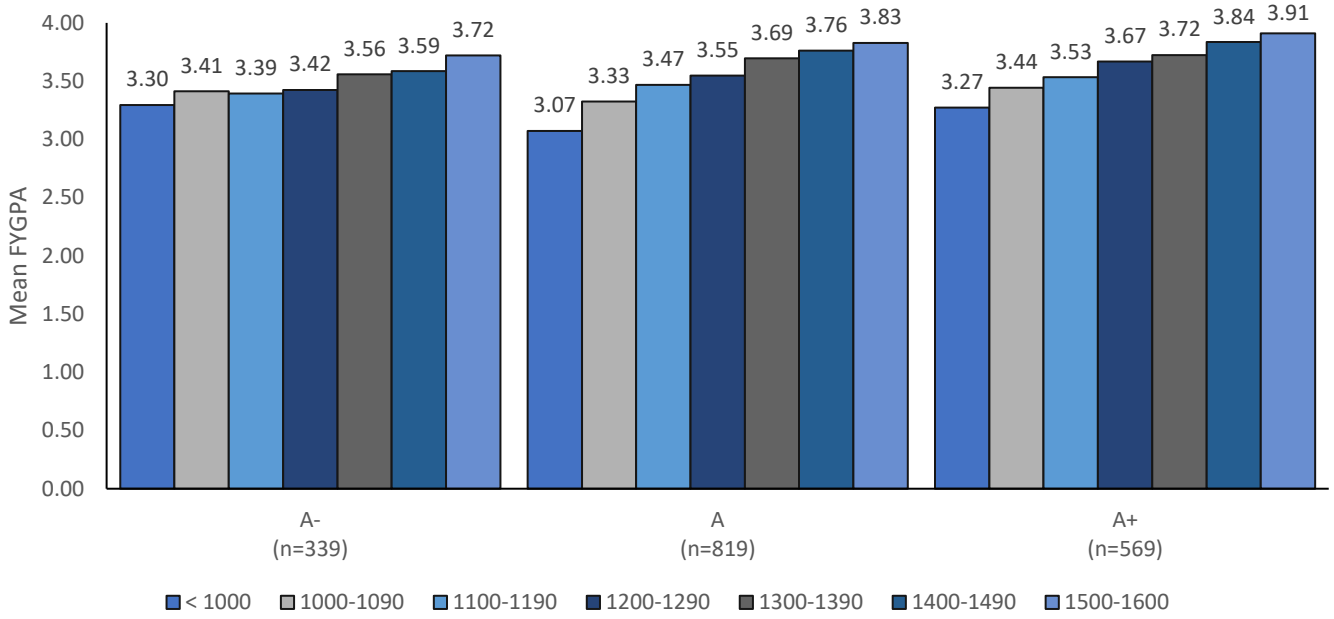
Figure 3: Mean First-Year GPA by Digital SAT Total Score Band: Subgroup Analyses



Controlling for HSGPA

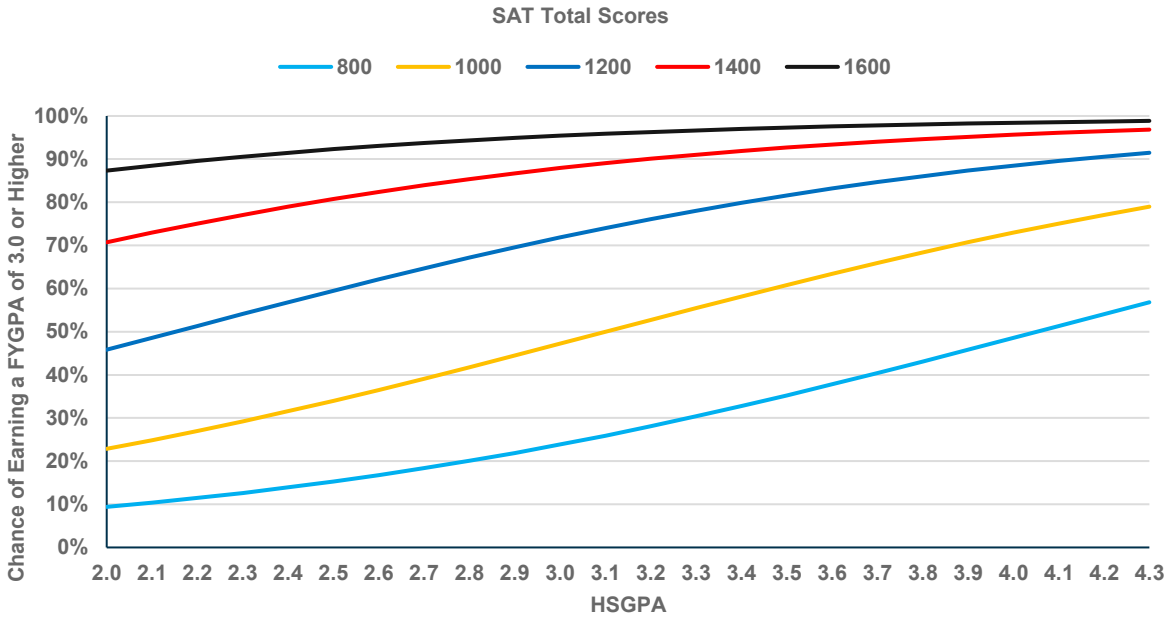
Next, Figure 4 allows us to see how digital SAT total scores differentiate students' academic performance among groups of students with the same HSGPA – essentially controlling for HSGPA to understand the added informational value of SAT scores. For example, for students with an A HSGPA, those with digital SAT scores between 1000 and 1090 had a mean FYGPA of 3.33, while those same A HSGPA students with an SAT score between 1400-1490 had a mean FYGPA of 3.76. Similar patterns are seen for students with HSGPAs of A- and A+. (As more than 91% of the sample reported a HSGPA of 3.67 or higher, we focused on these students.) Figure 4 also represents the 22% improvement in predictive utility of digital SAT scores above HSGPA alone to understand students' first year college performance, as discussed earlier for the correlations with FYGPA presented in Table 5.

Figure 4: Mean First-Year GPA by Digital SAT Total Score Band within HSGPA for "A" Students



Based on the full sample of 1,889 students, Figure 5 shows students' estimated probabilities, or chances, of earning a FYGPA of 3.0 or higher given their SAT total score and their HSGPA. As with the correlational analyses, the logistic regression analyses were conducted at the institution level. Institutional results were then weighted by the number of students, aggregated, and divided by the total number of students across institutions to obtain mean estimates. This figure demonstrates that students with the same HSGPA but different SAT scores have different estimated probabilities, or chances, of earning a FYGPA of 3.0 or higher. For example, students with an HSGPA of 4.0 and an SAT Total score of 1000 have a 73% chance of earning a FYGPA of 3.0 or higher, but students with the same HSGPA and an SAT Total score of 1400 have a 96% chance of earning a FYGPA of 3.0 or higher in this sample. If SAT scores didn't differentiate college performance among students with the same HSGPA (or add value beyond HSGPA information), the colored lines would all be stacked on top of each other, however, this is not the case.

Figure 5: Chance of Earning a First-Year GPA of 3.00 or Higher Given HSGPA and SAT Total Score



The joint use of SAT scores with HSGPA in a compensatory model like the one illustrated above helps institutions to predict a student's likelihood of succeeding in college despite having a low level of performance on either of the two predictors. Using HSGPA alone reduces an institution's ability to identify applicants who may perform well academically despite having low high school grades and applicants who may face academic difficulties despite superior high school grades. Being able to identify students who may struggle academically allows institutions to target these students early for academic support, which likely benefits both the student and the institution with regard to retention outcomes.

Domain-Specific FYGPAs

By SAT Section Scores

Figures 6 through 8 show the positive relationships between digital SAT section scores and domain-specific FYGPAs. Figures 6 and 7 show digital SAT Math section score relationships with first-year math GPA and first-year STEM GPA, respectively. Across the four Math section score bands—400 to 490, 500 to 590, 600 to 690, and 700 to 800—students' mean math and STEM GPAs increase in stairstep fashion, from 2.92 to 3.60 for first-year math GPA, and from 3.01 to 3.68 for first-year STEM GPA. Similarly, first-year all-but-math GPAs rose in tandem with digital SAT Reading and Writing section score bands, from 3.30 to 3.75. As a whole, these graphs reveal the helpful information that SAT section scores provide about first-year college performance in the related academic domain and show that SAT scores can be useful indicators of readiness for college level work in particular course areas, informing placement decisions.

Figure 6: Mean First-Year Math GPA by Digital SAT Math Section Score Band

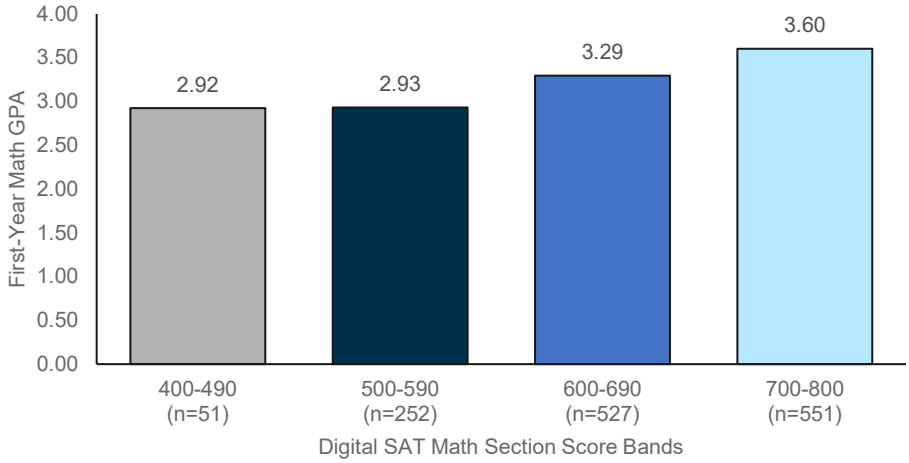


Figure 7: Mean First-Year STEM GPA by Digital SAT Math Section Score Band

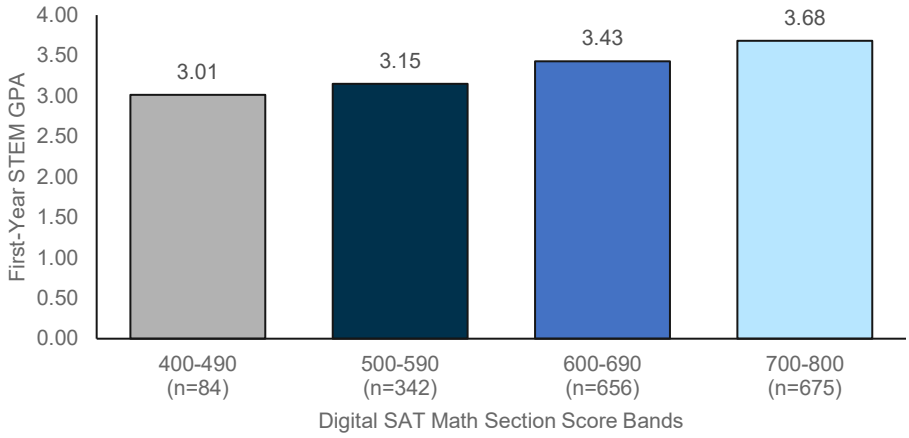
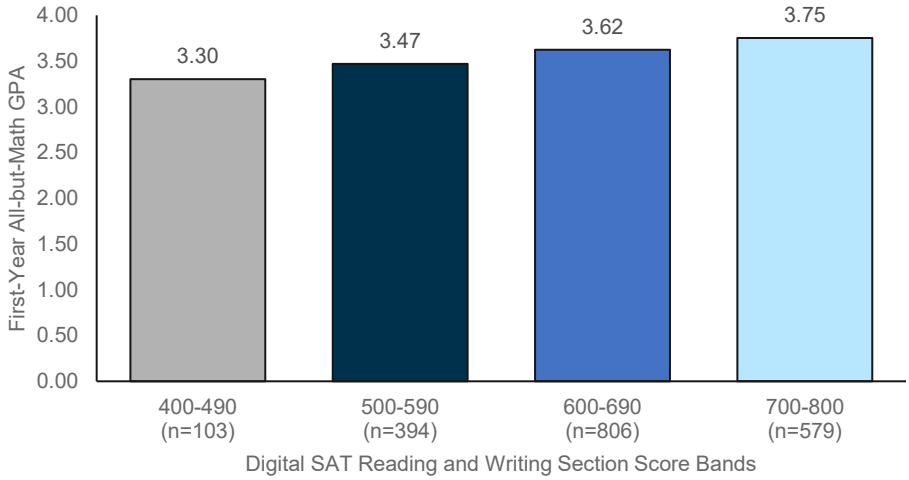


Figure 8: Mean First-Year All-but-Math GPA by Digital SAT Reading and Writing Section Score Band



Controlling for HSGPA

As we did for the FYGPA analyses, we conducted logistic regression analyses for the domain-specific GPAs at the institution level. Institutional results were then weighted by the number of students, aggregated, and divided by the total number of students across institutions to obtain mean estimates. Figures 9, 10, and 11 show students' estimated probabilities, or chances, of earning a domain-specific GPAs of 3.0 or higher given a student's corresponding SAT section score and HSGPA. At every point along the HSGPA scale, students with higher SAT section scores have higher chances of earning a GPA of 3.0 or higher within each of the three domains. For example, a student with an SAT Math score of 700 and a HSGPA of 4.0 has an 87% chance of earning a Math FYGPA of 3.0 or higher, but a student with the same HSGPA and an SAT Math score of 500 has a 49% chance of earning a Math FYGPA of 3.0 or higher. These graphs clearly show the information added by SAT scores, above HSGPA, to predict how students will perform in particular academic domains in college. Institutions may choose to run similar logistic regression analyses at their institutions to use SAT scores (and HSGPA) to inform course placement decisions.

Figure 9: Probability of a Math FYGPA 3.00 or Higher given SAT Math Score and HSGPA

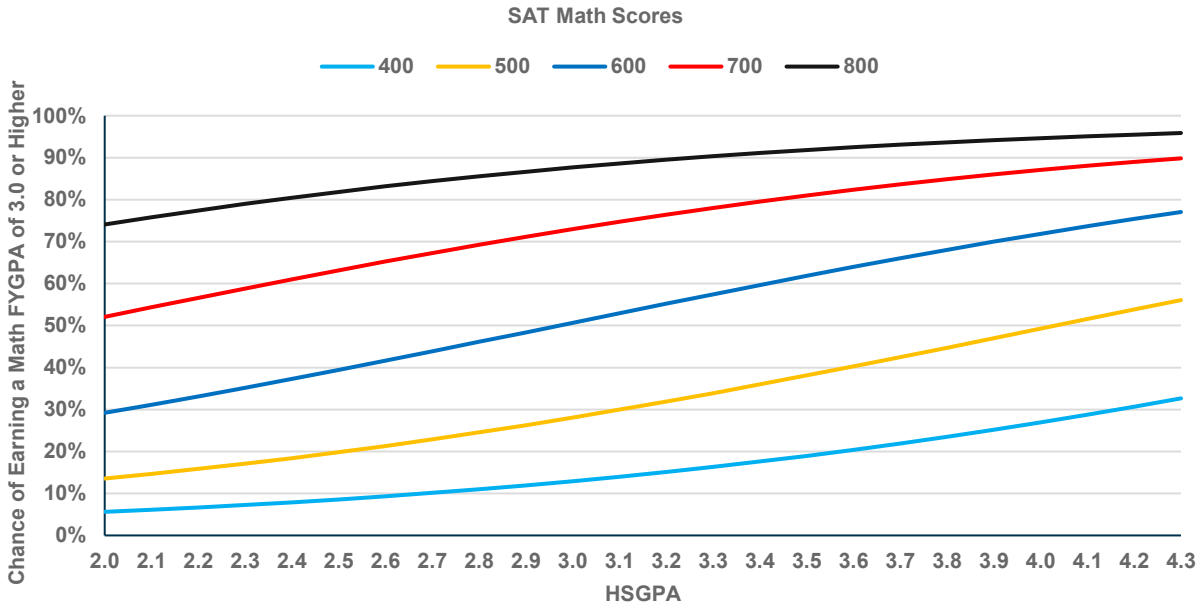


Figure 10: Probability of a STEM FYGPA 3.00 or Higher given SAT Math Score and HSGPA

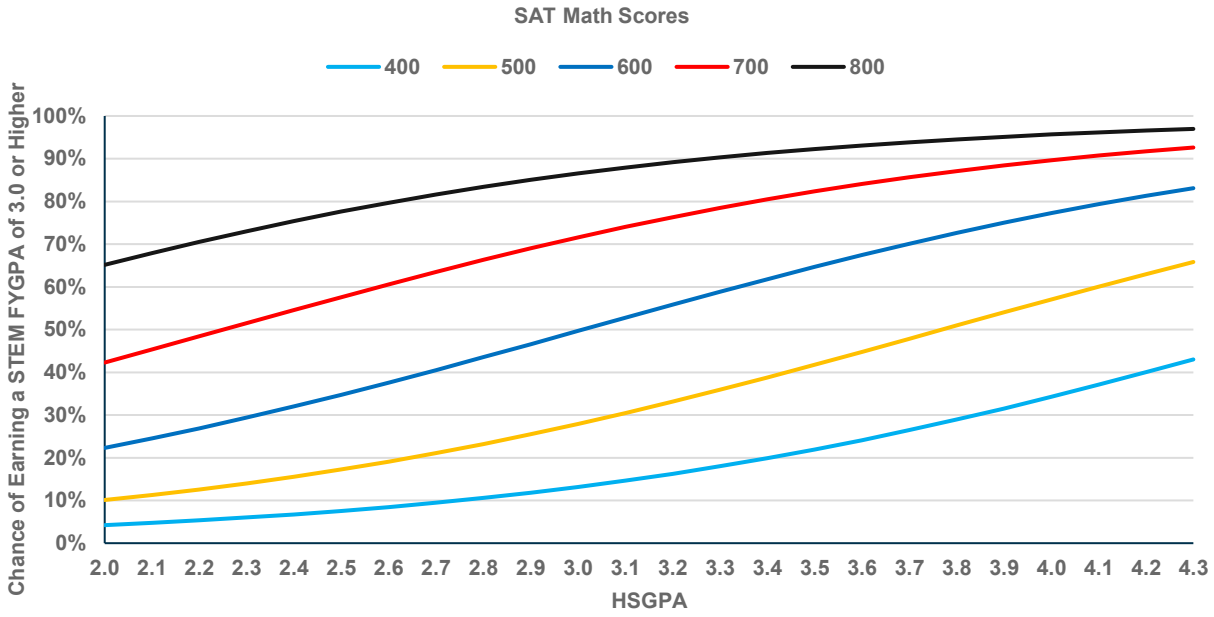
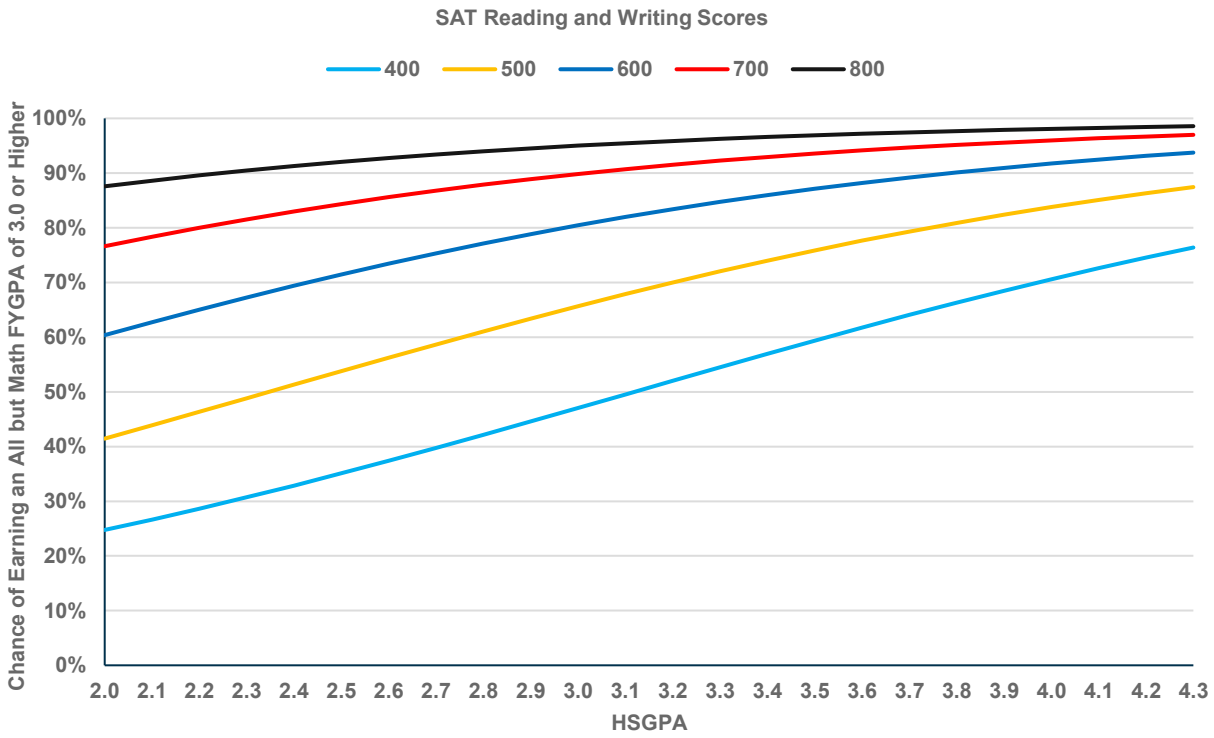


Figure 11: Probability of an All but Math FYGPA 3.00 or Higher given SAT Reading and Writing Score and HSGPA



STEM Majors

In addition to examining digital SAT score relationships with domain-specific GPAs, we examined SAT score relationships with FYGPA for students majoring in the STEM fields in their first year of college. We examined the added value of digital SAT scores above and beyond HSGPA to understand students' overall first-year academic performance. Figure 12 illustrates not only the strong, positive relationship between digital SAT scores and FYGPA for STEM majors, but also the SAT incremental utility in prediction of FYGPA above HSGPA. Among STEM majors, our analyses found correlations with FYGPA to be .64 for the SAT, .52 for HSGPA, and .72 for SAT scores used in conjunction with HSGPA, an improvement of 38% over using HSGPA alone.[5] This demonstrates the very large contribution of SAT score information to our understanding of how STEM majors will perform in the first year of college.

Figure 12: Mean First-Year GPA by Digital SAT Total Score Band within HSGPA, for STEM Majors

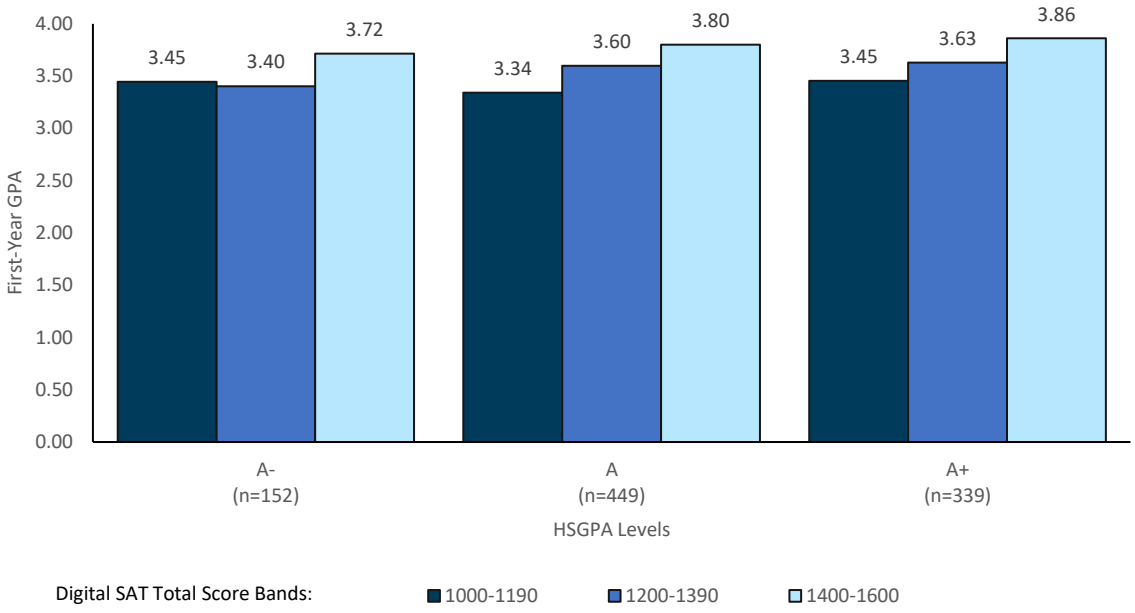
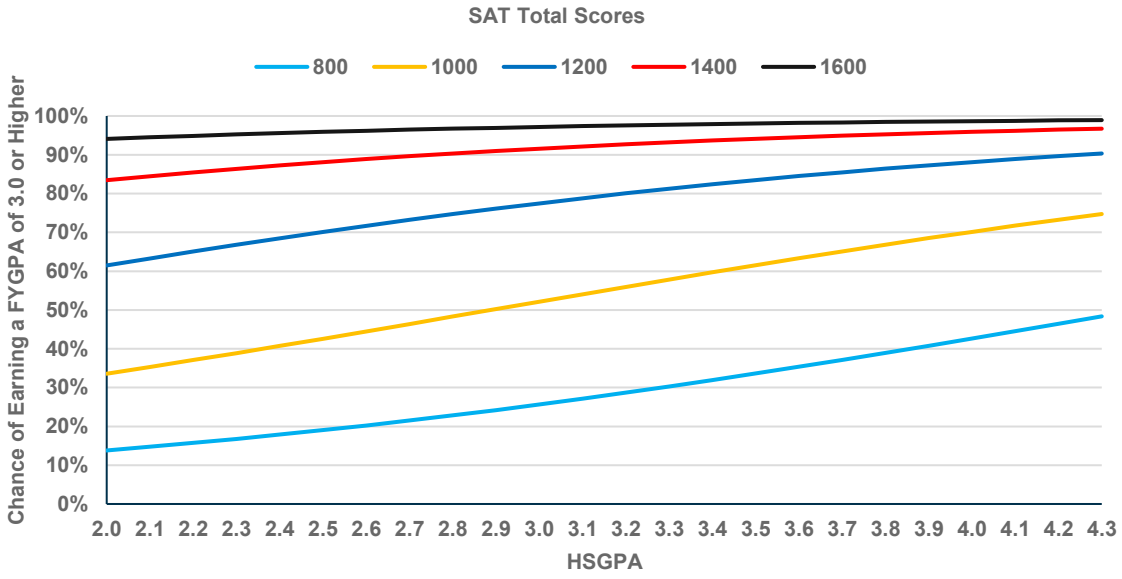


Figure 13 shows STEM majors' estimated probabilities, or chances, of earning a FYGPA of 3.0 or higher given their SAT total score and their HSGPA. As seen in the other figures built on logistic regression analyses, students with the same HSGPA but different SAT scores have different estimated probabilities, or chances, of earning a FYGPA of 3.0 or higher. For example, STEM majors with an HSGPA of 4.0 and an SAT Total score of 1000 have a 70% chance of earning a FYGPA of 3.0 or higher, but students with the same HSGPA and an SAT Total score of 1400 have a 99% chance of earning a FYGPA of 3.0 or higher in this sample. This graph demonstrates how SAT scores (and HSGPA) can quickly and easily inform campus decisions about which students may be successful in competitive academic majors and which students may need additional academic support in order to be successful in those majors.

[5] This value was calculated by subtracting the HSGPA-FYGPA correlation (.52) from the multiple correlation of HSGPA and SAT with FYGPA (.72) to arrive at the SAT incremental validity coefficient (.20). This coefficient is then divided by the HSGPA-FYGPA correlation (.52) and multiplied by 100 to arrive at the increment in predictive utility value of 38%.

Figure 13: Probability of Earning a STEM FYGPA 3.00 or Higher for STEM Majors given SAT Total Score and HSGPA



Credit Hours Earned

In addition to FYGPA, we examined digital SAT score relationships with credits earned in the first year. Given that most bachelor's degree programs require that students earn 120 credits, students completing 30 credits in their first year of college are on track to graduate within four years. As shown in Table 6, individually, the SAT and HSGPA had moderately strong, positive relationships with FY credits earned with correlations of .45 and .39, respectively, and a stronger relationship with FY credits earned when used jointly, with a multiple correlation of .50. This represents a 28% increase in predictive utility over using HSGPA alone.

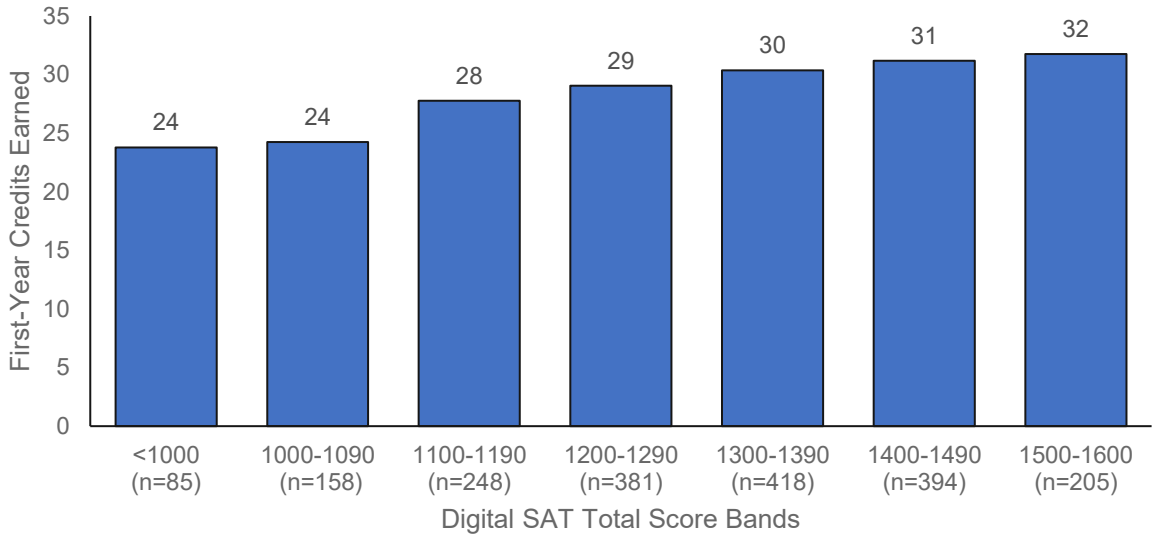
Table 6: Corrected (Raw) Correlation with First-Year Credits Earned (k=11, n=1,889)

Predictor(s)	Correlation	95% CI
SAT Reading and Writing	.39 (.21)	.35-.43
SAT Math	.43 (.28)	.39-.47
SAT Total	.45 (.30)	.41-.49
HSGPA	.39 (.17)	.35-.43
SAT+HSGPA	.50 (.33)	.47-.53
SAT incremental validity beyond HSGPA alone	.11 (.16)	

Note. Confidence intervals calculated using the adjusted correlations after rounding.

Figure 14 illustrates the positive relationship between SAT total scores and first-year credits earned. As SAT total scores increase, the mean number of credits earned[6] also increase in a stairstep manner.

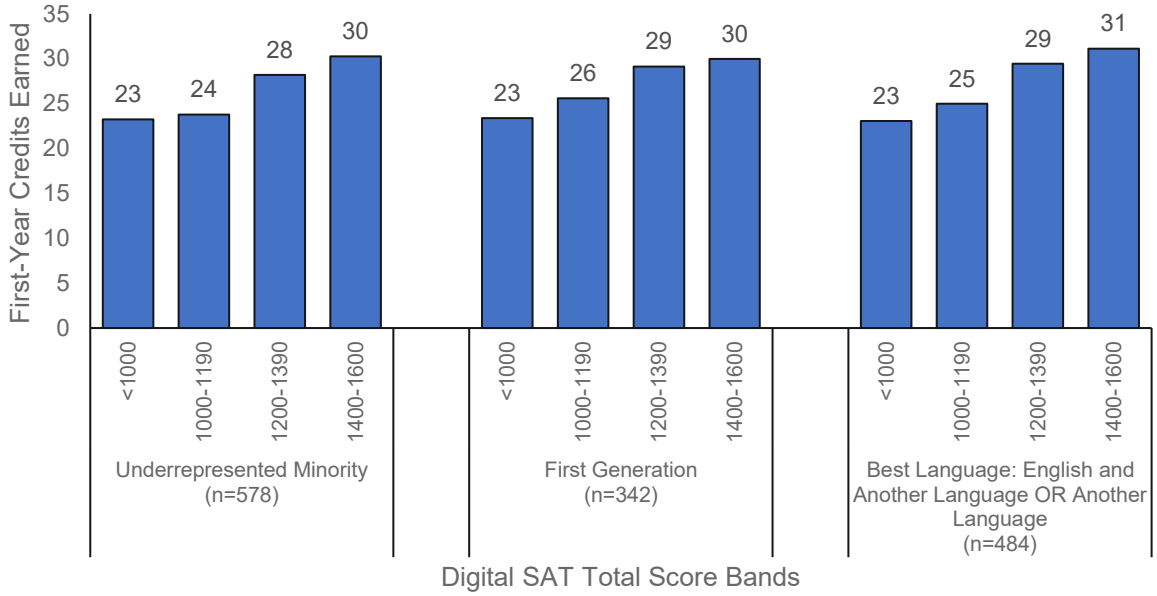
Figure 14: Mean First-Year Credits by Digital SAT Total Score Band



As we did in the FYGPA analyses, we examined the relationship between SAT total scores and credits earned in the first year for underrepresented minority students, first-generation students, and students whose best language is English and another language or another language. The results in Figure 15 indicate that there was a clear positive relationship between SAT total score and credits earned for all three subgroups, with credits earned rising in tandem with SAT total scores.

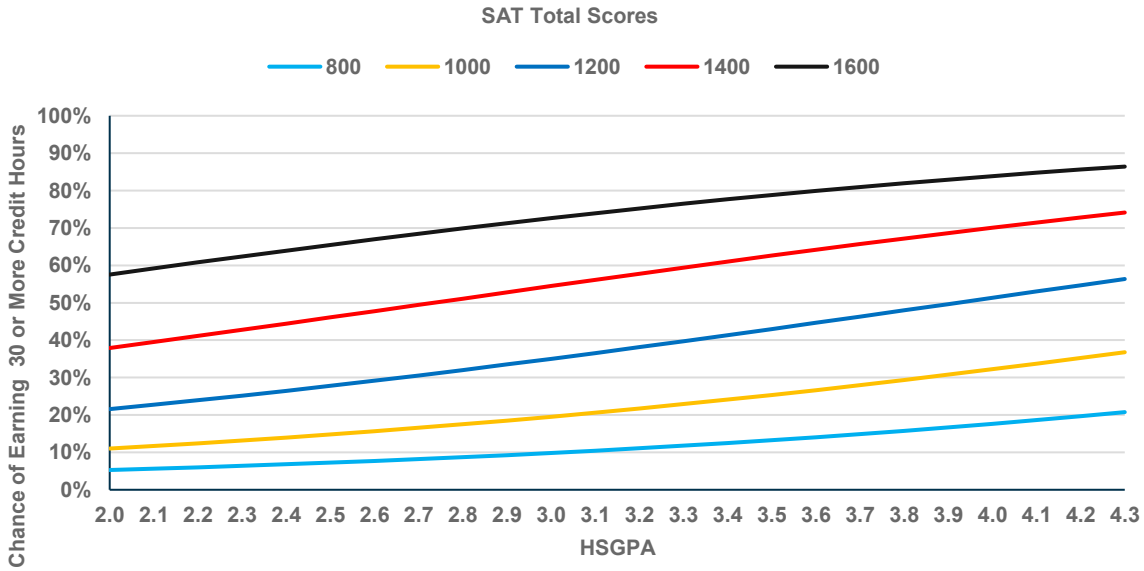
[6] These are credits earned on campus. Advanced Placement® (AP) credits are not included.

Figure 15: Mean First-Year Credits Earned by Digital SAT Total Score Band: Subgroup Analyses



Lastly, in Figure 16, we present the results of the logistic regression analyses in which we used SAT total scores in conjunction with HSGPA to determine students' chances of earning 30 or more credits in their first-year of college. For students with the same HSGPA, their chances of earning 30 or more credits in their first year vary according to their SAT scores. As an example, for students in this study with an HSGPA of 4.0 and SAT total scores of 1600, 1400, 1200, 1000, and 800, their estimated chances of earning 30 or more credits were 84%, 70%, 51%, 32%, and 18%, respectively. Without SAT scores, the estimated chances for these students would be identical. **These findings demonstrate the value of using SAT scores in conjunction with HSGPA versus the use of HSGPA alone when identifying students who may struggle to progress toward bachelor's degree completion within four years.**

Figure 16: Chance of Earning 30 Credits in the First Year, given SAT Total Score and HSGPA



Conclusion

This is the second study to analyze relationships between digital SAT scores and early college outcomes. Paralleling the results of the first study (Marini et al, 2023), the results of the current study show that digital SAT scores are as predictive of college performance as paper and pencil SAT scores, and they continue to meaningfully improve our ability to predict college performance above HSGPA alone. We also saw strong positive digital SAT score relationships with FYGPA for subgroups such as underrepresented minority students, first-generation college students, and students whose best language was another language or English and another language.

When performance in specific first-year coursework domains was examined, we saw strong relationships between SAT Math scores with both math and STEM course grades as well as a strong relationship between SAT Reading and Writing section scores and students' performance in courses other than math. When digital SAT scores were examined for students majoring in STEM fields, there were even stronger relationships observed than for the overall sample, with a 38% improvement in prediction of college performance by the SAT above the use of HSGPA alone.

Moving beyond GPA, the current study also found a positive relationship between SAT scores and the number of credits earned, a proxy for understanding progress toward degree completion. These findings suggest that students with higher SAT scores tend to not only earn higher grades but also make quicker progress toward completing a bachelor's degree.

In sum, these findings give institutions confidence that digital SAT scores will provide valuable insights for understanding students' readiness for college, course placement and academic major field decisions, scholarship and honors program decisions, and identifying students who may need academic support. After the digital SAT launches in the U.S. in 2024, we will also study the first entering college cohort with digital SAT scores to longitudinally examine digital SAT score relationships with college outcomes, across a large national sample of students and institutions.

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Appendices:

Table A 1: Institutional Characteristics of the Study Population for Sample Recruitment

	Variable	Sample (k=11)	Population (k=788)
U. S. Region	Midwest	9%	21%
	Mid-Atlantic	9%	26%
	New England	18%	11%
	South	27%	22%
	Southwest	18%	9%
	West	18%	10%
Control	Public	64%	40%
	Private	36%	60%
Admittance rate	Under 25%	27%	6%
	25% to 50%	9%	9%
	51% to 75%	55%	37%
	Over 75%	9%	48%
Undergraduate Enrollment	Small	0%	52%
	Medium	0%	20%
	Large	9%	14%
	Very Large	91%	14%

Note. Percentages may not sum to 100 due to rounding. In order to be included in the study population used to develop a representative sampling plan for U.S. four-year institutional participation, institutions had to have at least 250 first-year students, of which at least 75 had SAT scores, at least 15% of first-year students had to have SAT scores, and the institution had to have published admittance rates. Institutions in the U.S. Virgin Islands and Puerto Rico were excluded. Undergraduate enrollment was categorized as follows: small: 4,999 or less; medium: 5,000 to 9,999; large: 10,000 to 19,999; and very large: 20,000 or more.

Table A 2: Student Characteristics of the Current Study Sample, 2020 SAT Validity Study Sample, and the 2022 College-Bound Seniors Population

	Category	Sample (N=1,889)	2020 Validity Study Sample (N=181,718)	2022 College-Bound Seniors (N=1,737,678)
Gender	Male	42%	44%	48%
	Female	58%	56%	51%
	Another/Omitted	<1%	0%	<1%
Ethnicity	American Indian/Alaska Native	<1%	<1%	1%
	Asian	33%	12%	10%
	Black/African American	6%	7%	12%
	Hispanic/Latino	21%	16%	23%
	Native Hawaiian/Other Pacific Islander	<1%	<1%	<1%
	White	33%	58%	42%
	Two or More Races	4%	5%	4%
	No Response	3%	2%	8%
Best Language	English Only	74%	86%	71%
	English and Another	24%	13%	17%
	Another	2%	2%	3%
	No Response	<1%	<1%	9%
Highest Parental Education	No High School	4%	4%	6%
	High School Diploma	14%	16%	21%
	Associate Degree	4%	6%	5%
	Bachelor's Degree	35%	39%	28%
	Graduate Degree	39%	35%	23%
	No Response	3%	1%	17%