



High School Curriculum, Diplomas, & SAT Scores

By T.J. Tuttle

How high school curriculum and diploma choices relate to SAT scores and college choice

Each year, the SAT is administered to more than one million college-bound high school juniors and seniors across the nation. For the most part, the SAT is the college admission test of choice in Indiana. A comparatively high percentage of students in Indiana high schools take the SAT when compared to other states. For these reasons, SAT scores may be viewed as indicators of both intent to pursue and preparedness for postsecondary education.

Curriculum choices in high school, from ninth grade on have a direct effect on SAT scores and college choice. A series of recent studies conducted by the IPAS project looking at national and Indiana college students from the (public) high school class of 2000 have shown how curriculum planning, course selection, and resulting diplomas relate to SAT scores and pathways to college.

Key findings include:

- The Core 40 curriculum was associated with higher SAT scores than the standard diploma in Indiana and the U.S.
- Taking courses associated with Honors diplomas was associated with substantially higher SAT scores in Indiana and the U.S. even after controlling for other factors influencing achievement.
- All types of advanced courses were associated with higher SAT scores after controlling for student background and courses taken.
- Having an “A” GPA in high school courses also improved SAT and mitigated course effects.

DOES COURSE SELECTION RELATE TO SAT SCORES?

Course selection had an impact on students’ SAT scores, particularly for students who took multiple advanced courses whether they were “A” or “B” GPA students, showing that a rigorous curriculum benefits more students than just high achievers. For example—look at the differences between students who took calculus plus two other advanced courses and students

Table 1. Advanced coursework & GPA with predicted SAT scores.

Grade point average	Calculus, Honors history Honors English	Calculus & Honors history	Calculus, & Honors English	Honors History & Honors English	No advanced courses
“A” student	1267	1210	1208	1152	1025
“B” student	1161	1118	1105	1039	918

Table 1 illustrates the predicted scores based various course choices. The table shows a difference of 349 points between a “B” student with no advanced courses and an “A” student with calculus and two other honors courses. There is a systematic progression from left to right or right to left that illustrates the cumulative advantage of a more challenging curriculum as measured by the SAT.

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who took no advanced courses (Table 1). The “B” student with the two advanced courses AND calculus averaged a score of 1161 versus 918 for the “B” student who took no advanced courses—a 239 point difference. A similar point difference is observed for the “A” student.

Bottom line: Advanced coursework can lead to higher SAT scores for all students, not just “A” students. A’s in easy courses are not necessarily better than B’s in more advanced courses in terms of their impact on SAT scores.

Mathematics

Taking advanced math courses can lead to higher SAT scores. Since half of the SAT combined score is math, the advantage of an advanced math course sequence capped by calculus is immediately clear.

Controlling for coursework in other subjects, and other demographic and background variables such as race and income, students taking advanced math courses scored significantly higher on the SAT than students whose

highest math was Algebra II. Students taking calculus scored 100 points higher, and students taking pre-calculus or trigonometry scored 50 points higher.

Calculus served as a heavy “plus” factor when combined with any other advanced courses, as seen from Table 1. For both “A” and “B” GPA students who took calculus and one other advanced course, those who took calculus scored on average at least 50 points higher than students who did not take calculus but took two other Honor courses.

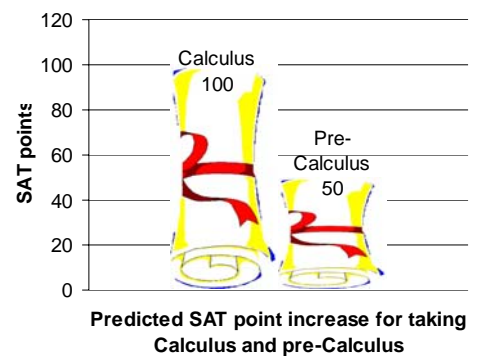


Figure 1. The average SAT score differences resulting from taking Calculus and pre-calculus/trigonometry and the SAT compared to Algebra II or lower math courses.

English

In looking at students who took Honors English, it was found that these students scored an average of 38 points higher on the SAT than students who had not taken any Honors English. Students who took a literature course from a different historical period scored an average of 32 points higher than students who had not.

Other Subjects

SAT score improvement was associated with advanced coursework in all subjects examined including science and history. Most students who took physics, which had a positive impact on SAT scores, had also taken biology and chemistry.



Contact IPAS for more

Further information on IPAS research; additional briefs and related publications are available from the IPAS website at www.indiana.edu/~ipas1/resources.html.

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Does foreign language study help students on the SAT even though there is no foreign language section on the test?

Foreign Language and the SAT—

*The results speak for themselves — Students who took four years of foreign language scored on average 38 points **higher** than students who took between one-to-three years. Students with no foreign language study scored on average 63 points **lower** on the SAT than students with one to three years of study. Study of Latin was associated with a 30 point increase on the SAT.*

“We believe foreign language study helps students to understand language structure and vocabulary, important aspects of the SAT,” noted project research analyst and statistician Glenda D. Musoba.

Differences in SAT points for taking foreign languages or not

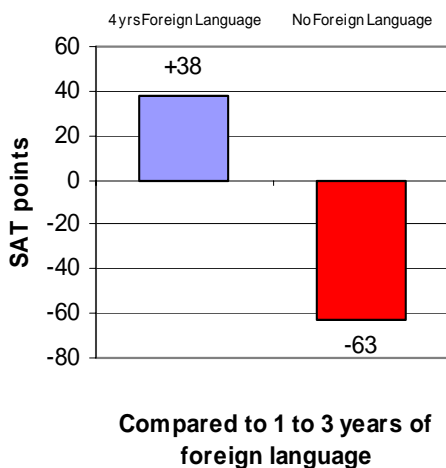


Figure 2. Foreign languages and the SAT. Students with four years of foreign language scored, on average, 38 points higher than students with one-to-three years of study. Students who did not take foreign language scored, on the average, 63 points lower than students with one to three years of study.

Intensity of Advanced Courses

Students who elect to take a challenging course load early (from 8th grade on), and continue on that path are likely to see the results on their SATs. Both Indiana students and students nationwide showed a strong relationship between test scores and the number of years they took of advanced courses. As illustrated in Table 2, the number of years of advanced coursework translated into point increases on the SAT for most students.

Practice may not make perfect, BUT...

Taking the PSAT helped. Prior testing experience was also found to be an advantage to students in raising their SAT scores. This is known as the “practice effect.” When we took curriculum and background variables into effect, students who took the PSAT still scored 29 points higher than students who did not take it.

Table 2. Number of advanced high school courses and average SAT score increase

Advanced COURSE INTENSITY	SAT point increase
taking 19 courses versus 20 courses (5 courses x 4 years)	37 points
taking 18 vs. 20	48 points
taking 17 vs. 20	62 points

Students who elected to take 20 advanced courses--or 5 courses per year for four years averaged 37 points greater on their SAT than students who took only 19 courses. 17 courses averaged 62 points less than those who took 20 courses.

DOES TYPE OF DIPLOMA PROGRAM RELATE TO SAT SCORES?

Indiana students can receive a regular diploma, a Core 40 diploma (40 credits of basic college prep courses), or an Academic Honors diploma, which requires seven additional credits and carries the highest prestige. The average SAT of students varied with their diploma types.

Controlling for differences in variables such as ethnicity, income, location, and grades, Indiana students who earned the Academic Honors diploma scored an average of 75 points higher on the SAT than students who earned a regular diploma. For comparison, national students with the equivalent curriculum scored 97 points higher on the SAT (Figure 3). The Core 40 was associated with an average of 37 SAT points higher than the regular diploma.

DO SAT SCORES AND DIPLOMA TYPES RELATE TO COLLEGE CHOICE?

Guidance counselors have known it for years and students have often discovered it too late: SAT scores play an important role in college admission, college choice and scholarships. In examining the Indiana class of 2000, students with higher SAT scores (1097 and higher) were two and a half

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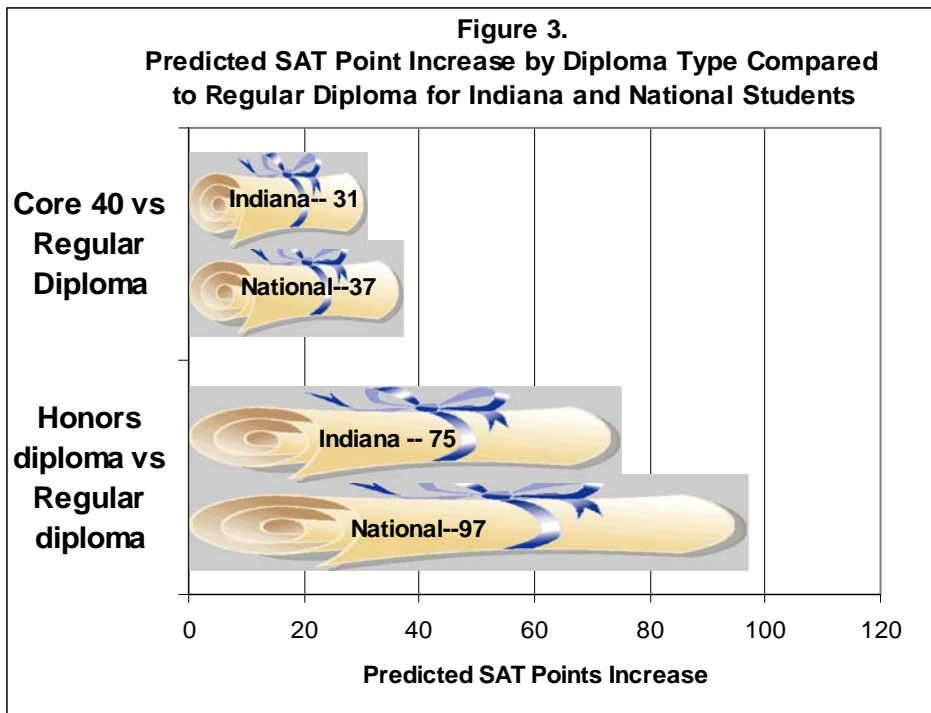


Figure 1.

For Indiana Students, a Core 40 diploma increased SAT scores by an average of 31 points over the regular diploma, while the Honors diploma increased SAT points by an average 75 points over the regular diploma. National scores based on equivalents.

times more likely to attend a research university (IU or Purdue) than students with mid-range SAT scores. Higher SAT scores lead to more freedom when choosing colleges, in both admission and scholarship availability.

Compared to students who graduated with a regular high school diploma, students with an Academic Honors diploma were 11 times more likely to attend a four-year universities than a two-year college and seven times more likely to attend a research campus.

Students with a Core 40 diploma over a regular diploma were four times more likely to (be eligible and) attend a research university and eight times more likely to attend a state university than a two-year college.

Implications:

The results of these studies clearly illustrate that a rigorous high school curriculum has a direct payoff in higher SAT scores which results in expanded college choices. Advanced coursework in high school and pursuing more challenging diplomas were positively related to SAT scores, not just for “A” students either. Students who took the PSAT also experience the “practice effect” reflected in higher SAT scores. Pursuing a rigorous high school curriculum is not only important for students in developing advanced academic skills, knowledge, and reasoning, but also in expanding access to a variety of college opportunities.

Notes:

1. This report is based on OLS regression analyses of SAT scores from the 2000 cohort: a national sample and Indiana SAT test takers who graduated in 2000. Regressions explain or predict SAT scores, based on the simultaneous consideration of a group of variables, portioning out the difference in score. Regressions do not prove causality; therefore average results may not be matched by an individual student.

2. The figures presented in this report should be interpreted as the change in SAT score while at the same time controlling for other variables such as: gender, ethnicity, family income, parent education, school locale, educational aspirations, class rank, other coursework and GPA.

3. Study looked at pathways of the class of 2000 (public high schools only) who enrolled FT in two- to- four year public institutions for fall 2000.

4. Many of the data on coursework were based on student self-reported information on the SAT questionnaire.

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Analysis for this project carried out by Glenda Droogsma Musoba, Ph.D. and Cheung Guen Chung, M.S. for the Indiana Pathways Project.
For more information, see www.indiana.edu/~ipas1/resources.html
For other questions, contact IPAS at retain@indiana.edu.