UC and the SAT:

Predictive Validity and Differential Impact of the SAT I and SAT II at the University of California

Saul Geiser with Roger Studley
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University of California President Richard C. Atkinson's proposal to discontinue use of the SAT I in college admissions in favor of achievement tests,[2] such as the SAT II, did not come out of the blue. UC is one of the few higher educational institutions in the nation that requires applicants to take both the SAT I and the SAT II achievement tests, so that UC has extensive experience with the two tests. Two years before President Atkinson made his proposal, BOARS (Board of Admissions and Relations with Schools), the UC faculty committee charged with formulating admissions policy, voted to de-emphasize the SAT I and to increase the weight given to the SAT II in its "Eligibility Index," a formula used to identify the top 12.5% statewide pool of California high school graduates based on their grades and standardized test scores. Subsequently, President Atkinson's speech to the American Council of Education in February 2001 prompted the growing national debate about the validity and role of the SAT in college admissions.[3]

What *is* UC's experience with the SAT I and SAT II, and what do our data show? This paper presents systemwide data for UC's eight undergraduate campuses, examining the relationship between SAT scores and academic outcomes based on the records of almost 78,000 first-time freshmen who entered UC over the past four years. The paper is divided into four parts. Part I examines the relative power of the SAT I and the SAT II achievement tests in predicting students' success at UC. Part II analyzes the conditioning effects of socioeconomic status and family background on the predictive validity of these tests. Part III looks at the differential impact of the SAT I and the SAT II on various racial/ethnic groups. Part IV concludes with a discussion of the implications of these findings for admissions policy.

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[1] Saul Geiser is director of research and evaluation and Roger Studley is senior research analyst in admissions and outreach at UC Office of the President. We wish to thank the following individuals for their constructive criticism of earlier drafts of this paper, although the authors remain solely responsible for the findings and conclusions herein: Michael Brown, Michael Feuer, Ed Haertel, Dan Koretz, Bob Linn, Juliet Shaffer, Rich Shavelson and Gregg Thomson.

[2] "Achievement" tests refer to tests that are designed to measure students' mastery of specific subject-matter areas, rather than generalized aptitude, intelligence or reasoning abilities.

[3] Richard C. Atkinson, "Standardized Tests and Access to American Universities," The 2001 Robert H. Atwell Distinguished Lecture, delivered at the 83rd Annual Meeting of the American Council on Education, Washington, D.C, February 18, 2001. The full text of the lecture is available at http://www.ucop.edu/pres/welcome.html.

I. Predictive Validity of the SAT I and the SAT II Achievement Tests

The primary rationale for using standardized tests, such as the SAT, in college admissions is to predict success in college. Quoting from a recent publication of the College Board,

> *The SAT has proven to be an important predictor of success in college. Its validity as a predictor of success in college has been demonstrated through hundreds of validity studies. These validity studies consistently find that high school grades and SAT scores together are substantial and significant predictors of achievement in college* (Camara and Echternacht, 2000, p. 9).

Yet while it is true that the "predictive validity" of the SAT I has been widely studied, the same cannot be said of the SAT II achievement tests. One reason for that neglect is that very few colleges and universities require the SAT II -- the University of California being the largest and most notable exception. In fact, UC has required applicants to submit *both* SAT I (or ACT) scores *and* SAT II scores since 1968**.** As a result, UC has an extensive database on the two tests and is uniquely positioned to assess their relative utility in predicting success in college.

Following are initial findings on the relative contribution of high-school grade-point average (HSGPA), SAT I and SAT II scores in predicting college success for 77,893 first-time freshmen who entered UC over the past four years, from Fall 1996 through Fall 1999, inclusive.[4] SAT I scores used in this analysis represent the composite of students' scores on the verbal and math portions of that test, while the SAT II is the composite of three achievement tests that UC uses in determining students' eligibility for admission: SAT II Writing, SAT II Mathematics, and an SAT II Third Subject test of the student's choosing. Analysis of the individual components of the SAT I and SAT II, including the SAT II Third Subject test, is presented later in this paper.

The criterion of collegiate "success" employed here is the same as that used by the College Board in the majority of its research on the SAT – freshman GPA. Quoting again from the College Board:

> *The overwhelming majority of these studies use … freshman GPA as the criterion representing success in college. Freshman GPA is the most frequently used criterion because:*
> - *The courses that freshmen take are more similar and less variable than at any other year in college, thus minimizing comparability issues that occur with grades;*
> - *Predictor and criterion data are readily available; and*

[4] Excluded from this analysis were students with missing SAT scores or high school GPAs; students who did not complete their freshman year and/or did not have a freshman GPA recorded in the UC Corporate Student Database; freshmen at UC Santa Cruz, which does not assign conventional grades; and freshmen entering UC Riverside in 1997 and 1998, in which years the campus data upload into the UC Corporate Student System had extensive missing data.

- *Freshmen grade averages are highly correlated with cumulative grade averages* (Camara and Echternacht, 2000, p. 1).

Many have criticized the narrowness of freshman GPA as a measure of success in college and have urged the use of other criteria, such as college graduation rates. We are now examining the relationship between SAT scores and persistence and graduation rates at UC, and those findings will be presented in a later analysis. For purposes of the present analysis, however, we have chosen to focus on UC first-year GPA (UCGPA), because freshman GPA is by far the most commonly employed criterion of "success" in studies of the predictive validity of college admissions tests and because use of the SAT is most often justified on this basis.

Explained Variance in UC Freshman GPA

Table 1 shows the percentage of explained variance in UCGPA that is accounted for by various predictor variables.[5] In this initial analysis, three predictor variables were studied: HSGPA, SAT I, and SAT II composite scores.[6] The effects of these predictor variables on UCGPA were analyzed both singly and in combination, as displayed below:[7]

Table 1
Percent of Variance in UC Freshman GPA
Explained by HSGPA, SAT I and SAT II Scores

	1996	1997	1998	1999	1996-1999
Predictor Variables/Equations:					
(1) **HSGPA**	17.0%	16.7%	14.7%	12.9%	15.4%
(2) **SAT I**	13.8%	10.8%	12.2%	14.2%	13.3%
(3) **SAT II**	16.4%	14.4%	15.6%	16.4%	16.0%
(4) **SAT I + SAT II**	16.7%	14.4%	15.6%	16.8%	16.2%
(5) **HSGPA + SAT I**	21.9%	20.1%	19.2%	20.4%	20.8%
(6) **HSGPA + SAT II**	23.0%	21.7%	21.1%	21.5%	22.2%
(7) **HSGPA + SAT I + SAT II**	23.2%	21.7%*	21.1%*	21.9%	22.3%
SAT I increment: [(7)-(6)]	0.2%	0.0%	0.0%	0.4%	0.1%

* SAT I not statistically significant in prediction equation; all other variables are statistically significant at <.01 level.

[5] The proportion of explained variance, also known as the *coefficient of determination* or R^2, represents the proportion of total variation in an outcome variable, such as UCGPA, that is accounted for or "explained" by a predictor variable, such as HSGPA or SAT scores. R^2 ranges from 0 to 1 and can also be expressed as a percentage, as shown in the table above. In 1996, for example, HSGPA accounted for 17.0% of the variance in UC freshman grades.

[6] Under current UC policy on eligibility for admissions, scores on different tests or sub-tests are summed to produce an overall composite score. For the SAT I, the math and verbal sections are summed to produce an SAT I composite score; for the SAT II, students are required to take two tests – Writing and Mathematics Level IC or Level IIC – plus a third subject test of the student's choosing, and scores on the three tests are summed. The maximum possible composite score is 1600 on the SAT I, and 2400 on the SAT II. HSGPA is an honors-weighted GPA with additional grade-points for honors-level courses; HSGPA is uncapped and may exceed 4.0.

[7] For the technical reader, the full regression results and other data upon on which this and the following tables are based are available at the UC Office of the President website at www.ucop.edu/sas/researchandplanning.

Three main conclusions can be drawn from this table:

- First, looking at the predictor variables individually – rows (1) through (3) in the table -- SAT II scores were the best *single* predictor of UCGPA in two of the four years studied (1998 and 1999), and also the best single predictor for the pooled, 4-year data. Over the four-year period, SAT II scores accounted for the greatest percentage of variance in UCGPA, 16.0%, followed by HSGPA with 15.4%. SAT I scores ranked last, accounting for 13.3% of the variance in a single-variable prediction equation.

- Second, using the predictor variables in combination – rows (4) through (7) in the preceding table – the percentage of explained variance increases beyond that which is possible using any one variable alone. Thus, the three predictor variables combined – HSGPA, SAT I and SAT II (row 7) – account for 22.3% of the total variance in UCGPA over the past four years (row 7, right-hand column).

- Third and finally, it is evident that SAT I scores add very little, if any, incremental power in predicting UC freshman grades *after* SAT II scores and HSGPA are taken into account. SAT II scores and HSGPA together account for 22.2% of the variance in UCGPA in the pooled, 4-year data (row 6, right-hand column). Adding SAT I into the equation (row 7) improves the prediction by an increment of only 0.1% in the pooled, 4-year data. Indeed, in two of the four years (1997 and 1998), SAT I scores add nothing to the percentage of variance explained.[8]

Standardized Regression Coefficients

Standardized regression coefficients, also known as "beta weights," are another indicator of the relative strength of different predictor variables.[9] Table 2 (next page) displays the

[8] To those unfamiliar with prediction studies, the fact that HSGPA, SAT I and SAT II scores together account for less than a quarter of the total variance in UCGPA may seem odd, but this relatively low level of observed prediction is the norm. One reason is a phenomenon known as *restriction of the range*, that is, the fact that students with low test scores and grades often do not apply to selective institutions such as UC, and among those who do, only those with high test scores and grades tend to be admitted. As a result, there is too limited a range of test scores and grades among admitted students with which fully to assess the predictive power of these criteria. Statistical techniques can be used to "correct" observed correlations for range restriction using national data on SAT takers, but those techniques depend on assumptions that cannot be directly verified, such as the assumption that the relationship between test scores and college grades is linear and identical across the observed and unobserved ranges of the data, or that the conditional variance is homogeneous across the observed and unobserved ranges. Moreover, for purposes of *comparing* the predictive validity of the SAT I and SAT II, there is no straightforward method to "correct" the observed relationships, since the national populations of SAT I and SAT II takers are so different (the population of SAT II takers is much smaller and includes a much larger proportion of high-achieving students than the SAT I population). Among students who enroll at UC, in contrast, the variances of SAT I and SAT II scores are very similar (see www.ucop.edu/sas/researchandplanning), and range-restriction effects therefore do not account for the predictive superiority of the SAT II shown in the UC data. For all of these reasons, it is appropriate to use "uncorrected" regression data when comparing the relative predictive power of the SAT I and SAT II at UC, and only observed statistical relationships are presented in this paper.

[9] Standardized regression coefficients show the number of standard deviations that a dependent variable (e.g., UCGPA) changes for each one standard deviation change in a predictor variable, all other factors held constant. Beta weights are useful in situations such as the present, where the predictor variables involve widely different measurement scales (i.e., HSGPA is on a 4-point scale, while the maxima for SAT I and SAT II composite scores are 1600 and 2400, respectively). By taking into account such differences in units of measurement, standardized coefficients permit more direct comparison of the relative weights of different predictor variables within a regression equation.

beta weights for HSGPA, SAT I and SAT II scores, within a combined regression equation (UCGPA = HSGPA + SAT I + SAT II), for the same four years:

Table 2
Standardized Regression Coefficients for HSGPA, SAT I and SAT II Scores

Regression equation: UCGPA = HSGPA + SAT I + SAT II

	HSGPA	SAT I	SAT II
1996	.29	.07	.21
1997	.30	.01*	.24
1998	.26	.02*	.26
1999	.24	.11	.22
1996-99	.27	.07	.23

* Not statistically significant at <.01 level.

The pattern of beta weights shown here is similar to the pattern of explained variance shown previously. High school GPA has the most predictive weight followed closely by SAT II composite scores, while the SAT I ranks a distant third in each year and for the pooled, 4-year data. In fact, in two of the four years (1997 and 1998), SAT I scores are not statistically significant predictors of UC freshman grades within a regression equation that also includes SAT II scores and HSGPA.

Variation across UC Campuses

Table 3 below shows the relative weights for HSGPA, SAT I and SAT II scores in predicting freshman GPA at each UC campus:

Table 3
Standardized Regression Coefficients for HSGPA, SAT I and SAT II Scores by UC Campus, 1996-1999

Regression equation: UCGPA = HSGPA + SAT I + SAT II

	HSGPA	SAT I	SAT II
UC Berkeley	.21	-.02*	.27
UC Davis	.30	.04	.27
UC Irvine	.25	.09	.21
UC Los Angeles	.23	.05	.26
UC Riverside	.31	.16	.10
UC San Diego	.27	.03*	.25
UC Santa Barbara	.36	.11	.15
UC Santa Cruz**	n/a	n/a	n/a
UC System	.27	.07	.23

* Not statistically significant at <.01 level.
** Does not assign conventional grades.

As Table 3 makes clear, the superior predictive power of the SAT II (and HSGPA) is also evident at individual campuses. The SAT II is a consistently stronger predictor of freshman grades than the SAT I at all UC campuses except one, UC Riverside, which is the least selective campus in the UC system in terms of its admissions requirements. At the most selective UC campuses – Berkeley, UCLA and San Diego – the difference in beta weights between the SAT II and SAT I is largest, suggesting that the predictive superiority of the SAT II may be even greater in a more selective admissions context.

Variation by High School of Origin

Table 4 below examines the predictive weights of HSGPA, SAT I, and SAT II scores controlling for students' high school of origin. One of the arguments sometimes made for the SAT I is that, insofar as it is more "curriculum independent" than the SAT II, it may be more useful in identifying high-potential students in low-performing schools, where the curriculum tends to be weakest. Table 4 shows the standardized regression coefficients for HSGPA and SAT scores for UC students from each API quintile of California high schools; the API (Academic Performance Index) is a measure developed by the California Department Education to rate school performance based on the state's Standardized Testing and Reporting (STAR) system for K-12:

Table 4
Standardized Regression Coefficients for HSGPA, SAT I and SAT II Scores by School API Quintile, 1996-1999

Regression equation: UCGPA = HSGPA + SAT I + SAT II

School API Quintile		HSGPA	SAT I	SAT II
5	(high)	.33	-.01*	.20
4		.32	.01*	.20
3		.29	.03*	.25
2		.28	.07	.22
1	(low)	.25	.12	.18
All Schools		.27	.07	.23

* Not statistically significant at <.01 level.

As this table demonstrates, the SAT II is a better predictor of UC freshman grades than the SAT I across all school API quintiles. Although it is true that the beta weights for the SAT I tend to be larger in lower-performing than in higher-performing schools, the SAT II is still clearly the superior predictor at all levels.

Variation by Academic Discipline

Table 5 (next page) shows standardized regression coefficients for HSGPA, SAT I and SAT II scores controlling for students' intended major at UC. This analysis is important

in order to test the hypothesis that students who score highest on the SAT I tend to enter more difficult academic disciplines such as engineering, where grading standards are tougher. Such differences across disciplines might therefore mask the true predictive power of the SAT I, which would become apparent only after controlling by major:

Table 5
Standardized Regression Coefficients for HSGPA, SAT I and SAT II Scores by Intended Major, 1996-1999

Regression Equation: UCGPA = HSGPA + SAT I + SAT II

	HSGPA	SAT I	SAT II
General/Undeclared	.27	.08	.22
Social Sciences/Humanities	.28	.11	.20
Biological Sciences	.31	.12	.25
Physical Sciences/Math/Engineering	.28	-.05	.30

As Table 5 demonstrates, the data provide no support for the hypothesis that the SAT I is a better predictor of freshman grades than the SAT II in certain academic disciplines than others. In fact, in the physical sciences and engineering, which are among the most competitive academic disciplines at UC, SAT I scores have *negative* predictive weight within a regression equation that simultaneously takes into account HSGPA and SAT II scores. Across all other major disciplinary areas as well, the SAT II is consistently the stronger predictor of student performance at UC than the SAT I.

Directions for Further Research

The above findings make a strong presumptive, if not yet conclusive, case for the superiority of the SAT II over the SAT I in predicting students' success at UC. The analysis needs to be extended, however, in at least one other important direction: Analysis of outcome indicators other than freshmen grades, such as student persistence and graduation rates or cumulative GPA at graduation, and their relationship to SAT I vs. SAT II scores. Data needed to conduct these analyses were not readily accessible at the UC system level at the time of this writing, but the data have now been developed and their analysis will be presented in a later paper.[10] Nevertheless, one conclusion that can be drawn at this time is the following: If the prediction of student "success" as measured by freshman grades is the *raison d'etre* for the use of standardized tests in college admissions, as the College Board and others have emphasized in the overwhelming majority of validity studies, then the SAT II is unquestionably superior to the SAT I on this standard, according to the UC data.

[10] Preliminary logistic regression results regressing UC 6-year graduation rates on HSGPA, SAT I and SAT II scores show the same pattern of beta weights presented here for UC freshman GPA: HSGPA has the greatest predictive weight followed by the SAT II, with the SAT I a distant third.

II. Conditioning Effects of Socioeconomic and Other Variables on the Predictive Validity of the SAT I and SAT II

The next set of analyses examines the impact of socioeconomic factors on the predictive validity of the SAT I and SAT II achievement tests. In particular, we examine the impact of two indicators of socioeconomic status (SES): (1) family income, using the log of family income in constant 1998 dollars,[11] and (2) parents' education, in years, for the student's highest-educated parent.[12] The following findings are based, once again, on the pool of freshmen entering UC from Fall 1996 through Fall 1999.[13]

Table 6 below shows the standardized regression coefficients for HSGPA, SAT I and SAT II scores in predicting UC freshman GPA *before* and *after* inclusion of SES variables within the regression analysis. That is, the first column in Table 6 shows the beta weights derived by regressing UCGPA on HSGPA, SAT I and SAT II scores, while the second column shows the results of regressing UCGPA on HSGPA, SAT I and SAT II scores *plus* family income and parents' education. In simplified form,

Equation (1): UCGPA = HSGPA + SAT I + SAT II
Equation (2): UCGPA = HSGPA + SAT I + SAT II + INCOME + EDUCATION

Table 6
Standardized Regression Coefficients for HSGPA, SAT I and SAT II Scores Before and After Consideration of SES

Predictor Variable:	Before SES Considered (Equation 1)	After SES Considered (Equation 2)
HSGPA	.27	.28
SAT I	.07	.02
SAT II	.23	.24
Family Income	x	.03
Parents' Education	x	.06

[11] The logarithm of family income is used here to take into account the diminishing marginal effects of income on UCGPA and other variables. That is, a $10,000 increase in income is likely to have a larger effect for a student whose family earns $35,000 annually than for a student whose family earns $135,000. Use of the log of income is standard practice in economic research.

[12] Data on family income and parents' education are drawn from information provided by students on the UC admissions application. UC has periodically conducted analyses comparing family income data from the admissions application with that from the UC financial aid application, which is subject to audit. These analyses show that, while there are substantial differences in some cases, in general data from the two sources are very similar.

[13] It should be noted that the pool used in the following regression analysis is somewhat smaller than that used in the preceding analyses, which were based on the set of 77,893 students entering UC between Fall 1996 and Fall 1999 for whom complete information was available on HSGPA, SAT I and SAT II scores, and UC freshmen GPA. The following analysis is further limited to the subset of 66,584 students from this group for whom complete information was also available on family income and parent's education. This subset of students closely resembled the larger pool with respect to demographic characteristics such as race/ethnicity (see www.ucop.edu/sas/researchandplanning).

Table 6 shows that, after taking socioeconomic factors into account within the regression equation, the predictive weights for both the SAT II and HSGPA are undiminished (and in fact increase slightly). In contrast, the weight for the SAT I, which is low to begin with, falls sharply. What these data suggest is that much of the apparent relationship between the SAT I and UC freshman grades is conditioned by socioeconomic factors, whereas the SAT II remains correlated with success at UC even after controlling for socioeconomic background.[14]

This conclusion is supported by our findings on explained variance. Equation (2) above -- including HSGPA, SAT I and SAT II scores, family income and parents' education in the regression equation – accounts for 22.8% of the variance in UC freshman grades in the pooled, 1996-1999 data. Removing SAT I scores from the equation,

Equation (3): UCGPA = HSGPA + SAT II + INCOME + EDUCATION

has no effect on explained variance, which remains at 22.8%. After controlling for socioeconomic background, in short, SAT I scores add nothing to the prediction of freshman grades beyond that which HSGPA and the SAT II already provide.[15]

Conditional Effect Plots

The conditioning effect of socioeconomic and other variables on the predictive power of the SAT I vs. SAT II, reflected in the regression data above, is illustrated graphically in the following conditional effect plots, which show the relationship between SAT scores and UC freshman GPA with other factors held constant. Figures 1 through 3 (following pages) demonstrate that the larger the number and variety of background factors held constant, the clearer the predictive superiority of the SAT II.

Figure 1 shows that, controlling only for high school grades and other test scores, the SAT II has about *three times* the predictive power of the SAT I: Each 100-point increase in SAT II scores adds about .18 of a grade point to predicted freshman GPA, whereas a 100-point increase in SAT I scores adds only about .05 of a grade point.

Figure 2 shows that, controlling for family income and parents' education in addition to high school grades and other test scores, the SAT II has about *ten times* the predictive power of the SAT I: Each 100-point increase in SAT II scores adds about .19 of a grade point to predicted freshman GPA, whereas a 100-point increase in SAT I scores adds only about .019 of a grade point.

[14]The greater conditioning effect of SES on the predictive validity of the SAT I vs. the SAT II is also evident with respect to each of the *component* tests that make up the SAT I and SAT II: SAT I verbal, SAT I math, SAT II Writing, SAT II Mathematics and SAT II Third Test. After taking SES into account, the standardized regression coefficients for both the SAT I verbal and SAT I math decline substantially, while the coefficients for SAT II Writing, Mathematics and the Third Test are almost unchanged. For the technical reader, these regression results may be found on the UC Office of the President website at www.ucop.edu/sas/researchandplanning. Further analysis of the predictive validity of the various components of the SAT I and SAT II, including the SAT II Third Subject test, is presented in Part III of this paper.

[15] See UC Office of the President website at www.ucop.edu/sas/researchandplanning for full regression results.

Finally, Figure 3 shows that, controlling for a still broader array of factors – race/ ethnicity, year of admission, and UC campus of enrollment, in addition to family background, high school grades and other test scores – the SAT II retains its predictive power, but the power of the SAT I virtually disappears: Each 100-point increase in SAT II scores adds about .21 of a grade point to predicted freshman GPA, whereas a 100-point increase in SAT I scores adds only about .001 of a grade point.[16]

These data suggest that the SAT II achievement tests are not only a better predictor, but also a fairer test for use in college admissions insofar as they are demonstrably less sensitive than the SAT I to differences in socioeconomic and other background factors.

[16] The conditional effect plots were developed by regressing UCGPA against the variables considered in Figures 1 through 3 and then, within the resulting regression equation, holding constant all variables except SAT I or SAT II scores at their mean values. The complete regression results upon which the conditional effect plots are based, including regression formulae, means and standard deviations for each variable, are available at the UC Office of the President website at www.ucop.edu/sas/researchandplanning.

Figure 1
Relationship Between SAT Scores and Predicted UC Freshman GPA, Controlling for HSGPA and Other Test Scores

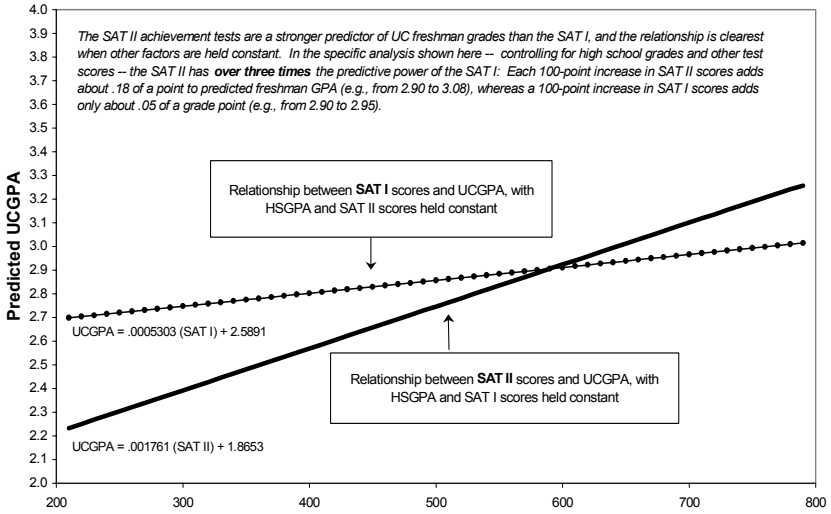


Figure 2
Relationship between SAT Scores and Predicted UC Freshman GPA, Controlling for Family Background, HSGPA and Other Test Scores

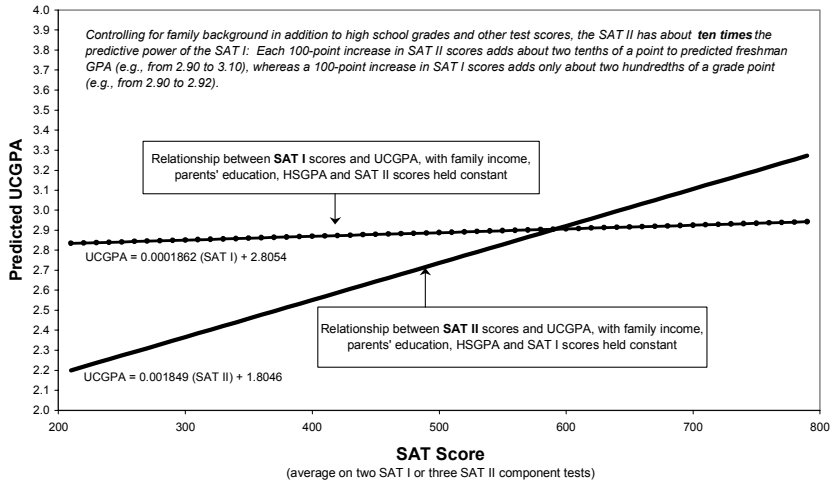
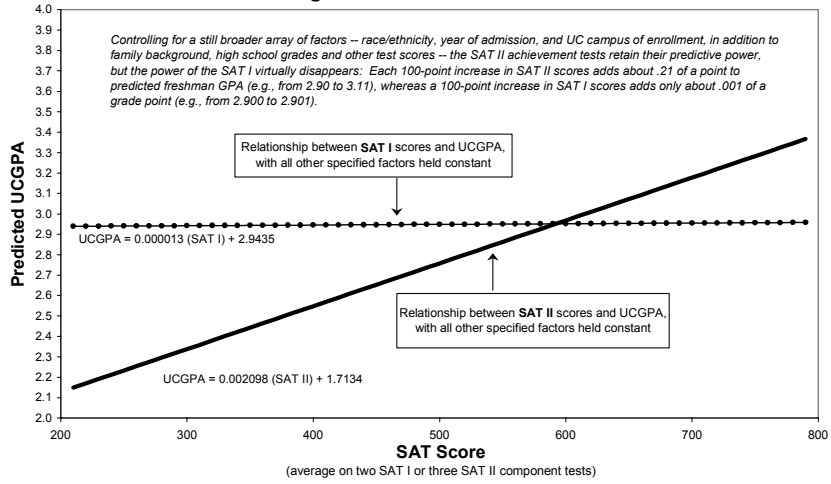


Figure 3
Relationship between SAT Scores and Predicted UC Freshman GPA, Holding Additional Factors Constant



III. Differential Impact of the SAT I and SAT II by Race/Ethnicity

A final question that the UC data allow us to explore is the relative impact of the SAT I and the SAT II on different racial and ethnic groups – a focus of much speculation following President Atkinson's proposal. In particular, speculation has focused upon the role of the SAT II Third Subject Test, which UC has long included along with SAT II Writing and SAT II Mathematics achievement tests in the battery of required tests. Because UC policy allows students to choose which of the SAT II Third Subject Tests to take, and because many Chicano/Latino as well as Asian American applicants opt to take the SAT II language tests,[17] questions have been raised about the extent to which various ethnic groups might be advantaged, or disadvantaged, if the SAT I was discontinued in favor of the SAT II achievement tests.[18]

The following analyses examine, first, how well the SAT I and SAT II (including the Third Subject Test) predict freshman grades for students from different racial/ethnic backgrounds. We then examine the relative performance of students, by race and ethnicity, on the SAT I vs. SAT II achievement tests, both with and without the SAT II Third Subject Test. Finally, the analysis concludes with preliminary findings on the predictive power of the SAT II Third Test itself.

Explained Variance and Over/Under-Prediction by Race/Ethnicity

Table 7 shows the percentage of total variance in UCGPA that is accounted for by HSGPA, SAT I and SAT II scores (including the Third Subject Test) for each racial/ ethnic group. Again, the data are for all freshmen entering UC between 1996 and 1999:

Table 7
Percent of Variance in UCGPA
Explained by HSGPA, SAT I and SAT II Scores
by Race/Ethnicity, 1996-1999

	HSGPA	SAT I	SAT II*	HSGPA + SAT I	HSGPA + SAT II*
African American	9.5%	10.0%	12.3%	15.0%	16.4%
American Indian	8.8%	8.5%	11.1%	12.5%	13.9%
Asian American	15.9%	12.6%	16.9%	20.8%	23.4%
Chicano/Latino	12.0%	10.9%	10.1%	17.3%	16.4%
White	15.6%	10.1%	13.9%	19.1%	20.9%

* Composite includes SAT II Writing and Mathematics plusThird Subject Test.

[17] About half of all Chicano and Latino applicants take Spanish as their Third Test, and almost a quarter of Asian American applicants take Chinese, Japanese or Korean. The distribution of SAT II Third Test takers, by test subject and race/ethnicity, among applicants to UC for Fall 2000 is available at the UC Office of the President website at www.ucop.edu/sas/researchandplanning.

[18] See, for example, "Bilingual Students Use Language to Get a Leg Up on College Admission," *Wall Street Journal,* June 26, 2001.

As Table 7 demonstrates, the SAT II is a substantially better predictor of UC freshman grades than the SAT I for all racial/ethnic groups except Chicano/Latinos, among whom the variance in freshman grades accounted for by SAT II scores (10.1%) is slightly below that for the SAT I (10.9%). The same overall pattern is evident when SAT I and SAT II scores are combined with HSGPA to predict freshman grades, as the tests are normally used in practice.

Table 8 next presents findings on "over-" and "under-prediction" by ethnic group. A phenomenon long noted in the research literature on testing, over-prediction refers to the tendency of the SAT I to predict slightly higher freshman GPAs for underrepresented students than these students actually achieve (Ramist, et al., 1994; Bridgeman, et al., 2000). Given the tendency of the SAT I to over-predict, some have raised the concern that underrepresented students might be disadvantaged if SAT I scores were eliminated in college admissions. Here is what the UC data show:

Table 8
Over- and Under-Prediction of UCGPA
by HSGPA, SAT I and SAT II Scores
by Race/Ethnicity, 1996-1999

Difference between predicted and actual UCGPA (in grade points)

	HSGPA	SAT I	SAT II *	HSGPA + SAT I	HSGPA + SAT II*
African American	+.10	+.06	+.02	.00	-.03
American Indian	+.02	+.06	.00	+.01	-.03
Asian American	+.07	+.07	+.07	+.08	+.08
Chicano/Latino	+.13	+.04	+.10	+.04	+.08
White	-.11	-.08	-.10	-.09	-.10

* Composite includes SAT II Writing and Mathematics plus Third Subject Test.

Like the SAT I, the SAT II achievement tests also exhibit a slight tendency to over-predict UCGPA for minority students, and there are only minor differences, less than one-tenth of a UC freshman grade point for all racial/ethnic groups, between the two tests in this respect.[19] Moreover, when SAT I and SAT II scores are used in conjunction with HSGPA to predict freshman grades, as is the normal practice, these minor differences tend to become even smaller: At most, the difference in prediction is four *hundredths* of a grade point, or the difference between a predicted freshman GPA of 2.50 and 2.54. These data suggest that eliminating the SAT I in favor of the SAT II in UC admissions would have little effect on predicted outcomes for students from any racial/ethnic group.

Racial/Ethnic Differences in Student Performance on the SAT I and SAT II

How do UC students from different racial/ethnic groups perform on the SAT I vs. SAT II? Table 9 (next page) presents mean scores and standard deviations for each

[19] Findings on gender differences will be presented in a later analysis.

racial/ethnic group on three SAT composite scales: (1) SAT I composite including math and verbal, (2) SAT II composite including Writing and Mathematics but not the Third Subject Test, and (3) SAT II composite including the Third Subject Test as well as Writing and Mathematics. [20]

Table 9
SAT I and SAT II Mean Scores and Standard Deviations
by Race/Ethnicity for UC Fall 2000 Applicant Pool

	SAT I Verbal + Math		SAT II Writing + Math		SAT II Writing + Math + Third Test	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
African American	1050	195	1041	191	1559	291
American Indian	1172	172	1144	192	1709	290
Asian American	1217	207	1208	214	1833	337
Chicano/Latino	1061	195	1051	191	1674	312
White	1228	170	1213	186	1811	285
Other/Unknown	1191	194	1178	205	1765	313
All Applicants	1192	200	1180	209	1785	322

As Table 9 shows, mean scores for underrepresented minority applicants – African American, American Indian and Chicano/Latino students – fall below those for Asian American, White and others on all three SAT composites. It is not possible to draw direct comparisons of student performance on the various SAT composites, however, since the composites have different scales and standard deviations (i.e., the maximum possible score on the SAT I composite is 1600 with a standard deviation of 200, whereas the maximum on the SAT II composite that includes the Third Test is 2400 with a standard deviation of 322). To facilitate comparison, Table 10 (next page) converts the above data into *standardized differences*. That is, Table 10 shows the number of standard deviations that average test scores for each racial/ethnic group are above or below the average for all applicants on each of the three SAT composites.

Table 10 reveals a number of interesting between-group variations in student performance on the three SAT composites. African American applicants score consistently below average on all three composites, and there is little difference in the relative performance of these students on the SAT I, the SAT II composite with Writing and Math only, or the SAT II composite that includes the Third Test. American Indian applicants also score lower than average on all of the composites but tend to perform slightly worse relative to other students on the SAT II, both with and without the Third Test, than on the SAT I. White applicants, on the other hand, score higher than average on all three composites and tend to score highest on the SAT I. Finally, while Asian American applicants score better than average and Chicano/Latino worse than average on all three SAT composites, both groups score best on the SAT II composite that includes

[20] Students may take either the SAT II Mathematics Level IC or Level IIC tests to satisfy UC requirements. Although the Level IIC test assesses students' mastery of more advanced material than the Level IC, the tests are scaled in such a way that a student is neither advantaged or disadvantaged by choosing one exam over the other, according to the College Board, provided that the student has taken the appropriate coursework to prepare for the exam.

the Third Subject Test. The latter pattern undoubtedly reflects the influence of the language tests.

Table 10
Standardized Difference* in Mean SAT Scores by Race/Ethnicity:
Racial/Ethnic Group Means Compared to Mean for All Applicants
UC Fall 2000 Applicant Pool

Number of standard deviations that average scores for each racial/ethnic group are above (+) or below (-) the average for all applicants

	SAT I Verbal + Math	SAT II Writing + Math	SAT II Writing + Math + Third Test
African American	-.71	-.67	-.70
American Indian	-.10	-.17	-.24
Asian American	+.12	+.13	+.15
Chicano/Latino	-.66	-.62	-.34
White	+.18	+.16	+.08
Other/Unknown	-.01	-.01	-.06

* Standardized Difference = (Ethnic Group Mean - Mean for All Applicants) / Standard Deviation for All Applicants.

Notwithstanding these between-group differences, however, the overriding pattern that emerges from Table 10 is the striking *within-group similarities* in mean performance on the SAT I vs. SAT II, either with or without the Third Subject Test. African American applicants, for example, average -.71 standard deviations below the mean for all applicants on the SAT I, and -.70 standard deviations below the mean on the SAT II composite including the Third Test. Even among Chicano/Latino applicants, for whom the standardized difference is greatest (i.e., -.66 standard deviations on the SAT I vs. -.34 standard deviations on the SAT II composite with Third Test), the difference in mean performance is modest, approximately one-third of one standard deviation – or about 64 points on a 1600-point scale.

Test-score differences of this order of magnitude are too small to have any substantial effect on the demographic make-up of the UC admissions pool. To demonstrate, Table 11 (next page) compares the racial/ethnic composition of the top decile of UC applicants in Fall 2000 selected on the basis of same three SAT composites: SAT I math and verbal, SAT II with Writing and Math only, and SAT II with Writing, Math and the Third Subject Test. In considering the potential effects of these tests on admissions, it is important to examine not only differences in *mean* SAT scores among different racial/ethnic groups, but also differences at the high end of the SAT distribution, since there is an important distinction between eligibility for the University as a whole versus admissibility at the more selective UC campuses. Table 11 shows the demographic breakdown of the topmost portion of the UC applicant pool:

Table 11
Racial/Ethnic Composition of Top Decile of SAT I vs. SAT II Takers, Fall 2000 UC Applicant Pool

	SAT I Verbal + Math	SAT II Writing + Math	SAT II Writing + Math + Third Test
African American	0.7%	0.7%	0.6%
American Indian	0.3%	0.3%	0.2%
Asian American	41.4%	42.3%	45.0%
Chicano/Latino	2.5%	2.5%	3.0%
White	40.6%	40.2%	37.4%
Other/Unknown	14.5%	14.0%	13.7%
Total	100.0%	100.0%	100.0%

As this table illustrates, even among the most highly competitive applicants to the University, there are only small differences in the racial/ethnic composition of the top SAT I vs. the top SAT II takers – with or without the Third Subject test.[21] Moreover, because actual admissions decisions are based on high-school grades and many other factors in addition to test scores, the small differences shown here, which are based solely on test scores, are likely to be muted by other factors in practice. These data suggest that eliminating the SAT I in favor of the SAT II achievement tests would have only a marginal effect on the demographic composition of students admitted to the University, even at the most selective UC campuses.

Experience with UC's New Eligibility Index

But perhaps the best evidence of the potential impact of the SAT I vs. SAT II on different racial/ ethnic groups is provided by the University's actual experience this year in implementing its new Eligibility Index, which doubles the weight given to SAT II scores (including the Third Subject Test) over SAT I scores. The Eligibility Index is a sliding scale in which a low HSGPA can be offset by high test scores, and *vice versa*; the Index was originally introduced in the 1960s, and has been periodically updated in order to identify the top 12.5% statewide pool of California high school graduates as mandated by the state's Master Plan for Higher Education. Table 12 (next page) compares UC's previous Eligibility Index[22] with the new Index that was used for the first time this year as part of the Fall 2001 admissions cycle.[23]

[21]To compare the percentages in Table 11 with the *total* UC applicant pool, the racial/ethnic proportions among all UC applicants in Fall 2000 for whom SAT data were available were as follows: African American 3.6%, American Indian 0.6%, Asian American 29.3%, Chicano/Latino 12.4%, White 39.7%, Other/Unknown 14.5%.

[22] For reasons of brevity, Table 12 presents a simplified depiction of the previous Eligibility Index, which established SAT I minima at each *hundredth* of a grade-point between 2.82 and 3.30.

[23] The new Eligibility Index was developed to address a technical anomaly in the old Index: Under the old Index, all applicants were required to submit both SAT I (or ACT) and SAT II scores, but the scores were not actually used in calculating UC eligibility if a student had a sufficiently strong HSGPA. UC distinguishes between "eligibility" for the UC system as a whole and "admissions selection" at particular campuses, and while both SAT I (or ACT) and SAT II scores were used for purposes of admissions selection, how well students scored on these tests was irrelevant for

Table 12

Old UC Eligibility Index Prior to Fall 2001		New UC Eligibility Index Introduced Fall 2001	
HSGPA in UC-required Coursework	**SAT I (or ACT equivalent) Minimum Score**	**HSGPA in UC-required Coursework**	**SAT I (or ACT equivalent) + SAT II Weighted Minimum Score***
2.82	1600	2.80 - 2.84	4640
2.85	1570	2.85 - 2.89	4384
2.90	1490	2.90 - 2.94	4160
2.95	1370	2.95 - 2.99	3984
3.00	1270	3.00 - 3.04	3840
3.05	1170	3.05 - 3.09	3720
3.10	1070	3.10 - 3.14	3616
3.15	960	3.15 - 3.19	3512
3.20	840	3.20 - 3.24	3408
3.25	690	3.25 - 3.29	3320
3.30 and above	No minimum -- applicants required to submit SAT I and SAT II scores, but score values do not count toward UC eligibility	3.30 - 3.34	3248
		3.35 - 3.39	3192
		3.40 - 3.44	3152
		3.45 - 3.49	3128
		3.50 and above	3120

* Weighted test score = [SAT I composite] + [2 x (SAT II Writing + SAT II Mathematics + SAT II Third Subject test)].

Comparing the old and the new Eligibility Indices, three differences are noteworthy. First, SAT II scores are now combined along with SAT I scores in the Index. Second, there is a minimum combined test-score requirement at every HSGPA level, not just at the lowest HSGPA levels. Third, SAT II scores (including scores on the Third Subject Test) are given double the weight of SAT I scores in the Index calculation; BOARS' decision to double the weight for SAT II scores was based largely on the UC predictive validity findings mirrored in this paper (Kowarsky, Clatfelter and Widaman, 1998).[24] Note also that, because the total possible score on the SAT II with the Third Test is 2400, compared to 1600 on the SAT I, doubling students' SAT II scores in the eligibility calculation has the effect of *trebling* the maximum total points possible on the SAT II (4800) vs. the SAT I (1600) in the new Eligibility Index. Clearly the new Eligibility Index gives much greater emphasis to the SAT II, and if the SAT II does have a

purposes of eligibility if their HSGPA in UC-approved coursework was at least 3.30 – students needed only to take the tests. This circumstance prompted some state policymakers, including the Legislative Analyst's Office (LAO), to question whether UC's eligibility policies might be drawing from a larger pool of high school graduates than the 12.5% specified by the Master Plan; the larger pool included those students who had achieved at least a 3.30 HSGPA in UC-approved coursework and were "potentially eligible" for UC except for taking the required tests. LAO recommended, on this basis, deleting $35 million in "over-enrollment" funding from UC's budget in 1998-99. As a condition of maintaining those funds, UC agreed to revise its Eligibility Index, which was done under the leadership of BOARS. From the standpoint of state policy, the key features of the new Eligibility Index are that (1) it incorporates both SAT I (or ACT) and SAT II scores, and (2) there is a minimum combined test score requirement at every HSGPA level. These changes are designed to eliminate the category of students who could be considered "potentially eligible" for UC except for taking all of the required tests.

[24] BOARS and UCOP research staff also consulted closely with College Board research staff in determining the relative weights to be assigned to SAT I vs. SAT II scores, and the minimum combined SAT scores established for each HSGPA level within the new Eligibility Index were based on regression formulae provided by the College Board.

substantially different demographic footprint than the SAT I, then one might expect to observe this effect in UC's Fall 2001 applicant pool.

Yet the racial/ethnic distribution of students who are eligible for UC under the new Index is almost identical to the distribution produced by the old Index. Table 13 below was developed by applying the old Eligibility Index to the Fall 2001 applicant pool and comparing the results with those actually achieved using the new Index:

Table 13
Racial/Ethnic Distribution of UC-Eligible Students under Old vs. New Eligibility Index
Fall 2001 UC Applicant Pool

	Old Statewide Eligibility Index	New Statewide Eligibility Index*
African American	3.1%	3.1%
American Indian	0.6%	0.6%
Asian American	32.9%	32.7%
Chicano	10.6%	10.8%
Latino	3.4%	3.5%
White	39.5%	39.2%
Other	1.8%	1.8%
Unknown	8.2%	8.2%
Total	100.0%	100.0%

* Does not include students newly eligible under UC's Top 4% by School policy.

As Table 13 demonstrates, the racial/ethnic distributions are virtually the same under UC's old and new Eligibility Indices. Doubling the weight given to SAT II scores and extending test-score minima across all HSGPA levels has had almost no effect on the racial/ethnic composition of the pool of applicants eligible for UC under statewide eligibility criteria.[25]

Predictive Validity of the SAT II Third Subject Test

Finally, we present a surprising, if still preliminary, finding about the relative weight of the SAT II Third Subject Test itself in predicting student success at UC: After the SAT II Writing test, the SAT II Third Test is the next-best predictor of the five component tests that make up the SAT I and SAT II.

Table 14 (next page) shows the percentage of variance in UC freshman GPA explained by high school grades, SAT I scores and the three SAT II achievement tests required by

[25] Table 13 excludes students who did not meet statewide eligibility criteria, as determined by the Index, but who became eligible as the result of UC's new Eligibility in the Local Context (ELC) policy, which makes eligible the top 4% of students from each high school; ELC also took effect in Fall 2001.

UC: SAT II Writing, SAT II Mathematics, and the SAT II Third Subject Test. The findings are again based on the pool of freshmen entering UC between 1996 and 1999:

Table 14
Contribution of SAT II Third Subject Test to Explained Variance in UC Freshman GPA, 1996-1999

Prediction equations:	Percent of Variance Explained
(1) **HSGPA**	15.4%
(2) **HSGPA + SAT II M**	18.1%
(3) **HSGPA + SAT II Third Test**	19.0%
(4) **HSGPA + SAT II W**	21.8%
(5) **HSGPA + SAT II WM** (combined score on 2 tests)	21.5%
(6) **HSGPA + SAT II WM + SAT I**	21.7%
(7) **HSGPA + SAT II WM + SAT II Third Test**	22.2%

As shown in equations (1) through (4), after taking into account students' HSGPA (equation 1), entering the SAT II Third Test into the prediction equation (equation 3) adds more to the percentage of variance explained than the SAT II Mathematics test (equation 2), though less than the SAT II Writing (equation 4).

Equations (5) through (7) show that, after taking into account students' HSGPA and their combined score on the SAT II Writing and Mathematics tests (equation 5), entering the SAT II Third Test into the prediction equation (equation 7) adds more to the percentage of variance explained than the SAT I (equation 6).

In sum, the analysis of explained variance indicates that the SAT Third Test ranks behind only HSGPA and the SAT II Writing test, but ahead of the SAT II Mathematics test and the SAT I, in predicting UC freshman GPA.

The predictive power of the SAT II Third Test is also evident in the pattern of standardized regression coefficients shown in Table 15 (next page). This table presents the beta weights for HSGPA and each of the five SAT component tests within a combined regression equation (UCGPA = HSGPA + SAT I V + SAT I M + SAT II W + SAT II M + SAT II Third Test). Beta weights are shown both for the overall freshman pool (right-hand column) and by intended major disciplinary area:

Table 15
Standardized Regression Coefficients*
for HSGPA and SAT Component Tests
by Intended Major, 1996-1999

	General/ Undeclared	Social Sci/ Humanities	Biological Sciences	Physical Sci/Math/ Engineering	Overall
HSGPA	.27	.28	.31	.29	.27
SAT I Verbal	.06	.10	.04	-.06	.05
SAT I Math	.02**	.00**	.07	.02**	.01**
SAT II Writing	.18	.16	.10	.10	.18
SAT II Mathematics	.02**	.05	.14	.15	.02
SAT II Third Test	.08	.07	.10	.12	.09

* Prediction equation: UCGPA = HSGPA + SAT I V + SAT I M + SAT II W + SAT II M + SAT II 3rd
** Not statistically significant at <.01 level.

Looking first at the data for the overall freshman pool in the right-hand column of Table 15, the beta weights exhibit the same rank order among the predictor variables as observed previously in the explained-variance data in Table 14: The SAT II Third Test ranks behind only HSGPA and SAT II Writing scores, [26] but ahead of the SAT II Mathematics test and SAT I verbal and math scores, in terms of its predictive weight.

A more nuanced picture emerges when one examines the pattern of beta weights within different disciplinary areas in the body of Table 15. While HSGPA continues to have the greatest predictive weight in all disciplines, the relative weighting of the various SAT component tests varies across disciplines. The SAT II Writing test has the greatest predictive weight among General/Undeclared majors and students in the Social Sciences and Humanities but not, as might be expected, among students in the Biological and Physical Sciences, Mathematics and Engineering, for whom the SAT II Mathematics test is the best predictor of freshman grades. On the other hand, the SAT I test of mathematical reasoning is among the poorer predictors in all academic disciplines, even in the Physical Sciences, Mathematics and Engineering, where the standardized coefficient for the SAT I math test is not statistically significant within a regression equation that also includes the SAT II Mathematics and other component tests.

These variations notwithstanding, the main point of Table 15 is that, compared to the other SAT I and SAT II component tests, the SAT II Third Test is among the better predictors of student success in all major fields. Of the five component SAT tests required for UC admission, the SAT II Third Test ranks as the second-best predictor both among General/Undeclared majors (after the SAT II Writing) and among students in the Biological and Physical Sciences, Mathematics and Engineering (after the SAT II

[26] In view of the predictive superiority of the SAT II Writing test, it is interesting to note that this test is the only one of the five required SAT component tests that involves an actual performance element – writing – in addition to multiple-response items.

Mathematics), and as the third-best predictor within the Social Sciences and Humanities (after the SAT II Writing and the SAT I verbal).

Directions for Further Research

These findings must be regarded as preliminary, as more detailed analyses need to be conducted on the *particular* tests that applicants take to satisfy the Third Test requirement. Under UC policy, applicants may choose to submit results for any of the following SAT II achievement tests: Chinese, French, French with Listening, German, German with Listening, Modern Hebrew, Italian, Japanese, Korean, Latin, Spanish, Spanish with Listening, U.S. History, World History, Literature, Ecological Biology, Molecular Biology, Chemistry, and Physics. UCOP research staff has begun analyses of the predictive validity of each of the 19 tests, with appropriate statistical controls for major disciplinary area, race/ethnicity, socioeconomic background and, in the case of the language tests, first-language background. These analyses are essential to refine our understanding of why the SAT II Third Subject Test has predictive value as an admissions requirement. Analyses will be presented in a forthcoming paper.

Nevertheless, even before the results of that research are known, the fact remains that the Third Subject Test, as an elective admissions requirement, does have evident predictive value, both overall and within every major disciplinary area. And while unexpected, this finding is perhaps not so surprising in the final analysis, given the intended purpose of the Third Test requirement, namely, to allow students the opportunity to demonstrate their particular areas of academic strength. That those strengths correlate with later success at the University may not be surprising at all.

IV. Conclusions and Implications for Admissions Policy

The findings presented here have three main implications for admissions policy:

First, the UC data provide strong evidence that students' scores on the SAT II achievement tests are superior predictors of freshman grades than SAT I scores. If the prediction of college success as measured by freshman GPA is the standard by which admissions tests should be judged, as the College Board and others have emphasized in the vast majority of validity studies, then the SAT II achievement tests are the clear choice on this criterion, according to the UC data.

Second, our data indicate that the predictive validity of the SAT II is much less affected by differences in students' socioeconomic background than the SAT I: After controlling for socioeconomic factors, the predictive power of the SAT II is undiminished, while the relationship between the SAT I and UC freshman grades virtually disappears. These findings suggest that the SAT II is not only a better predictor, but also a fairer test in college admissions insofar as it is demonstrably less sensitive than the SAT I to differences in family income and parents' education.

Third, our findings with respect to the racial/ethnic impact of the SAT I vs. SAT II indicate that, in general, there are only minor differences between the tests. The SAT II is a slightly better predictor of freshmen grades for most racial/ethnic groups than the SAT I, but both tests tend to "over-predict" freshman grades for minority students to a small but measurable extent. And while there are large between-group differences in student performance on the SAT I and SAT II, the within-group differences are relatively small, both at the mean as well as at the high end of the test-score distribution. Including the Third Subject Test within the SAT II composite does produce modest test-score improvements for Chicano/Latino and Asian American students, but the improvements are too small to have any substantial effect on the demographic composition of the UC admissions pool. In sum, these findings suggest that eliminating the SAT I in favor of the SAT II -- with or without the Third Subject Test -- would have little effect on rates of UC eligibility and admission among students from different racial/ethnic groups. UC's experience this year with its new Eligibility Index, which doubles the weight given to SAT II scores, supports this conclusion.

The racial/ethnic dimension of the proposal to eliminate the SAT I in favor of achievement tests such as the SAT II has become a lightning rod for speculation and debate. Some, for example, view the SAT II Third Subject Test as giving an unfair "language advantage" for Chicano/Latino and Asian American students, on the grounds that it is inappropriate for native speakers of a language to take an achievement test in that same language. Others question why this rule should not also apply to native speakers of English. Still others view mastery of a second language, however acquired, as an important academic asset that students should be allowed to demonstrate. The debate reflects honest and deeply held differences in perspective and values, and such differences are unlikely to be resolved by data. The most that can be said at this point is, first, that racial/ethnic differences in performance on the SAT I and SAT II, with or

without the Third Subject Test, appear to be minor – though minor differences inevitably become magnified in debate – and second, that the Third Test, as an elective admissions requirement, does have evident predictive value, although further research is needed to understand the role of the language tests in this regard.

However, the role of the SAT II Third Subject Test may ultimately turn out to be a side issue in the movement toward curriculum-aligned, achievement-based testing at both the K-12 and college and university levels. If UC were to move to the SAT II, whether on a transitional or permanent basis, there are several options for utilizing the Third Test. The Third Test could, for example, be dropped from the SAT II composite entirely. Alternatively, UC might retain the Third Test requirement but either drop the language tests or set restrictions on the their use for meeting that requirement. Still another option would be for UC to increase the required number of SAT II achievement tests from three to five, aligning more closely with UC's "a-g" college-preparatory curriculum requirements and at the same time decreasing the weight of the elective subject test. From this perspective, the role of the SAT II Third Test is perhaps more properly regarded as a policy decision and not an essential feature of the broader initiative to expand use of achievement-based tests in college admissions and to link admissions testing more directly to the curriculum that students are taught in school.

The choice between the SAT I and the SAT II reflects a choice between two contrasting approaches to college admissions: An approach that emphasizes prediction of success in college based on tests of "the broader domains of math and verbal reasoning" (Caperton, 2001) as against an approach that emphasizes demonstrated mastery of specific academic subjects required for college-level work. The first attempts to assess students' aptitude for future learning in college, while the second evaluates students' present level of competence in college-preparatory subjects. It is a long-standing debate (Slack and Porter, 1980; Jackson, 1980; Crouse and Trusheim, 1988). Advocates of the SAT I argue that it taps generalized verbal and mathematical reasoning abilities needed for success in college, and that without the SAT I, admissions officers would make poorer decisions in predicting which students will succeed. Advocates of achievement tests counter that our ability to predict college outcomes is limited; even in combination with high-school grades, the SAT I accounts for only a fraction of the variance in the grades of college freshmen. They argue that, because achievement tests are linked more directly to the high-school curriculum, such tests provide clearer standards of what students must accomplish to be admitted to college and at the same time create incentives for educational improvement at the high-school level.

If the UC data add anything new to the long-standing debate over aptitude vs. achievement testing, it is this: Insofar as "aptitude" or "readiness for college" refer to tested competencies that bear a demonstrable relationship to freshman grades or other indicators of success in college, the SAT II performs better than the SAT I in identifying such competencies. The benefits of achievement tests with respect to the clarity and efficacy of admissions standards can be realized without any sacrifice in the capacity to predict success in college.

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